Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

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CMD: 22-H5

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Reference CMD(s)/CMD(s) de référence: 14-M60, 18-M38, 19-H6, 21-M34

A licence amendment

Cameco Corporation

Request for release of 18 Beaverlodge properties from requiring licensing under *the Nuclear Safety and Control Act*

Commission public hearing

Scheduled for:

March 23–24, 2022

Submitted by:

CNSC staff

Une modification de permis

Cameco Corporation

Demande de libération, pour 18 propriétés de Beaverlodge, de l'obligation de détenir un permis en vertu de la *Loi sur la sûreté et la réglementation nucléaires*

Audience publique de la Commission

Prévue pour :

Les 23 et 24 mars 2022

Soumise par :

Le personnel de la CCSN

e-Doc 6502001 (WORD)
e-Doc 6540868 (PDF)

Summary

This Commission member document presents information about the following matter of regulatory interest with respect to Cameco Corporation's Beaverlodge Project:

- application for removal of properties from the Beaverlodge waste facility operating licence WFOL-W5-2120.1/2023, to facilitate the transfer of properties to Saskatchewan's Institutional Control Program.

CNSC staff recommend the Commission take the following actions:

- amend Waste Facility Operating Licence WFOL-W5-2120.1/2023 to remove 18 properties from the figure within appendix A of the licence
- exempt the Government of Saskatchewan from licensing under the *Nuclear Safety and Control Act* for the 18 properties, or portions thereof, proposed for transfer into Saskatchewan's Institutional Control Program.

The following items are attached:

- current licence WFOL-W5-2120.1/2023
- proposed licence amendment
- proposed draft licence WFOL-W5-2120.2/2023
- proposed draft licence conditions handbook

Résumé

Ce document à l'intention des commissaires présente des informations sur la question d'intérêt réglementaire suivante en ce qui concerne le projet Beaverlodge de Cameco Corporation :

- demande de retrait de propriétés du permis d'exploitation d'une installation de gestion des déchets WFOL-W5-2120.1/2023 de Beaverlodge pour faciliter le transfert des propriétés au Programme de contrôle institutionnel de la Saskatchewan.

Le personnel de la CCSN recommande à la Commission de prendre les mesures suivantes :

- modifier le permis d'exploitation d'une installation de gestion des déchets WFOL-W5-2120.1/2023 afin d'enlever 18 propriétés se trouvant sur la figure de l'annexe A
- exempter le gouvernement de la Saskatchewan de l'obligation de détenir un permis en vertu de la *Loi sur la sûreté et la réglementation nucléaires* pour les 18 propriétés (ou des parties de celles-ci) dont le transfert au Programme de contrôle institutionnel de la Saskatchewan est proposé

Les pièces suivantes sont jointes :

- permis actuel WFOL-W5-2120.1/2023
- modification proposée au permis
- permis modifié proposé WFOL-W5-2120.2/2023
- manuel des conditions de permis proposé

Signed/Signé le

03 December 2021

Murthy, Kavita

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PLAIN LANGUAGE SUMMARY

The Beaverlodge mine and mill site is located in northwestern Saskatchewan, near Uranium City. The Beaverlodge site is situated within historic Treaty 8 (1899) and Homeland of the Métis and is within the traditional territories of the Dene, Cree, and Métis peoples. The site operated from 1952 to 1982. Clean-up and decommissioning began when the site closed in 1982 and decommissioning was completed in 1985. Cameco Corporation (Cameco), who is the operator (on behalf of the Government of Canada) has been monitoring the site and conducting work to enable the site to be transferred to the Government of Saskatchewan's Institutional Control Program (ICP). Originally, there were 70 separate properties on the Beaverlodge site area and, in 2009, 5 of these properties were removed from the licence issued by the Canadian Nuclear Safety Commission (CNSC) and transferred to the ICP. After a public hearing in 2019, the Commission released an additional 20 properties of which 19 properties were transferred to the ICP. One property did not require institutional control measures as there was no risk associated with the property, so it was not transferred to the ICP.

In 2021, Cameco requested an additional 18 of the remaining 45 properties be removed from the CNSC-issued licence. This Commission Member Document (CMD) presents CNSC staff's assessment and recommendations regarding Cameco's request for a licence amendment to remove 18 properties from its Waste Facility Operating Licence, WFOL-W5-2120.1/2023.

In order for a transfer to the ICP to happen, the CNSC, Saskatchewan Ministry of Environment and Saskatchewan Ministry of Energy and Resources must work together. The CNSC must be assured that the site is safe and expected to remain so in the long term. In order to make sure this takes place, the CNSC established site-specific conditions that must be met. These conditions are:

- gamma radiation levels are low (which will allow for traditional activities at the site)
- drilled boreholes created during mining and exploration have been sealed to prevent water from flowing out of them, preventing contamination of surface water
- openings to the underground mines have been durably sealed to prevent access and make them safe
- the sites have been cleaned and all rubbish has been removed
- the ground above the underground mines is stable and safe with very low risk of ground collapse
- water quality is expected to be stable and/or improve in the long term.

Prior to making a decision, the CNSC will hold a hearing in which the public can provide their written comments. Indigenous Nations and communities can provide oral presentations if they would like to.

This CMD prepared by CNSC staff along with a CMD from Cameco will be presented at the hearing. If the Commission grants Cameco's request and the properties are transferred to the ICP, the Government of Saskatchewan will manage any monitoring and maintenance and respond to any unforeseen events at the properties indefinitely.

If this request is approved, 27 properties will remain under Cameco's current licence and most of these properties are located in part of the tailings management area. Cameco has expressed its intent to have the remaining properties released from the CNSC licence as soon as feasible. This may be achievable prior to the licence renewal in 2023 or if not, in either 2024 or 2025, for which Cameco may request a short licence extension.

Referenced documents in this CMD are available to the public upon request.

EXECUTIVE SUMMARY

The decommissioned Beaverlodge mine and mill site is located in northwestern Saskatchewan, approximately 8 kilometres from Uranium City. The Beaverlodge site is situated within historic Treaty 8 (1899) and Homeland of the Métis and is within the traditional territories of the Dene, Cree, and Métis peoples. The site operated from 1952 to 1982 and decommissioning was completed in 1985. Comprising originally of 70 separate properties, the site has been in a state of post decommissioning monitoring since decommissioning was completed.

The process to transfer decommissioned Beaverlodge properties to the Government of Saskatchewan's Institutional Control Program (ICP) was initiated in 2009. Later in 2009, the Commission granted an exemption from licensing with respect to 5 of the Beaverlodge properties, which were then transferred to the ICP. In October 2018 Canadian Nuclear Safety Commission (CNSC) staff provided the Commission with a technical briefing outlining the ICP. In 2019, the Commission granted a release of 20 properties from Waste Facility Operating Licence WFOL-W5-2120.0/2023 of which 19 properties, or portions thereof, were transferred to the ICP. One property did not require institutional control measures as there was no risk associated with the property.

In 2021, Cameco Corporation (Cameco) applied for a licence amendment to remove an additional 18 of the remaining 45 properties from their CNSC-issued licence. This Commission Member Document (CMD) presents CNSC staff's assessment and recommendations regarding Cameco's application for a licence amendment to remove 18 properties from its Waste Facility Operating Licence, WFOL-W5-2120.1/2023.

Saskatchewan's provincial regulations establishing the ICP requires that the Government of Saskatchewan be exempt from licensing under the *Nuclear Safety and Control Act* (NSCA) in relation to any properties entering the program. If the Commission accepts Cameco's application to remove the 18 properties from its licence in order to enable a transfer to the ICP, an exemption by the Commission under section 7 of the NSCA for the Government of Saskatchewan would also be needed. Once these properties enter the program, the Government of Saskatchewan will manage any monitoring and maintenance and respond to any unforeseen events.

The Government of Saskatchewan's ICP is designed to ensure that the properties in the program are monitored and managed in perpetuity. Cameco has provided documentation in support of the licence amendment request. Staff from both the CNSC and the Government of Saskatchewan have confirmed the performance objectives and criteria established for these Beaverlodge properties have been achieved. The sites are safe and will remain so in the long term under the ICP.

Upon approval of the licence amendment, 27 properties will remain under the proposed CNSC licence issued to Cameco. Cameco has expressed its intent to have the remaining properties released from the CNSC licence as soon as feasible. This may be achievable prior to the licence renewal in 2023 or if not, in either 2024 or 2025, for which Cameco may request a short licence extension.

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.1/2023 to remove 18 properties from the figure within appendix A of the licence; and
- exempt the Government of Saskatchewan from licensing under the *Nuclear Safety and Control Act* for the 18 properties, or portions thereof, proposed for transfer into Saskatchewan's Institutional Control Program.

Documents referenced in this CMD are available to the public upon request.

PART ONE

This Commission Member Document (CMD) is presented in two parts.

Part One includes:

1. An overview of the matter being presented
2. Overall conclusions and overall recommendations
3. Property by property summary
4. Information regarding the performance indicators and regulatory acceptance criteria
5. Discussion about other matters of regulatory interest
6. Addenda material that complements items 1 through 5.

PART TWO

Part Two provides all available information pertaining directly to the current and proposed licence:

1. The current waste facility operating licence
2. Proposed licence amendment
3. The proposed draft waste facility operating licence
4. The proposed draft Licence Conditions Handbook.

1. OVERVIEW

1.1 Background

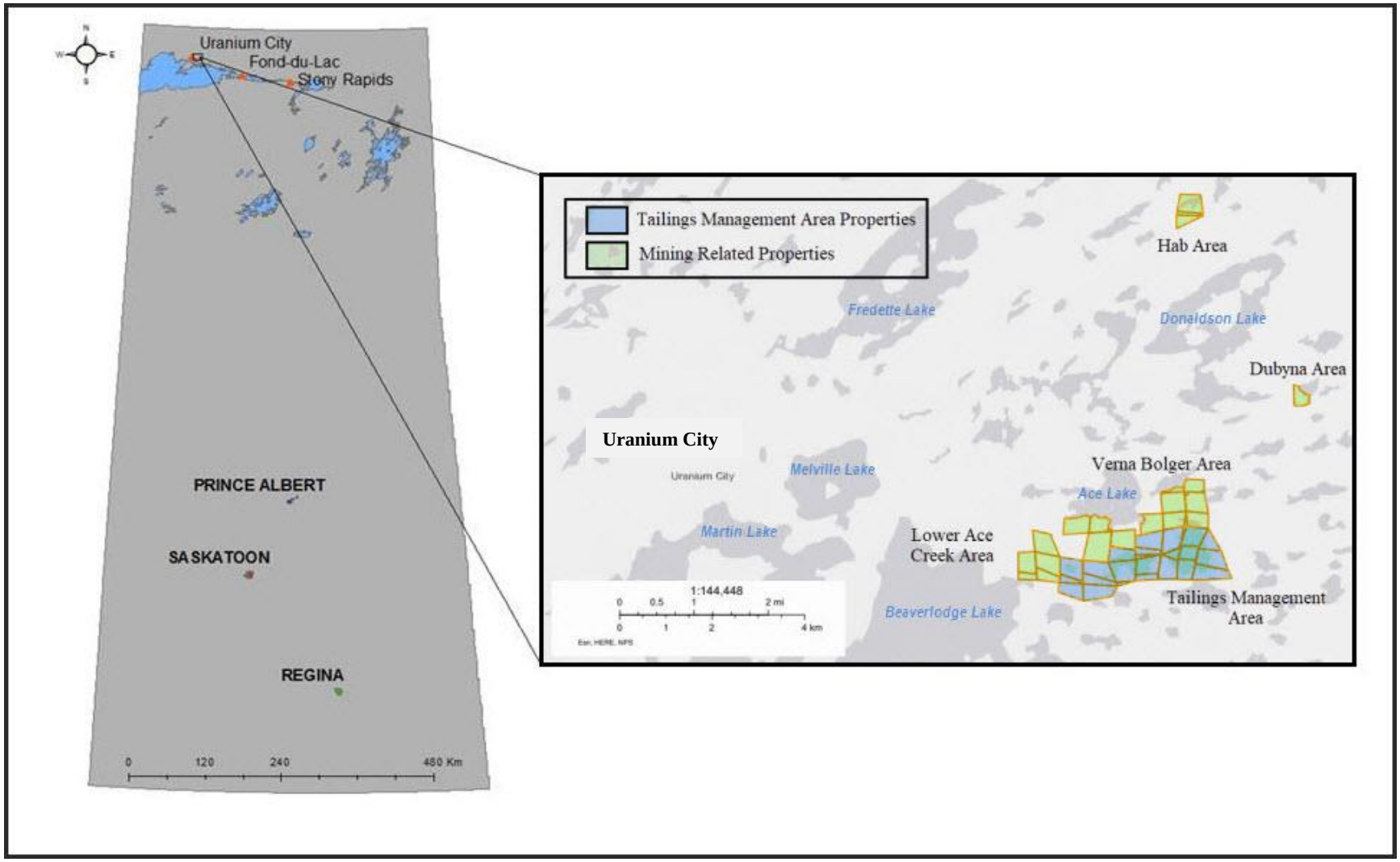
The decommissioned Beaverlodge mine and mill site is located in northwestern Saskatchewan, approximately 8 kilometres from Uranium City, as shown in figure 1.1. The Beaverlodge licensed areas are outlined with an orange line. Historical mining activities in these areas were conducted primarily within 2 watersheds: the Ace Creek Watershed and the Fulton Creek Watershed. Both of these watersheds feed into Beaverlodge Lake.

Eldorado Nuclear Limited, a federal Crown corporation, operated the Beaverlodge Project site from 1952 to 1982. Decommissioning was completed in 1985 following the decommissioning plan. The plan had been approved by the Joint Regulatory Group (JRG). The JRG comprises government organizations currently known as Environment and Climate Change Canada, Fisheries and Oceans Canada, Saskatchewan Ministry of Environment and the Canadian Nuclear Safety Commission (CNSC). The approved plan stated that the site water quality and vegetation were expected to recover naturally in the long term.

In 1988, Eldorado Nuclear Limited and the Saskatchewan Mining and Development Corporation, a provincial Crown corporation, merged to form Cameco Corporation (Cameco). As a result of this merger, Cameco was assigned the responsibility of maintaining and monitoring of the Beaverlodge site. Canada Eldor Inc., a subsidiary of the federal Crown corporation, Canada Development Investment Corporation, was to provide the funding for all site activities. Cameco holds the licence issued by the CNSC and is being financed by Canada Eldor Inc. to manage the site.

With the coming into force of the *Nuclear Safety and Control Act* (NSCA) in 2000, CNSC staff requested that Cameco provide historical and updated monitoring data regarding potential impacts to human health and waterbodies at the Beaverlodge site. Based on the reports provided by Cameco, CNSC staff concluded that there were impacts to the waterbodies from historical practices, however, public health was adequately protected through fish and water consumption advisories. The CNSC requested Cameco to complete a detailed assessment from 2009 through to 2013 of the potential options that could advance the environmental recovery and remediation efforts in the Beaverlodge area waterbodies.

Figure 1.1: Beaverlodge Project - location map



Source: Cameco

To create a remediation plan, Cameco developed a Quantitative Site Model (QSM) to characterize the interaction between the properties and the downstream receiving environments through source characterization and dispersion modelling. The QSM was built using previous geochemical and pathways modelling efforts and integrated the source contributions from all properties into a single comprehensive model. The model was used to predict the long term natural recovery of select waterbodies, the expected environmental benefit of the remedial options, and to assess the cost benefit of the potential remedial options. Cameco completed over 20 studies which have contributed to the development of a path forward. This remediation plan was presented to the Commission at the licence renewal hearing in April 2013; the Commission concluded the licensee identified reasonable options to support the natural recovery of the site [1, 2]. The selected remediation options were expected to result in localized improvements in water quality. However, due to the type of historical mining practices and legacy impacts associated with the operation of the facilities, the results of the studies showed that with the implementation of all the practical remedial options assessed, there was little effect on the enhanced recovery of Beaverlodge Lake, which contained elevated levels of selenium and uranium.

On May 27, 2013, the Commission accepted the path forward and issued Cameco a 10-year licence to proceed with the remedial work and continued management of the properties [2]. During the 2013 hearing, CNSC staff committed to providing additional information on the following items:

- defined performance objectives and actual performance indicators for each property
- property-by-property timeline estimates for institutional control transfer eligibility.

Cameco developed and provided the information on performance objectives, indicators and timeline estimates in April of 2014 which was reviewed and accepted by CNSC staff. This information was summarized within Commission Member Document (CMD) 14-M60 [3] and presented to the Commission on October 1, 2014, fulfilling the commitment made by staff.

The broad performance objectives for the decommissioned Beaverlodge site, as outlined in CMD 14-M60, have been defined as safe, secure, and stable/improving. There are actual performance indicators and regulatory acceptance criteria which have been established to ensure that these performance objectives are met, as described in section 2 of this CMD.

Cameco outlined a proposed schedule for submissions in support of their application to transfer all Beaverlodge properties into either the Institutional Control Program (ICP) or for releasing properties, or portions thereof, from licensing over their current 10-year licensing period. As the land owner and manager of the ICP, the Government of Saskatchewan has identified the areas of the Beaverlodge site that will require transfer to the ICP, and areas that can be released from licensing and transferred to the province’s management without institutional control restrictions.

The process to transfer decommissioned Beaverlodge properties to the Government of Saskatchewan's ICP was initiated in 2009 when the Commission granted Cameco an exemption from licensing with respect to 5 of the Beaverlodge properties. These 5 properties were transferred to the ICP. In 2019, the Commission granted a release of 20 properties from Waste Facility Operating Licence WFOL-W5-2120.0/2023 of which 19 properties, or portions thereof, were transferred to the ICP. One property did not require institutional control measures as there was no risk associated with the property. CNSC staff submitted CMD 19-H6 [4] and the Commission's Record of Decision [5] was issued on December 19, 2019.

In 2021, Cameco applied for a licence amendment to remove an additional 18 of the remaining 45 properties from their CNSC-issued licence. This CMD presents CNSC staff's assessment and recommendations regarding Cameco's application for a licence amendment to remove these 18 properties from its current Waste Facility Operating Licence, WFOL-W5-2120.1/2023.

1.2 ICP Overview, Release and Transfer Process

An overview of the ICP and transfer process was presented on October 3, 2018, by CNSC staff to Commission members in CMD 18-M38 [6]. Pertinent information from the ICP CMD has been included within this section along with a summary of the release and ICP transfer process in order to provide information relevant to Cameco's current application.

1.2.1 ICP Overview

Established in 2007 by the Government of Saskatchewan, the ICP implements the process for the long term monitoring and maintenance of former mine/mill sites located on provincial Crown land. This process occurs after mining/milling activities have ended, decommissioning has been completed, and post closure monitoring has demonstrated the site is safe and stable. Sufficient funds must also be provided by the property holder for long term monitoring and maintenance and for unforeseen events.

The Government of Saskatchewan states that the primary objectives of the ICP are to:

- protect human health and safety
- protect the environment
- ensure future generations are not burdened with the costs of long term monitoring and maintenance for current mining development
- be sustainable
- recognize federal jurisdiction, regulatory roles and responsibilities for national and international obligations.

With respect to former uranium mine/mill properties, the Government of Saskatchewan has crafted the ICP with a view of Canada's obligations under the *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* (Joint Convention) [7]. Under the Joint Convention, to which Canada is a signatory, institutional measures with respect to record-keeping, monitoring and access control may be required. The ICP satisfies this convention as well as other relevant international recommendations and guidance, as outlined in CMD 18-M38 [6].

Operation of the ICP, including monitoring and maintenance, is by the Saskatchewan Ministry of Energy and Resources (SMER). According to provincial regulations, the licensee requesting the transfer of properties from their oversight to provincial oversight under the ICP must provide the province with sufficient funds to conduct long term monitoring and maintenance and financial assurance to address unforeseen events. This requirement is separate from the financial guarantees required by the Commission. The requirement to have funds for monitoring, maintenance and unforeseen events as a condition of entry into the ICP ensures that sufficient funds are readily available to carry out any necessary work on the properties.

When a decommissioned and reclaimed uranium mine/mill site enters the ICP, the province will be responsible for the long term oversight and maintenance of the property. The CNSC would no longer exercise regulatory oversight by virtue of the exemption from the application of the NSCA.

The primary components of the ICP are the Institutional Control Registry (Registry) and 2 Institutional Control funds: the Institutional Control Monitoring and Maintenance Fund (ICMMF) and the Institutional Control Unforeseen Events Fund (ICUEF).

The ICP Registry includes the maintenance of records, including:

- location of closed property/site
- description of former operator(s)
- site description
- historical records of activities
- description of the site monitoring and maintenance obligations
- description of surface land use and mineral disposition restrictions.

The ICMMF is for future monitoring and maintenance costs in perpetuity. The monies in this fund can only be used for monitoring and maintenance of the closed property to which that account is associated.

The ICUEF is for costs of unforeseen events. This fund is for any maintenance obligation, including the determination of maintenance costs that were not covered by the ICMMF.

These 2 institutional control funds, provided by the property holder to the province, will replace the financial guarantee required by the CNSC once the property holder/licensee is released from regulatory oversight by the Commission. Through this approach, assurance is maintained that sufficient funds are available to carry out any necessary work on behalf of the site-holder/licensee.

Because there are very few properties currently in the ICP, SMER has temporarily implemented a licensee-backed financial assurance requirement for the ICUEF. The financial assurance requirement has been implemented and will remain in place until the province determines that there are sufficient funds available in the ICUEF to manage the total costs for unforeseen events. This measure is to minimize the ICP's financial risk. The assurance amount is based on the cost of a maximum failure event at a site and can only be used for the site for which it was established. The maximum failure event will depend on the residual structures and risks at a site. For example, at a mine site, the event could be the premature failure of a shaft cap whereas for a mill site, it could be the repair of a tailings dam or cover due to an extreme rainfall event. It is the SMER's intent to return unused financial assurance once the ICUEF has reached a sufficient amount.

Payment of both the ICMMF and ICUEF are made by the site holder who requested the transfer into the ICP. The 2 funds are completely separate from the financial guarantees/assurances that were in place during mine/mill operations to ensure proper decommissioning, reclamation and closure. The ICMMF and ICUEF amounts do not require approval by the Commission. Operation of the ICP, including monitoring and maintenance, is managed by the SMER.

A well-structured, informed, and sustainable program must be in place to ensure future safety and financial surety for a successful ICP. The Government of Saskatchewan has implemented such a program and manages the long term monitoring and maintenance for uranium mine/mill sites within the ICP.

The ICP is effective in ensuring that properties accepted into the program are safe, secure and stable, and will not:

- pose an unreasonable risk to the environment or the health and safety of persons
- pose an unreasonable risk to national security
- result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.

The ICP ensures that properties in the program will continue to meet the above-noted requirements in the long term through monitoring and maintenance of the properties as well as land use controls. The ICP provides assurance to the Commission that the process for the release of properties from licensing and the granting of exemptions are conducted in accordance with the requirements specified in the NSCA and associated regulations.

1.2.2 Release and Transfer Process

Under the NSCA, upon closure and completion of decommissioning, release of CNSC-licensed properties, or portions thereof, from federal regulatory oversight (licensing) may occur through different mechanisms. This will be determined by activities which have occurred at the site, the inventory of nuclear substances and residual risks, and the monitoring and management requirements. The types of legislative mechanisms will depend on the following characteristics of the property:

- undisturbed areas (i.e., undeveloped areas within the surface lease boundary)
- remediated areas that have an inventory of nuclear substances below exemption quantities/clearance levels, in accordance with section 5.1(1) of the *Nuclear Substances and Radiation Devices Regulations* (example: camp sites that have been reclaimed)
- remediated areas that have an inventory of nuclear substances below exemption quantities/clearance levels and have residual risks, such as the presence of hazardous substances (example: mines with shallow crown pillars and/or mine openings)
- remediated areas where radioactive materials in excess of exemption quantities/clearance levels are present which require institutional control (i.e., tailings management facility).

Undisturbed and remediated areas that have an inventory of nuclear substances below exemption quantities/clearance levels and that do not require institutional control would not require a licence under the NSCA. Therefore, these areas do not require an exemption from a licensing requirement. Thus, it can be said that it is "by operation of law" that these areas can be free-released, as they do not require a licence under the NSCA.

Areas that have quantities of nuclear substances above exemption quantities/clearance levels, and that need institutional control, would require a release from CNSC licensing and an exemption for the Government of Saskatchewan in order for them to be transferred into the ICP.

A condition of acceptance by the Government of Saskatchewan to transfer properties/sites into the ICP is that closed uranium mine/mill properties receive a release from any and all Government of Canada issued licences including those issued by the CNSC pursuant to the NSCA, thus reverting total custodial responsibility back to the province. The Commission has the authority to grant an exemption from the application of the NSCA pursuant to section 7 of the NSCA.

Section 11 of the *General Nuclear Safety and Control Regulations* provides that *the Commission may grant an exemption from licensing if doing so will not*

(a) pose an unreasonable risk to the environment or the health and safety of persons;

(b) pose an unreasonable risk to national security; or

(c) result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.

There is a well-defined process to be followed when properties, or portions thereof, are to be released from licensing and exemptions granted in order to transfer properties to the ICP. The process, as related to the current request from Cameco, is summarized below.

Application and review of release request

In order to transfer a property into the ICP, Cameco must first submit an application to the CNSC and provincial government. It is then required that this application is reviewed by staff from both the CNSC and the Government of Saskatchewan. The Saskatchewan Ministry of Environment (SMOE) and the SMER are the primary provincial agencies involved in any transfers of properties to the ICP.

Staff from both CNSC and the Government of Saskatchewan must agree that the application meets the established criteria. If these criteria are met, CNSC staff will recommend that the Commission release the properties from CNSC licensing and exempt the Government of Saskatchewan from licensing under the NSCA.

Province signifies properties can be transferred to the ICP

If the application is acceptable, SMOE will issue a letter of intent to grant a *Release from Decommissioning and Reclamation* to the licensee. SMER will also confirm that the properties proposed are all eligible for transfer to the ICP. Both of these provincial agencies require that the Commission release these properties, or portions thereof, from licensing.

CNSC releases site and grants exemption

Once the province has confirmed that the properties are eligible for transfer to the ICP, a Commission decision is required. The properties must be released from the current CNSC licence and the Government of Saskatchewan must be exempted from licensing under the NSCA in order for the properties to be transferred into the ICP.

Transfer of properties to the ICP

The licensee receives approval from the Government of Saskatchewan for the properties to be added to the ICP Registry. As part of the process, the properties are removed from the provincial surface lease and the mineral rights are surrendered. Funds must also be provided for the long-term monitoring and maintenance of the properties, as well as funds to address any unforeseen events.

Long term monitoring and management

The Government of Saskatchewan maintains sole regulatory authority and manages the administrative controls over the properties as well as the monitoring and maintenance requirements.

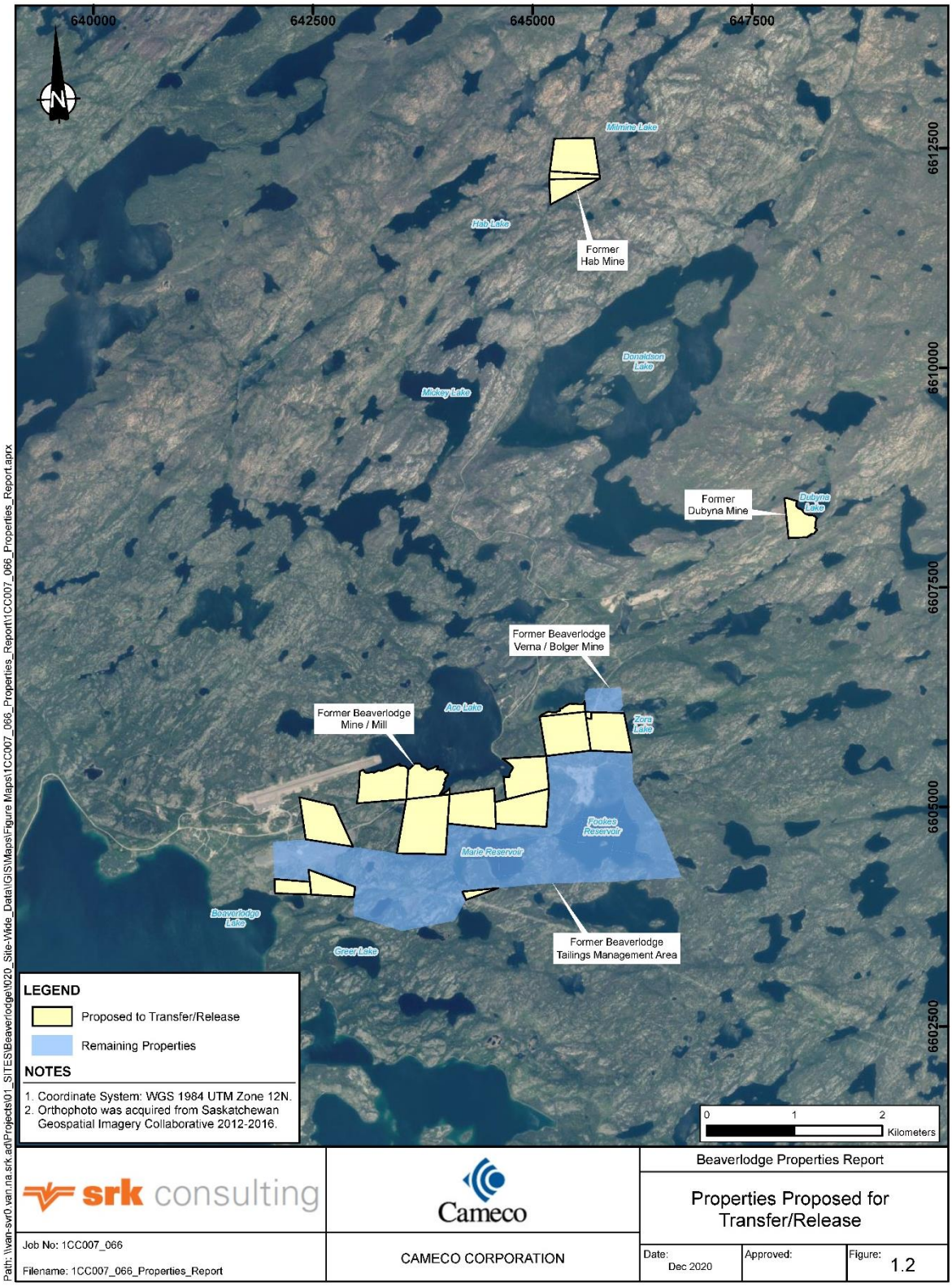
1.3 Current Request

Cameco submitted a closure report in January 2021 [8] proposing the release of 18 properties at the Beaverlodge site from CNSC licensing and subsequently transfer of the properties, or portions thereof, to the ICP.

Outlined within this closure report, Cameco and representatives from SMOE and SMER determined which portions of each property would and would not require institutional control. Properties not requiring institutional control were not disturbed by mining, nor pose any risk. CNSC staff have no concerns with the proposed institutional control boundaries for the Beaverlodge site. The adequacy of the closure report has been confirmed by CNSC staff and the Government of Saskatchewan.

Cameco subsequently submitted the application [9] to the Commission on July 14, 2021, in order to amend the existing Beaverlodge licence to release the 18 properties from the licensing (figure 1.2).

Figure 1.2: Beaverlodge Project – areas requested for release



1.4 Highlights

Cameco submitted an application [9] for an amendment to its licence to release 18 Beaverlodge properties from CNSC licensing and subsequently transfer the properties, or portions thereof, to the ICP. In support of the application, a closure report was submitted in January 2021 [8] with information on each property and a comparison of each property to the established performance indicators for Beaverlodge. These performance indicators and regulatory acceptance criteria were proposed by Cameco, reviewed and accepted by CNSC staff, and presented to the Commission on October 1, 2014 within CMD 14-M60 [3].

CNSC staff completed their technical review and evaluation of Cameco's request and agree that the properties meet the regulatory criteria for consideration by the Commission to release the properties from the CNSC licence. All 18 properties meet the performance indicators and regulatory acceptance criteria applicable to each property, as described in section 2.

According to section 3(f) of *The Reclaimed Industrial Sites Regulations*, an exemption is required for the province before properties can be transferred into the ICP. In order to allow the properties, or portions thereof to enter into the ICP, CNSC staff request that the Government of Saskatchewan be given an exemption from licensing under the NSCA. Authority to exempt comes from section 7 of the NSCA which states:

> *The Commission may, in accordance with the regulations, exempt any activity, person, class of person or quantity of a nuclear substance, temporarily or permanently, from the application of this Act or the regulations or any provision thereof.*

The conditions under which the Commission may grant an exemption pursuant to section 11 of the *General Nuclear Safety and Control Regulations* state:

For the purpose of section 7 of the Act, the Commission may grant an exemption if doing so will not

- *(a) pose an unreasonable risk to the environment or the health and safety of persons;*
- *(b) pose an unreasonable risk to national security; or*
- *(c) result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.*

SMOE issued a letter of intent on August 30, 2021 [10] indicating that the ministry is prepared to grant a *Release from Decommissioning and Reclamation* in accordance with section 22 of *The Mineral Industry Environmental Protection Regulations, 1996*. SMER confirmed on July 8, 2021 [11] that the properties proposed for transfer to the ICP are all eligible subject to the Commission releasing these properties, or portions thereof from licensing. Release of the properties from the CNSC licence and issuance of an exemption of the province from licensing of these properties under the NSCA is the next required step in the ICP transfer process. This CMD has been prepared in support of this request.

1.5 Overall Conclusions

Cameco submitted a request to have 18 properties released from CNSC licensing. Cameco has stated that all properties meet the performance objectives for the decommissioned Beaverlodge site: safe, secure, and stable/improving. The performance indicators and regulatory acceptance criteria which were defined to ensure these performance objectives are met have also been achieved. This information is explained in greater detail in section 2 of this CMD. CNSC staff agree that the applicable indicators and criteria have been achieved for these 18 properties.

CNSC staff have completed their technical review of Cameco's submitted documentation and concur with the request to release the properties from the CNSC licence. According to section 3(f) of *The Reclaimed Industrial Sites Regulations*, an exemption to hold a licence from the CNSC is required before properties can be transferred into the ICP.

Table 3.1 in section 3 of this CMD lists the 18 properties under request for release, and clearly denotes that all properties meet the applicable performance indicators and criteria accepted by the Commission in order for the sites to be released. The performance indicators and criteria established and accepted by the CNSC in order to allow the release of properties from CNSC licensing are provided in section 2 of this CMD.

CNSC staff have verified that the 18 properties proposed for exemption are all safe and will remain so in perpetuity, as they will continue to be monitored and maintained under the ICP. The Government of Saskatchewan crafted the ICP with a view of Canada's international obligations as described in section 1.2.

The properties' risk to the environment and the health and safety of persons is low, as demonstrated by achievement of the performance indicators and regulatory acceptance criteria. The Government of Saskatchewan's ICP, which was established in accordance with Canada's international obligations [7], ensures that any risks to the environment and the health and safety of persons will be managed in the future. The Government of Saskatchewan is a competent authority to monitor and manage these properties in perpetuity. National security is expected to continue to be maintained due to the remoteness of the site, lack of an inventory of nuclear substances and the land use restrictions placed on the properties within the ICP.

An Environmental Protection Review under the NSCA was conducted for this application as described in section 3.6 of this CMD. CNSC staff concluded that there has been, and will continue to be, adequate provision for the protection of the environment as a result of the release of these properties from licensing under the NSCA and the transfer of the properties to the Government of Saskatchewan's ICP.

1.6 Overall Recommendations

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.1/2023 to remove 18 properties from the figure within appendix A of the licence
- exempt the Government of Saskatchewan from licensing under the *Nuclear Safety and Control Act* for the 18 properties proposed for transfer into Saskatchewan's Institutional Control Program.

The 18 properties under request for exemption and release are the HAB 1, EXC 1, HAB 2, EMAR 1, ACE 7, ACE 8, NW 3 Ext, NW 3, ACE 3, ACE 14, ACE MC, ACE 9, ACE 1, URA 4, EXC URA 7, URA FR, GC 2 and EXC ACE 15.

2. PERFORMANCE OBJECTIVES AND INDICATORS

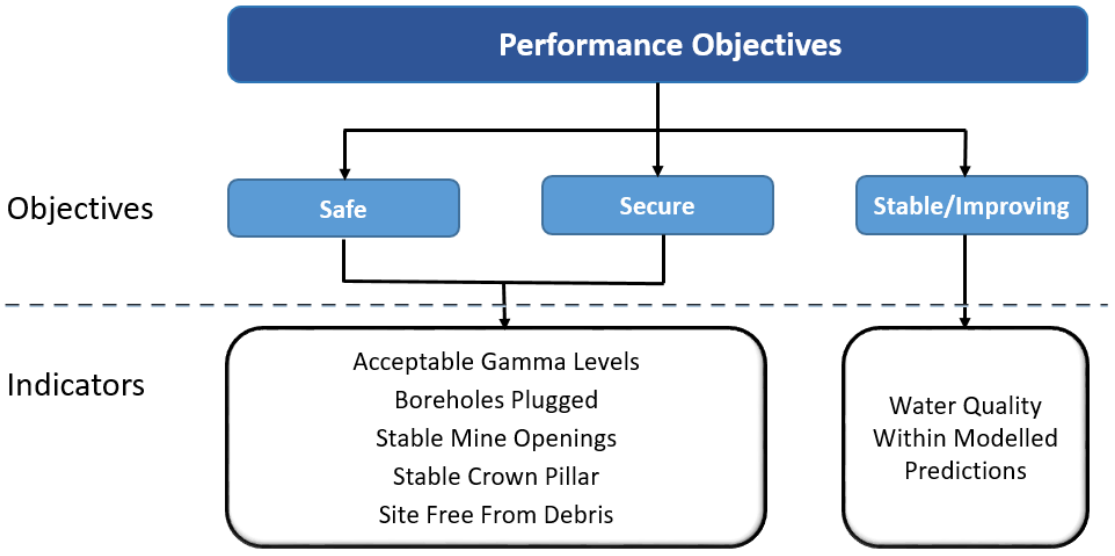
During the licence renewal in 2013, the Commission requested that CNSC staff provide further clarification on the performance objectives and actual performance indicators for the decommissioned Beaverlodge site [2]. This requested information was provided in CMD 14-M60 [3] which was presented to the Commission on October 1, 2014 and is provided in this section.

The following definitions are used to evaluate the properties at the Beaverlodge site:

- **Performance Objectives:** The objectives for all Beaverlodge licensed properties are that they be safe, secure, and stable/improving.
  - *Safe* - The site is safe for general public access. This objective is to ensure that the long term safety is maintained.
  - *Secure* - There must be confidence that long term risks have been assessed by a qualified person and are acceptable.
  - *Stable/Improving* - Environmental conditions (e.g. water quality) on and downstream of the decommissioned properties are stable and continue to naturally recover as predicted.
- **Performance Indicators:** Defined indicators used to verify that the performance objectives are being met.

The performance indicators used to determine if a site is safe and secure are shown on figure 2.1 and described in further detail in table 2.1.

Figure 2.1: Performance objectives and indicators



Further explanation on the performance indicators and the criteria to satisfy them are presented in table 2.1. The 2021 status of the performance indicators are provided in italics within the table.

Table 2.1: Performance indicators and criteria

Performance Indicators	Description	Regulatory Acceptance Criteria
Acceptable Gamma Levels	*2014 Description:* Cameco will complete a site-wide gamma survey which will indicate where additional material may need to be applied to cover existing waste rock or tailings. Following the application of the cover material, a final survey will be completed of the remediated areas verifying that the cover was adequate. *2021 Status: Site wide gamma scan completed and report submitted to CNSC in 2014* [12]. *Beaverlodge site gamma radiation risk evaluation report submitted to CNSC in 2015* [13]. *Disturbed areas were scanned using a 10 m grid (approximately), as terrain and vegetation allowed considering safety and physical accessibility. Both reports were accepted by CNSC staff in 2015 after responses to CNSC comments were addressed.*	Reasonable use scenario demonstrating gamma levels at the site are acceptable.
Boreholes Plugged	*2014 Description:* Cameco will plug all identified boreholes on the site to prevent groundwater outflow to the surface. *2021 Status: All boreholes identified to date have been sealed.*	All boreholes have been plugged at the time of transfer to institutional control.
Stable Mine Openings	*2014 Description:* The current concrete caps on the vertical mine openings will all be replaced with new engineered caps with established designs to improve the long term safety of the site. *2021 Status: Installation of stainless steel caps initiated in 2016 and all cap installations completed in 2020.* *For completeness, CNSC staff and Cameco agreed in 2019 to expand the performance indicator and acceptance criteria to include all mine openings and reword the performance indicator to Stable Mine Openings.*	Mine openings have been secured and signed off by a qualified person, where applicable.
Stable Crown Pillar	*2014 Description:* Based on the surface subsidence in the Lower Ace Creek area, a crown pillar assessment will be completed for the 4 areas that have mine workings close to surface including HAB, Dubyna, Verna/Bolger, and Lower Ace Creek. Cameco will complete the crown pillar assessment in 2014. If additional remediation is required, the work will be completed in 2015. *2021 Status: Crown pillar assessment completed in 2014 and report submitted in 2015 [14]. Report accepted by CNSC staff in 2016 once comments were addressed.*	Crown pillar assessed, remediated (if required), and signed off by a qualified person.

Performance Indicators	Description	Regulatory Acceptance Criteria
Site Free From Debris	*2014 Description:* Inspection and removal of any residual debris will be completed prior to exempting the properties from CNSC licensing and accepting them into the provincial Institutional Control Program. *2021 Status: Closure report submitted [8] in support of release and/or exemption from licensing describe debris removal efforts and provide visual evidence of the inspection efforts.*	Site free of former mining debris at the time of transfer to institutional control.
Water Quality Within Modelled Predictions	*2014 Description:* Trends established from past and future water monitoring will be compared to modelled predictions to verify: 1. that remedial options expected to result in localized improvements are having the desired effects and, 2. that natural recovery on and downstream of the decommissioned properties is continuing as predicted. *2021 Status: Reports submitted annually by Cameco which compare water quality with modelled predictions. In response to a request from CNSC staff, Cameco submitted a model update and Environmental Risk Assessment report in September 2020 [15]. The report included updated modelling inputs into a new modelling framework which allowed for a fully probabilistic assessment. The environmental performance indicators were also updated accordingly. CNSC staff have accepted conclusions from the report and the updated indicators.*	Water quality data is stable/improving.

Note: Refer to the glossary within this CMD for definitions of the mining terminology in this table.

Applicable waterbodies can be considered stable/improving when the water quality monitoring data trends are within the range of upper and lower bounds on the predictions. Realistic high and low values of the model assumptions were used to generate the range of upper and lower bounds. If the results are found to be within the predicted range or lower, they will be considered stable/improving. If the monitoring data trends fall above the predicted range, CNSC staff will require Cameco to complete a reassessment of the risk.

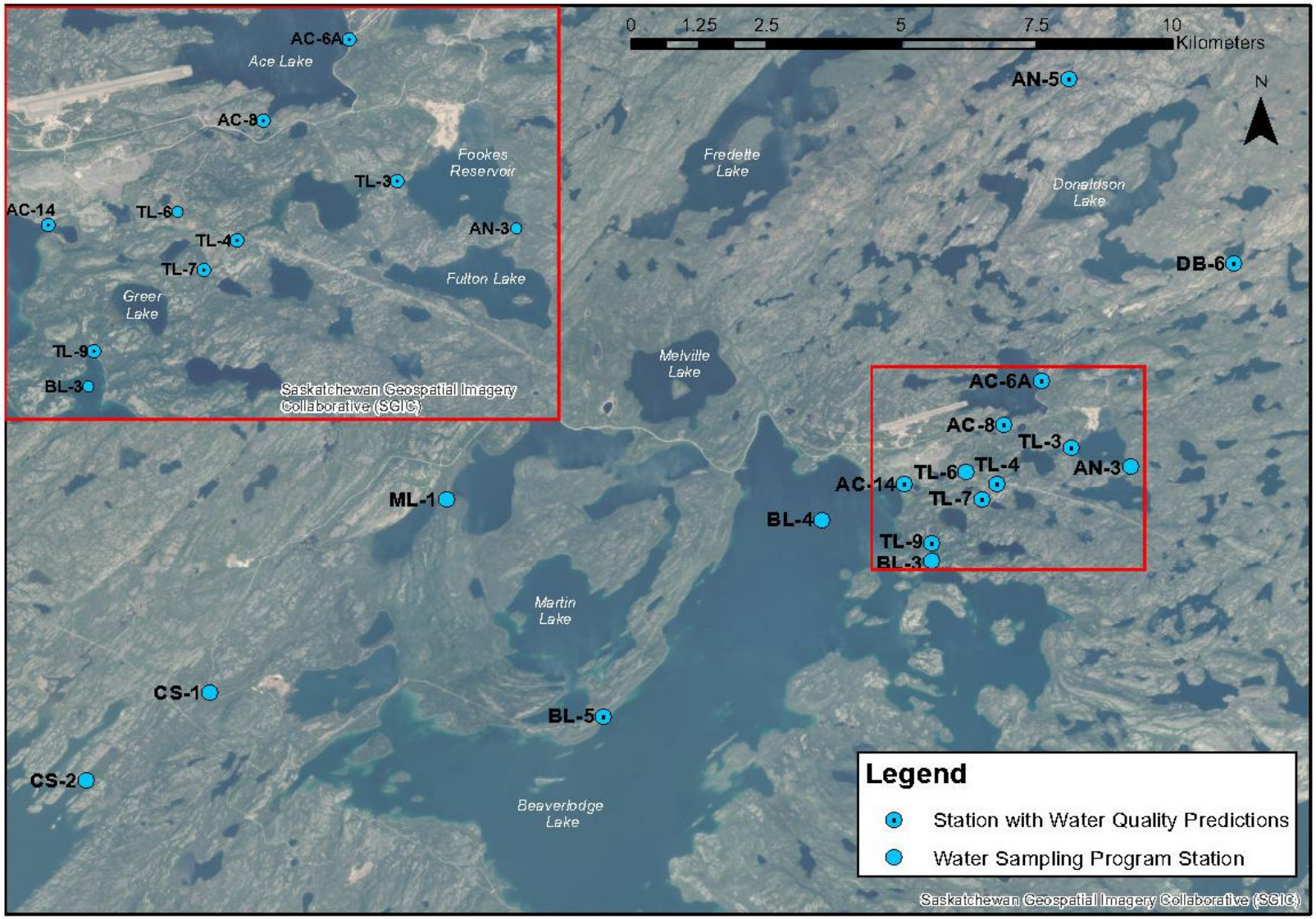
Ten stations, shown on figure 2.2, have been established at the Beaverlodge site which have long term water quality predictions for uranium, radium-226 and selenium. The figure also illustrates all current sample stations; the red insert displays the water quality stations in greater detail at the main Beaverlodge area.

Water quality results are discussed for those properties for which the established water quality performance criteria are applicable. Other properties have no performance indicators associated with them as the properties do not affect water quality. This is either because the properties are not adjacent to a waterbody or, if the properties are adjacent, adequate remediation was completed to limit releases to surface water.

Environmental performance of the Beaverlodge site is also communicated to the Commission in CNSC's uranium mines and mills regulatory oversight reports.

In the Record of Decision for the 2019 request for the release of properties from the Beaverlodge site [5], the Commission advised Cameco to have information available regarding grout longevity for future proceedings in which releases are requested. In response to the request, Cameco conducted research into grout longevity. The results of Cameco's research was provided to CNSC staff in submissions dated June 24, 2020, and July 14, 2020 [16], which also included a memo from the Saskatchewan Mining Association. The information indicated that while laboratory testing would be of limited value due to the time period required for testing, the formulation of the grout has been used successfully in the Saskatchewan potash mines for over 60 years under potentially harsher conditions (saline conditions and higher pressures). It was concluded that the grout used for the Beaverlodge site is expected to be effective in the long term. CNSC staff accepted the results of the research on grout longevity on July 15, 2020 [16].

Figure 2.2: Monitoring stations with long term water quality modeling predictions



Source: Cameco

3. MATTERS FOR CONSIDERATION

The 18 properties proposed for release from licensing by the CNSC are summarized within this section along with the applicable performance objectives and regulatory acceptance criteria. Table 3.1 summarizes these objectives and regulatory acceptance criteria for each property.

As noted in section 1.1, there are 45 properties at the Beaverlodge site that remain under a CNSC-issued licence. These properties, grouped into 5 areas at the site, are:

- HAB
- Dubyna
- Verna/Bolger
- Lower Ace Creek
- Tailings Management Area.

Milling and the main underground mines developed at the site are located in the Lower Ace Creek and Verna/Bolger areas. The tailings management area includes all properties that are part of the tailings management and water treatment areas. Although mining activities also occurred at HAB and Dubyna, these areas were not the primary source of ore for the mill. The following sections of this CMD have been broken down by area and then property.

Table 3.1: Properties to be exempted and/or released and the performance objectives and indicators

Area	Property	Performance Objective						Transfer to ICP
		Safe and Secure					Stable / Improving	
		Performance Indicator						
		Acceptable Gamma Levels	Boreholes Plugged	Stable Mine Openings	Stable Crown Pillar	Site Free From Debris	Water Quality Within Modelled Predictions	
HAB[1]	HAB 1	√	√	√	√	√	√	√ (~half)
	EXC 1	√	√	√	√	√	√	√
	HAB 2	√	√	√	√	√	√	√
Dubyna[2]	EMAR 1	√	√	n/a	√	√	√	√
Verna/ Bolger[3]	ACE 7	√	n/a	√	√	√	n/a	√
	ACE 8	√	√	√	√	√	n/a	√
	NW 3 Ext	√	n/a	√	√	√	n/a[4]	√
	NW 3	√	√	√	√	√	n/a[4]	√
Lower Ace Creek[3]	ACE 3	√	√	√	√	√	n/a	√
	ACE 14	√	n/a	n/a	√	√	n/a	√
	ACE MC	√	√	n/a	√	√	n/a	√
	ACE 9	√	√	n/a	√	√	n/a	√
	ACE 1	√	√	√	√	√	n/a	√ (majority)
	URA 4	√	√	√	√	√	n/a	√ (majority)
	EXC URA 7	√	n/a	n/a	√	√	√	√
	URA FR	√	√	n/a	√	√	√	√
Tailings Management Area[3]	GC 2	√	n/a	n/a	n/a	√	n/a[4]	√
	EXC ACE 15	√	n/a	n/a	n/a	√	n/a[4]	√ (~half)

1. HAB area properties with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.1.
2. Dubyna area properties with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.4.
3. Verna/Bolger, Lower Ace Creek and Tailings Management Area property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.6.
4. 2014 CNSC staff CMD 14-M60 [3] indicated that water quality performance indicator applicable to property NX3, NW 3 Ext, GC 2, EXC ACE 15. However, based on the information provided in Cameco's Closure Report submission [8], it is staff's determination that this should not apply to these properties. Refer to individual property discussions for further information.

n/a not applicable

The following sections provide a brief summary of the remaining mining and/or milling related structures and infrastructure, and information in order to demonstrate that the applicable performance indicators have been met. In order to reduce duplication, the "site free from debris" indicator is not discussed. Cameco has provided evidence of the completion of site inspections' clean-up activities to remove and dispose of debris at each of the properties which is included in their submission [8]. In addition, staff from both the Saskatchewan Ministry of Environment (SMOE) and CNSC have inspected the properties to confirm the adequacy of the clean-up efforts and to confirm the regulatory acceptance criteria of "site free from debris" has been met.

The results of a site-wide gamma radiation scan completed at the Beaverlodge site were submitted to the CNSC in 2014 [12]. Cameco also completed a gamma radiation risk evaluation report which was submitted to CNSC in 2015 [13]. Disturbed areas were scanned using a 10 metre grid (approximately), as terrain and vegetation allowed (considering safety and physical accessibility). The risk evaluation was conducted for those properties that had gamma radiation levels above criteria identified in the Saskatchewan *Northern Mine Decommissioning and Reclamation Guidelines* for gamma radiation [17]. These guidelines state that final radiation levels should not be greater than a mean of 1 µSv/hr above the natural range of variability that is observed at reference location (i.e. background radiation levels). The mean value is to be taken from a 100 metre by 100 metre area (1 hectare) and compared to background/reference values.

Four reference areas (Dubya, HAB, Lower Ace Creek and Verna/Bolger) were established and scanned as part of the 2014 gamma survey [12]. The gamma radiation levels from these reference areas were used to establish an average background of 0.14 µSv/hr for the Beaverlodge Project. Both reports were accepted by CNSC staff in 2015 after responses to CNSC comments were addressed.

The majority of the properties proposed for release meet the above noted criteria and have an average gamma radiation range of <0.1 µSv/hr to 1.0 µSv/hr above background and, therefore, meet the regulatory acceptance criteria and do not require further risk evaluation.

In order to reduce duplication in this report, the gamma radiation results are only discussed for those properties where the gamma radiation levels were above the decommissioning guidelines and required a risk evaluation (based on property usage) to demonstrate that regulatory acceptance criteria had been met. In addition, the gamma radiation scans were only conducted on disturbed areas of the site; therefore, there were no gamma scans conducted on 3 properties under consideration (EXC URA 7, URA FR and EXC ACE 15). These properties are considered to have met the acceptance criteria as there has been no surface disturbance which would have caused gamma radiation levels to be above background levels.

3.1 HAB Mining Area

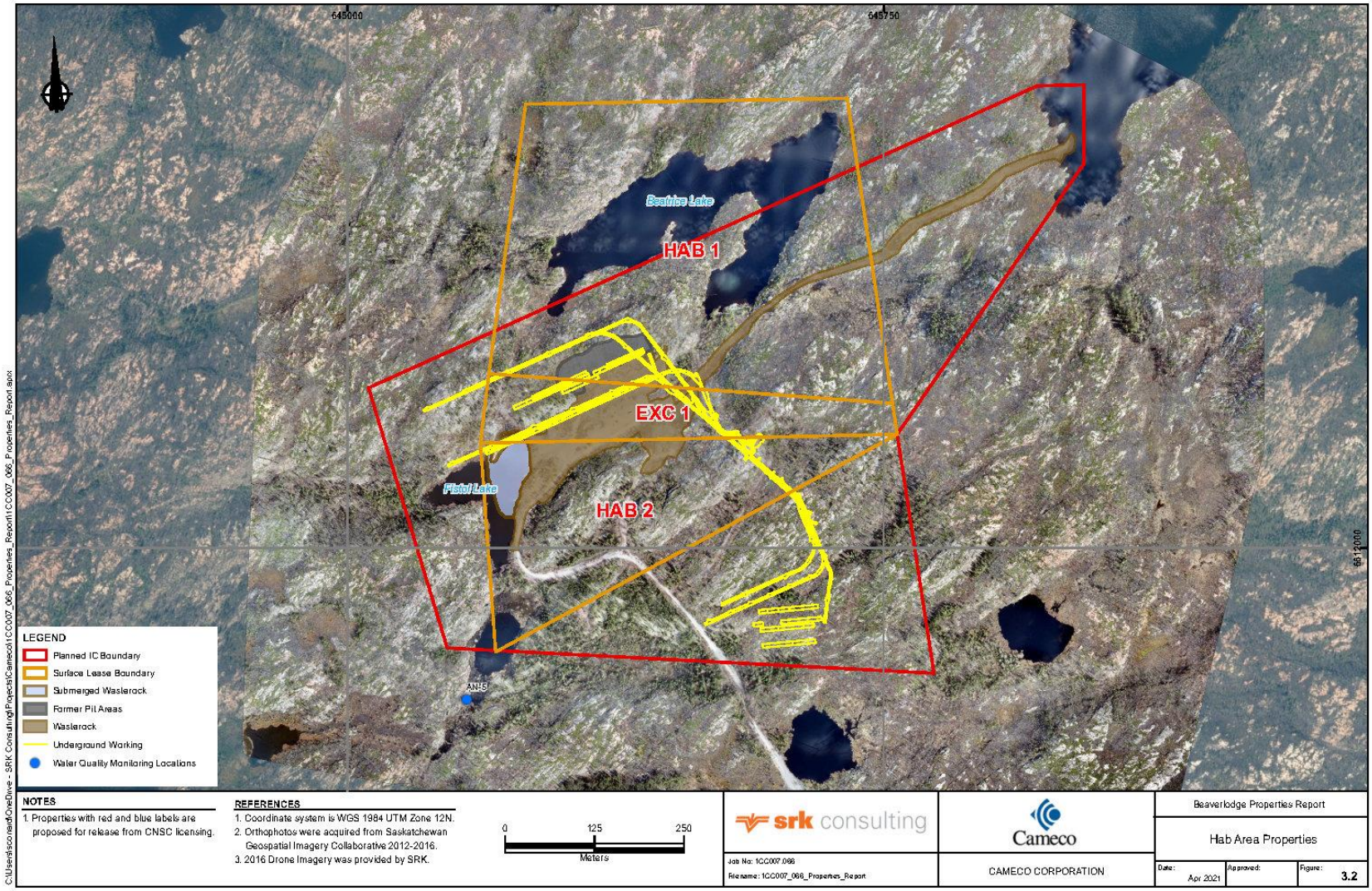
The HAB area consisted of 7 properties, 4 of which were released from licensing in 2019. Cameco has now requested release of the 3 remaining properties (HAB 1, EXC 1, HAB 2) from CNSC licensing by removing the property from appendix A of the Waste Facility Operating Licence, WFOL-W5-2120.1/2023. These 3 properties are shown on figure 3.1. Table 3.1 provides a summary of each property under consideration along with a comparison to the accepted performance indicators. Although not located on any of the above noted properties, the outlet of Pistol Lake is a station with water quality predictions (station AN-5). The water quality performance indicator applies to all 3 properties; however, in order to avoid duplication, the water quality performance indicators are only discussed for the HAB 1 property. Inspections of all the properties have been conducted and debris, if found, has been removed.

All boreholes located on the 3 properties have been plugged using concrete grout. There was no evidence of water previously flowing out of these boreholes (artesian conditions).

In follow-up to the October 2019 Commission hearing for the release of 20 properties, Cameco completed an assessment of the potential human health risks of a visitor to the HAB area. This assessment was completed as a result of concerns raised by the Athabasca Chipewyan First Nation with respect to the possibility of greater amounts of time spent in the HAB area by land users than initially stated in Cameco's land use study.

Available water quality, fish chemistry and gamma radiation levels were used to evaluate the potential risk to someone who may visit the HAB area. The assessment was provided to CNSC staff in June 2021 [18]. CNSC staff have reviewed the report and determined that Cameco's conclusion indicating there would likely be no risk to a visitor using the HAB area is appropriate. The assessment also concluded that living a traditional lifestyle and consuming country foods from the HAB area, as assessed, can continue to be done safely.

Figure 3.1: HAB Properties – areas to be released



Source: Cameco

3.1.1 HAB 1

The HAB 1 property consists of a 19.9 hectare parcel of land on the north edge of the former HAB mining area. The property consists of a backfilled open pit, 4 raises, which provided access to the underground mine, and a portion of the 225,000 tonnes of waste rock generated during mining of the HAB area, all located on the southern portion of the property. A raise is a vertical or near vertical excavation to an underground mine used for ventilation and/or emergency escape. Three of the raises were backfilled during the mining of the open pit and were covered when the pit was backfilled. The fourth raise has been covered with an engineered stainless steel cap.

The HAB underground mine extends under a portion of the property. The crown pillar thickness in 1 area is approximately 13 metres [14]. A crown pillar is the rock mass between the uppermost mine working and the ground surface. Due to the remoteness of the area and the fact that the area has been covered with waste rock as part of backfilling the open pit, the overall consequence of pillar failure was considered low. CNSC staff reviewed and accepted the geotechnical assessment conclusions. Long term monitoring of the area will be required when the site is transferred to the ICP to look for any evidence of sloughing.

The north side of the backfilled open pit has residual pit walls which range from 3 to 5 metres above the ground surface. The pit wall stability was assessed in 2010 [19]. The assessment concluded that slope instability is very unlikely and the remaining pit wall is similar to other natural features in the area. CNSC staff reviewed and accepted the conclusions of the stability assessment.

Waste rock at the site was used to construct a former access trail to Milmine Lake and to backfill the open pit. There is also a waste rock pile located along the south border of the property, approximately 0.5 hectares in size. Waste rock testing indicated that the uranium concentration in the rock is at or below 0.042% [20, 21] which is in the low range of what is currently considered special/mineralized waste rock (>0.03% uranium) at operating uranium mines in northern Saskatchewan. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and the HAB waste rock pile is expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

The HAB 1 property also contains Beatrice Lake. The outlet of Beatrice Lake is located at the east arm of the lake. Flow travels down the channel until it reaches the HAB waste rock pile at which point it can no longer be traced. It is assumed that the surface flow likely enters the mine workings through fissures in the rock and resurfaces in Pistol Lake (figure 3.2). Cameco has noted that periodically, during high water periods, a beaver dam located along the east arm of Beatrice Lake can cause water to flow out the west arm of the lake, running overland directly into Pistol Lake. In either instance, the flow of water though the property has the potential to impact water quality within Pistol Lake. The outlet of Pistol Lake (station AN-5) has long term water quality predictions for radium-226, selenium and uranium.

Figures 3.2 and 3.3 provides the water quality monitoring results along with the long-term radium-226 and uranium predictions, respectively, for the outlet of Pistol Lake. As selenium concentrations are currently below the *Saskatchewan Environmental Quality Guidelines* (SEQG) for freshwater aquatic life [23], and predicted to remain so in the long term, a graph of the selenium predictions has not been included in this CMD. These figures display the upper (95th percentile in dark green) and lower (5th percentile in light green) water quality prediction, water quality monitoring results (blue diamonds). The black vertical line represents the date at which decommissioning activities were complete and the red horizontal line reflects the applicable SEQG.

Figure 3.2: Long-term radium-226 predictions and water quality data for the outlet of Pistol Lake

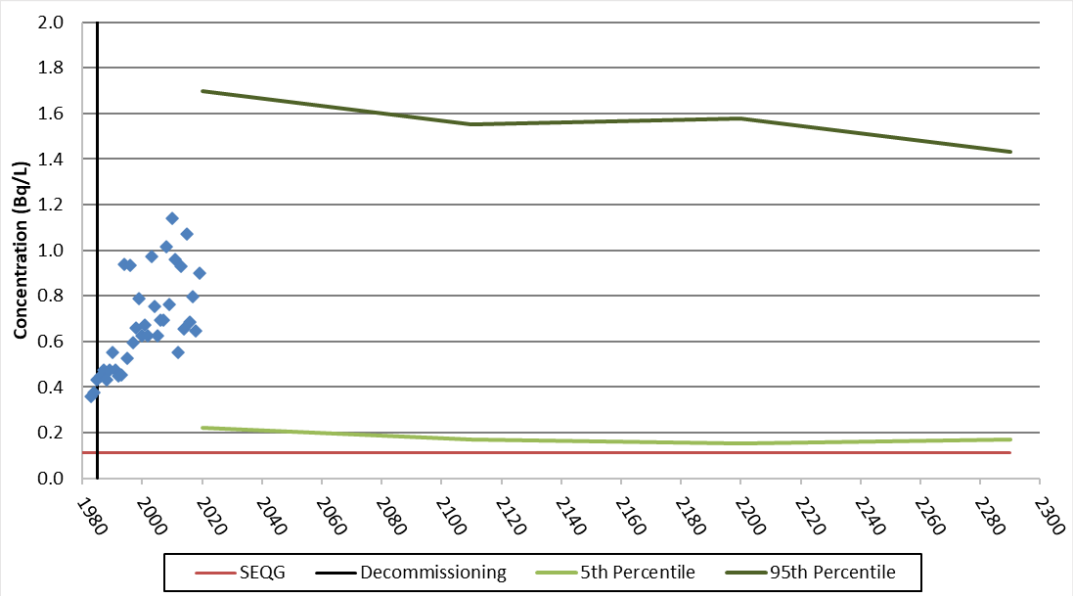
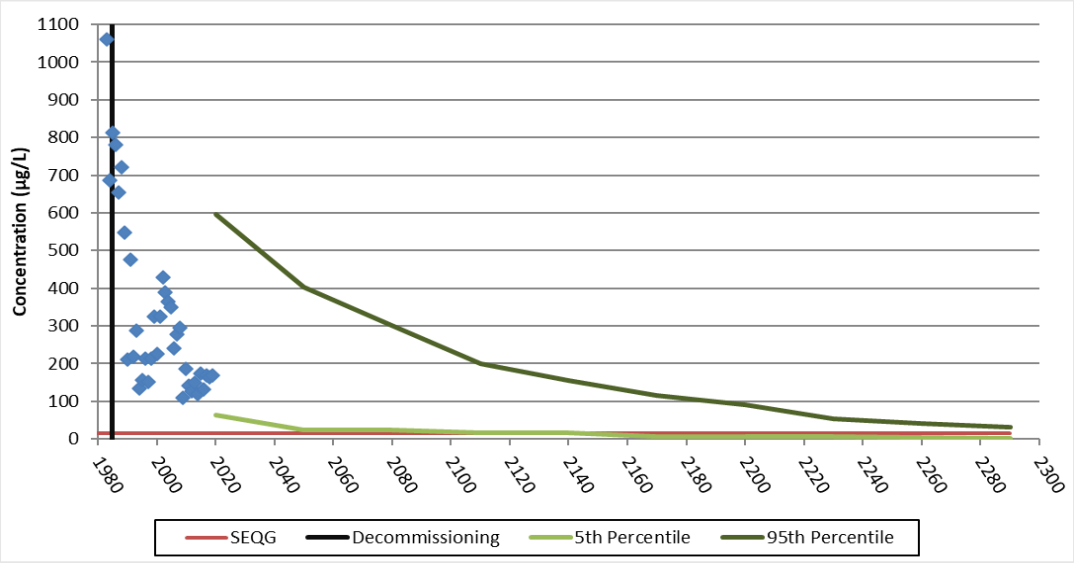


Figure 3.3: Long-term uranium predictions and water quality data for the outlet of Pistol Lake



The radium-226 levels at the outlet of Pistol Lake are expected to show a slight reduction over time but are expected to remain above the SEQG over the long term. Uranium concentrations are expected to continually decline over the long term, approaching SEQG. Water quality measured at the outlet of Pistol Lake is within the modelled predictions and therefore the water quality performance indicator and acceptance criteria has been met for the property.

Approximately half of the property is proposed for entry into the ICP, which includes all of the areas disturbed by mining (shown on figure 3.1). The remainder of the property is proposed for free release. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock
- evidence of crown pillar subsidence
- condition of beaver dam at the outlet of Beatrice Lake and evidence of flow from southwest arm of Beatrice Lake
- condition of the 3 backfilled raises
- condition of the stainless steel raise cap
- water quality monitoring at the outlet of Pistol Lake.

Water quality monitoring at the outlet of Pistol Lake will be conducted in coordination with the physical inspection of the area when the property is in the ICP.

Although the lifespan of the stainless steel raise cap is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.1.2 EXC 1

The EXC 1 property, shown on figure 3.1, is 3.9 hectares in size and is within the main HAB mining area. The property consists of: 3 raises which have been covered with stainless steel caps; 2 adits, whose entrances have been backfilled with rock; and a small portion of a backfilled open pit. There was also a raise located within the haulage adit that was secured by installing a concrete cap over the opening and then sealing the adit entrance. An adit is an entrance to an underground mine which is horizontal or nearly horizontal. A large portion of the 225,000 tonnes of waste rock generated during mining of the HAB area formed a pile covering approximately 3.5 hectares, most of the western portion of the property.

The 039 Zone of the HAB underground mine extends under a portion of the property. The crown pillar thickness is as low as approximately 13 metres in 1 area [14]. Due to the remoteness and the fact that the area has been covered with waste rock as part of backfilling the open pit, the overall consequence of pillar failure was considered low. CNSC staff reviewed and accepted the geotechnical assessment conclusions. Long term monitoring of the area will be required when the site is transferred to the ICP.

Waste rock testing indicates that the uranium concentration in the rock is at or below 0.042% [20, 21] which is in the low range of what is currently considered special/mineralized waste rock (>0.03% uranium) at operating uranium mines in northern Saskatchewan. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 by an independent consultant and validated that the HAB waste rock pile is expected to remain stable [22]. The assessment report was reviewed and accepted by CNSC staff.

The water quality performance indicator is applicable and water quality predictions have been made for the outlet of Pistol Lake. As discussed in section 3.1.1, the water quality performance indicator has been met.

The entire property is proposed for entry into the ICP, as shown on figure 3.1. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock
- evidence of crown pillar subsidence
- condition of the stainless steel caps on 3 raises
- conditions of the 2 adit waste rock plugs
- water quality monitoring at the outlet of Pistol Lake.

Although the lifespan of the stainless steel raise caps are estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.1.3 HAB 2

The HAB 2 property is 8.3 hectares in size and includes the western most portion of the HAB waste rock pile, including submerged rock within Pistol Lake. Pistol Lake has a surface area of approximately 1.2 hectares, an average depth of 0.95 metres and a maximum depth of 2.0 metres. A fisheries investigation conducted in 2011 found no evidence of fish within the lake [8]. A water quality performance indicator station is located at the outlet of Pistol Lake (figure 3.1).

A section of the 038 Zone of the HAB underground mine extends under the property. The crown pillar thickness is approximately 50 metres below the ground level. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

The property contains a portion of the HAB waste rock pile. The HAB shaft is located on the eastern portion of the property which has been capped with a stainless steel cap. Waste rock testing indicated that the uranium concentration in the rock is at or below 0.042% [20, 21], which is in the low range of what is currently considered special/mineralized waste rock (>0.03% uranium) at operating uranium mines in northern Saskatchewan. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and the HAB waste rock pile is expected to remain stable [22].

The water quality performance indicator is applicable and water quality predictions have been made for the outlet of Pistol Lake. As discussed in section 3.1.1, the water quality performance indicator has been met.

The entire property is proposed for entry into the ICP, as shown on figure 3.1. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock
- condition of the stainless steel cap on the shaft
- water quality monitoring at the outlet of Pistol Lake.

Although the lifespan of the stainless steel raise cap is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

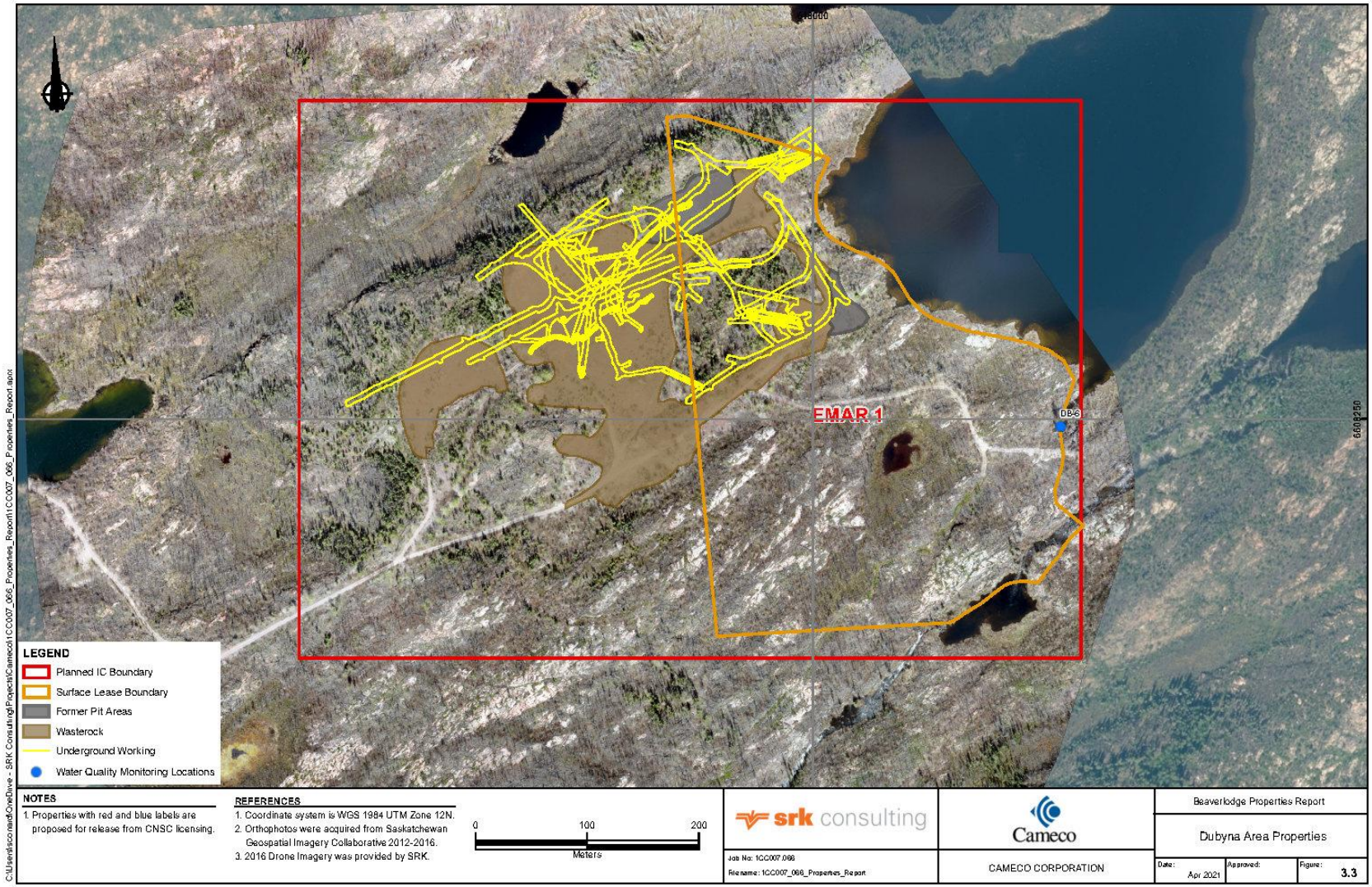
3.2 Dubyna Mining Area

The Dubyna mining area consisted of 2 properties, 1 of which was released from licensing in 2019 (JO-NES), as shown on the left side area of figure 3.4. Cameco has now requested release of the second from CNSC licensing (EMAR 1) by removing the property from appendix A of the Waste Facility Operating Licence, WFOL-W5-2120.1/2023. Table 3.1 provides a summary of the property along with a comparison to the accepted performance indicators.

The EMAR 1 property is 10.1 hectares in size and includes the western portion of Dubyna Lake and eastern portion of the Dubyna mining area. The site consists of a backfilled open pit and a portion of the Dubyna waste rock pile. There is a water quality performance indicator station located at the outlet of Dubyna Lake and the performance indicator and regulatory acceptance criteria apply to this property.

Following documentation reviews and onsite field investigations, all boreholes found on the property were plugged with concrete grout. Two of the boreholes located exhibited either artesian conditions, or the potential for artesian conditions to occur. The sealing of the boreholes was identified as a remedial activity conducted to improve the water quality within Dubyna Lake as water from the holes flowed towards the lake. Water quality monitoring at the outlet of Dubyna Lake provides verification of the adequacy of the borehole sealing activities. CNSC staff reviewed and accepted the proposed remediation measures.

Figure 3.4: Dubyna Properties – areas to be released



Source: Cameco

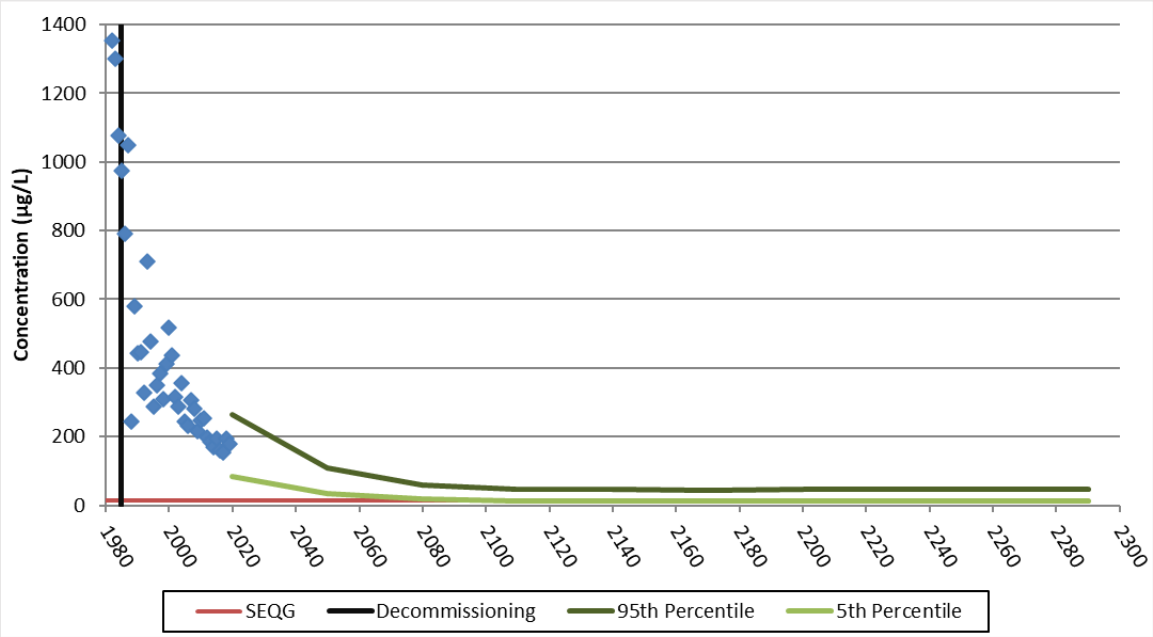
The Dubyna mine is located under the northwestern portion of the property. The thinnest areas of the crown pillar ranges from 6 metres under the backfilled open pit to areas with a 20 metre depth below the surface. The consequence of a crown pillar collapse is low due to the remoteness and the fact that the areas have been covered with waste rock [14]; however, monitoring is still required. Long term monitoring will be conducted when the site is transferred to the ICP. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

The backfilled open pit has walls that extend to approximately 14 metres in height along the north and west sides. The stability of the pit walls was assessed in 2010. It was concluded that slope instability is not expected and the risk of rock fall is limited [19]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

Approximately 359,000 tonnes of waste rock was generated during mining. This waste rock was deposited on both the JO-NES and EMAR 1 properties covering an area of approximately 2.3 hectares, with the majority of the pile located on the JO-NES property. Waste rock testing indicated that the uranium concentration in the rock is below 0.07% [21, 24], which is in the low range for what is currently considered special/mineralized waste rock (>0.03% uranium) and has a low potential for acid generation. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and the Dubyna waste rock pile is expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

The outlet of Dubyna Lake (station DB-6) has long term water quality predictions for radium-226, selenium and uranium. Figure 3.5 provides the long-term uranium predictions and water quality monitoring results. As both radium-226 and selenium concentrations are currently below SEQG and predicted to remain so in the long term, these graphs have not been included in this CMD, but are available in Cameco's Final Closure Report [8]. Figure 3.5 shows the upper (95th percentile) and lower (5th percentile) water quality predictions, water quality monitoring results, and the applicable SEQG for freshwater aquatic life.

Figure 3.5: Long-term uranium predictions and water quality data for the outlet of Dubyna Lake



Uranium concentrations are within water quality predictions and are expected to continue to decline over time. The water quality performance indicator and acceptance criteria has been met for the property.

The entire property is proposed for entry into the ICP, as shown on figure 3.4. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of pit wall
- condition of the waste rock
- evidence of crown pillar subsidence, particularly the areas identified for inspection
- water quality monitoring at the outlet of Dubyna Lake.

No structures requiring maintenance are present on the property.

3.3 Verna/Bolger Mining Area

The Verna/Bolger area properties, shown in the top right area on figure 3.6, consisted of 7 properties, 2 of which were released from licensing in 2019. Cameco has requested release of 4 of the 5 remaining properties from CNSC licensing (ACE 7, ACE 8, NW 3 Ext, and NW 3), as shown in appendix A of the Waste Facility Operating Licence, WFOL-W5-2120.1/2023. Table 3.1 provides a summary of each property under consideration of release along with a comparison to the accepted performance indicators.

Inspections of all the properties have been conducted and debris, if found, has been removed. Of the 4 properties under consideration, only ACE 8 and NW 3 have records of boreholes being present on the property. All boreholes on these properties were plugged using concrete grout and none showed any evidence of artesian conditions.

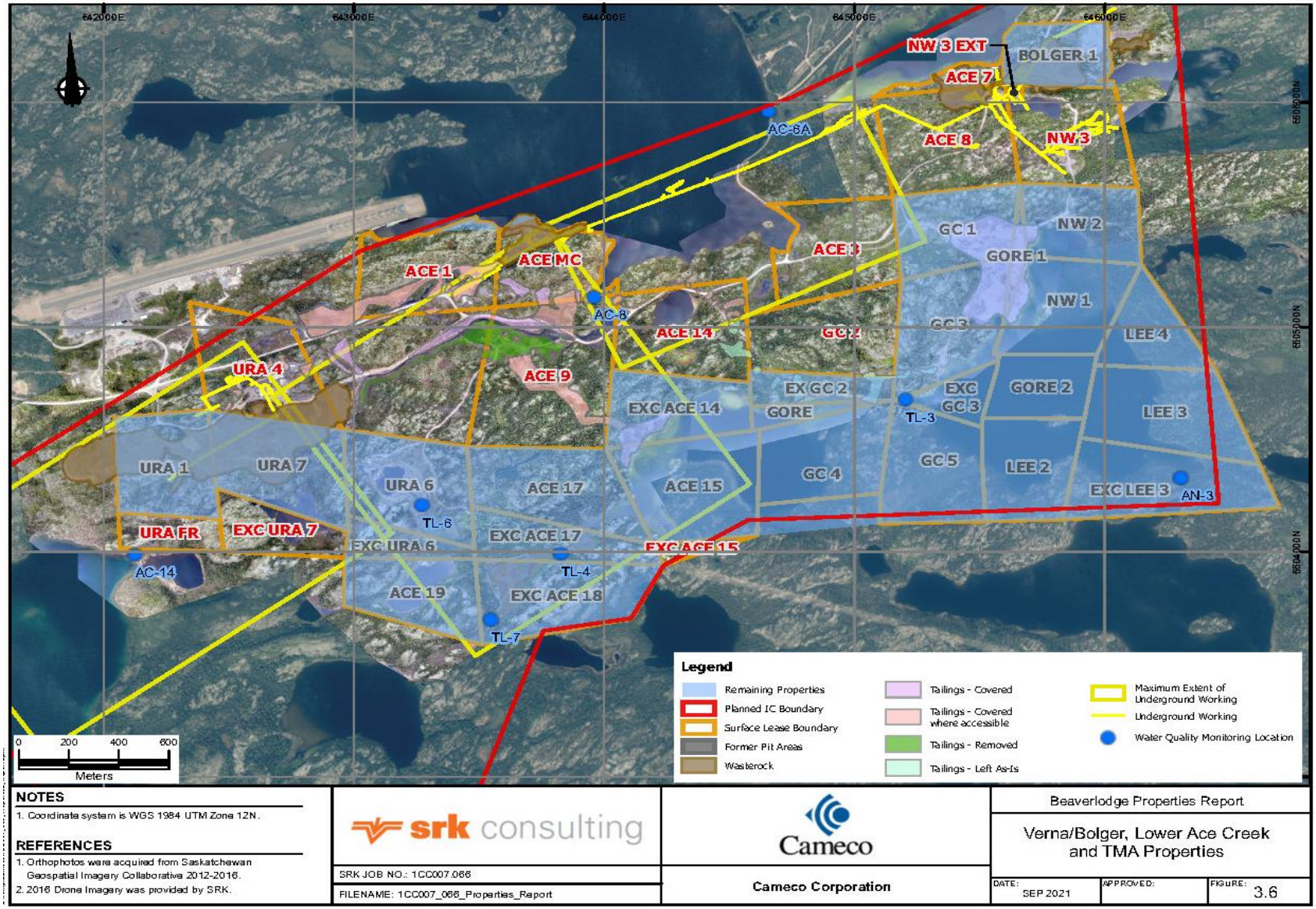
The Bolger 1 property is not included in the current request. Cameco undertook a remediation project which involved the relocation of a waste rock pile and re-establishment of the historic path of Zora Creek in an effort to improve water quality (uranium concentrations) within Verna Lake. The project was completed in 2016 and water quality and geotechnical monitoring continues to be conducted to evaluate the effectiveness of the remediation project and confirm stability of the slopes, respectively. It is expected that once Cameco can demonstrate that water quality performance objectives have been met, they will request a release of this property from CNSC licensing.

3.3.1 ACE 7

Located on the south shore of Verna Lake, the ACE 7 property is 3.5 hectares in size and includes a waste rock pile. During its operation, approximately 249,100 tonnes of waste rock was produced by the Verna mine. This waste rock, deposited into a pile, is on both the ACE 7 and ACE 8 properties and covers an area of approximately 2.7 hectares. A portion of this pile extends into Verna Lake. There is a report of an adit on the property which was closed during operations. However, based on investigations completed by Cameco, it appears the waste rock pile covered this adit and there are no concerns regarding sloughing or instability as a result of this covered adit.

A portion of the Verna underground mine workings extend under the eastern edge of the property. The approximate depth of the workings is more than 150 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Figure 3.6: Verna/Bolger, Lower Ace Creek and TMA Properties – areas to be released



Source: Cameco

Waste rock testing indicated that the uranium concentration in the rock ranges from less than 0.01% to 0.032% [21, 24], which is at or below the low range of what is currently considered special/mineralized waste rock (>0.03% uranium) at operating uranium mines in northern Saskatchewan. The waste rock also has a low sulphide content and low acid generating potential. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and the Verna waste rock pile is expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

There are no water quality performance indicators for this property. Although a portion of the Verna waste rock pile extends into Verna Lake, the pile was not considered to be a significant source of contaminants when the quantitative site model with the corresponding water quality predictions was prepared. CNSC staff reviewed the quantitative site model and accepted that the water quality performance indicator did not apply to this property.

There are water quality predictions for the outlet of Verna Lake (station AC-6A). Water quality monitoring of Verna Lake will continue to be conducted by Cameco until the last remaining property in the area (Bolger 1) is transferred to the ICP, at which time a long term monitoring program will be proposed.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock.

No structures requiring maintenance are present on the property.

3.3.2 ACE 8

The ACE 8 property is 23.2 hectares in size and located south of Verna Lake and ACE 7. The property hosts a portion of the waste rock removed from the Verna shaft which is located on the ACE 8 property. The concrete shaft cap installed during decommissioning was replaced with a stainless steel cap in 2018.

The Verna underground mine workings extend under the property at an approximate depth of 80 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Waste rock testing and pile stability are discussed in section 3.3.1. The waste rock has a low uranium content and a low potential for acid generation. Also, visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The waste rock pile is expected to remain stable. CNSC staff reviewed and accepted the conclusions of the stability assessment.

A portion of Up Lake is located on the ACE 8 property. Although there are no water quality performance indicators associated with this property or lake, Cameco was requested by CNSC staff to conduct water sampling to determine the potential risk to humans from consuming water from the waterbody. Results of this investigation are provided in section 3.3.4 as the majority of this lake is located on the NW 3 property. It was concluded that the short-term consumption of water from Up Lake is unlikely to pose a risk to humans.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock
- condition of the stainless steel cap on the shaft.

Although the lifespan of the stainless steel raise cap is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.3.3 NW 3 Ext

The NW 3 Extension (Ext) property is 0.5 hectares in size and located on the north shore of Up Lake. There are 3 underground mine openings on the property: the Verna mine ventilation raise; finger raise; and Verna ladder access raise. The 3 openings have been secured with stainless steel caps. There are no waste rock piles on the property, although waste rock was used to construct facilities and roads on the property. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition.

The Verna mine is beneath the surface at an approximate depth of 80 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

In CNSC staff's 2014 CMD [3], staff indicated that water quality indicators applied to the property. However, this determination was made prior to the Bolger flow path remediation project. After completion of the project, it was determined that both the NW 3 and NW 3 Ext properties do not influence the source load contributions to Verna Lake; therefore, the water quality indicator in Verna Lake is not applicable. Cameco's Final Closure Report [8] also provided additional information on the property which was not available to staff in 2014 when the performance indicators were established. Based on the documentation provided to CNSC and field verification by CNSC staff, CNSC staff concluded that the water quality performance indicator is not applicable to the either the NW 3 or NW 3 Ext property. However, CNSC staff requested that Cameco study the Up Lake water quality and assess the potential for the presence of fish to determine if there was any risk to humans as a result of the waterbody. The results of the Up Lake investigation are summarized in section 3.3.4 as the majority of the waterbody is within the NW 3 property.

The entire NW 3 Ext property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the stainless steel caps on the raises and on the manway.

Although the lifespan of the stainless steel raise caps is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.3.4 NW 3

The NW 3 property is 19.6 hectares in size and located south of the former Bolger pit area. The 72 Zone portal and the majority of Up Lake are located on the property and a portion of Zora Lake is located on the undeveloped eastern edge of the property. The adit was secured by backfilling the entrance with waste rock in 1982; visual monitoring conducted since that time has not shown any indication of slumping or erosion of the backfill.

Sections of the Verna underground mine and the 72 Zone extend under the property at a depth of 40 metres or greater. The geotechnical assessment of the crown pillar of both the 72 Zone and Verna mine indicated that there was a low likelihood of crown pillar subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

A small portion of the Bolger waste rock pile is located on the northern portion of the property. Waste rock was also used to construct roads on the property.

Waste rock testing of the Bolger waste rock pile indicate that the uranium concentration in the rock ranged from less than 0.01% to 0.062% [21, 24], which is at or below the low range of what is currently considered special/mineralized waste rock (>0.03% uranium) at operating uranium mines in northern Saskatchewan. The waste rock also has a low sulphide content and low acid generating potential. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. In 2010, the stability of the waste rock piles at the Beaverlodge site was assessed as well as the Bolger waste rock pile; it was determined that these are expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

A remediation project was conducted from 2014 to 2016 which involved re-establishing the flow path for Zora Creek and, as a result, a significant volume of waste rock was relocated, mainly on the Bolger 1 property. Geotechnical inspections continue to be conducted; the most recent being in 2020. During this 2020 inspection, it was noted that the site is stable and no concerns were noted. However, the Bolger 1 property is not currently proposed for transfer to the ICP.

As noted in section 3.3.3, based on the documentation provided to and field verification by CNSC staff, it was concluded by CNSC staff that the water quality performance indicator is not applicable to this property. However, an assessment of water quality and the potential for the presence of fish was completed by Cameco at the request of CNSC staff to determine if there was any risk to humans as a result of the waterbody.

Up Lake has no regular outflow; however, discharge has been observed from Up Lake to Zora Creek during periods of heavy precipitation or snowmelt. There are no water quality performance indicators associated with this waterbody. Cameco conducted a water quality investigation and assessed the potential for fish to reside in the waterbody. This was conducted in order to determine the potential risk to humans for the occasional consumption of water or fish from the waterbody.

Cameco submitted technical memorandums on December 2, 2020, indicating it was unlikely that Up Lake could support a viable fishery due to the isolated nature of the lake, small catchment area, and restriction of access of fish from Zora Lake [25]. Water quality sampling was conducted in 2020 and these results were used to determine the risk of human consumption of water from the lake. The risk evaluation concluded that the short-term consumption of drinking water is unlikely to pose a risk to people, considering both the chemical toxicity of uranium and radioactivity [25]. CNSC staff concluded that the assessment was carried out in an adequately conservative manner and accepted the conclusion that there is negligible risk to humans from the short-term consumption of water from Up Lake.

A portion of Zora Lake is located on the undeveloped eastern edge of the property. There are no water quality performance indicators associated with Zora Lake.

The entire NW 3 property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of waste rock
- condition of the portal waste rock plug.

Based on the stability of the existing waste rock plug at the entrance observed to date, no maintenance is proposed for this structure. No other structures requiring maintenance are present on the property.

3.4 Lower Ace Creek Area

The Lower Ace Creek area consisted of 20 properties, 10 of which were released from licensing in 2019. Cameco has now requested the release of 8 more properties from CNSC licensing (ACE 3, ACE 14, ACE MC, ACE 9, ACE 1, URA 4, EXC URA 7 and URA FR) by removing the properties from appendix A of the Waste Facility Operating Licence, WFOL-W5-2120.1/2023. Figure 3.6 shows the properties and table 3.1 provides a summary of each property under consideration along with a comparison to the accepted performance indicators.

Inspections of all the properties have been conducted and debris, if found, has been removed.

There is no evidence of boreholes being present on the ACE 14 and EXC URA 7 properties, thus the performance indicator is not considered applicable to these 2 properties. The 6 other properties had boreholes/drain holes present that were plugged using concrete grout. Properties URA FR and ACE 1 had boreholes or drain holes that either exhibited flow or showed the potential to have artesian conditions. Property URA FR had 2 boreholes and property ACE 1 had 2 drain holes. The drain holes were constructed as part of the decommissioning of the Ace mine. The 2 drain holes connected the drainage from the Ace Stope area to a former vent raise on the ACE 1 property. There was periodic flow of water from the holes to the surface. The drain holes were discussed during the 2020 regulatory inspection and Cameco was asked by CNSC staff to seal the holes. Sealing was completed in 2021.

Gamma radiation results for the ACE 14, ACE MC, ACE 9 and ACE 1 properties are discussed in the applicable property summaries. These 4 properties had areas with gamma radiation levels above criteria identified in the Saskatchewan *Northern Mine Decommissioning and Reclamation Guidelines* [17] and thus additional risk evaluations were completed as described in the applicable section.

3.4.1 ACE 3

The ACE 3 property is 20.9 hectares in size in the southeastern side of Ace Lake. The junction between the Dubyna/HAB site access road and the road to the Verna shaft is located on the property as well as the Bored Vent Raise to the Fay-Verna mine. A stainless steel cap was installed over the existing concrete cap in 2017. The majority of the property was not disturbed by mining operations and the only waste rock on the property was that used to construct the roads and raise. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The Fay mine may extend under the property at an approximate depth of more than 150 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the stainless steel cap on raise.

Although the lifespan of the stainless steel raise cap is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.4.2 ACE 14

The ACE 14 property is 21.0 hectares in size and located south of Ace Lake. Although no mining activities occurred on this property, the property included the main haul road between the Fay and Verna mine site and also a portion of the tailings pipeline corridor. As a result of the pipeline, there are historic tailings spills as shown on figure 3.6. Because of the inaccessibility of some tailings, those on which vegetation had naturally occurred, or tailings within heavily wooded areas, these areas were assessed on an individual basis during decommissioning to determine whether they should be left as is, covered or removed. If a decision was made to leave a particular area “as is”, it was because any attempts to remove or cover such areas would have resulted in greater damage to the environment than if the area was left undisturbed. Where accessible, tailings spills were either removed or covered with approximately 0.6 metres of waste rock.

Decisions on individual spill areas were made with the participation of provincial and federal regulatory agency personnel. The decommissioning plan indicated that gamma exposure rates were considered during the decision making [8].

The ACE 14 properties tailings spill sites were either covered where accessible or left as is.

There are no waste rock piles on the ACE 14 property. Any waste rock on the property is limited to the road and areas of covered tailings. Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. In 2014, Cameco retained an independent consultant to conduct a gamma survey on all disturbed areas on the property. The gamma levels on the property ranged from 0.3 µSv/hr to 3 µSv/hr above background [12]. Only small portions of the property along the former tailings corridor had elevated gamma radiation levels.

Based on interviews conducted by consultants retained by Cameco during the 2014 Uranium City consultation on land use, the primary interaction between the residents of Uranium City and the property was determined to be limited to using the main access road which transects a small portion of the property [26]. Site specific doses were calculated based on average dose rates and reported as part of the Site Gamma Radiation Risk Evaluation [13]. The maximum estimated incremental dose for this property was 0.04 mSv per year, well below the dose limit to members of the public of 1 mSv per year.

The Fay mine may extend under a portion of the property at an approximate depth of 400 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Watson Lake is also located on the ACE 14 property. Watson Lake is approximately 2 hectares in size with an average and maximum depth of 1.5 metres and 5.1 metres, respectively. The lake has no regular outflow, however there may be a connection to Ace Creek during periods of heavy precipitation or snowmelt. The lake was assessed during the development of the quantitative site model, and it was concluded that it was not a significant source of contaminants to Ace Creek. There are no water quality performance indicators associated with this waterbody.

As a result of recommendations from the Saskatchewan Ministry of Environment (SMOE) and CNSC staff, Cameco conducted a water quality and fisheries investigation of the waterbody. This was requested in order to determine the potential risk to humans for the occasional consumption of water or fish from this waterbody. Cameco's technical memorandums submitted on December 2, 2020 [25] verified that no large bodied fish were captured. Water quality data from 2017 was used to determine the risk of human consumption of water from Watson Lake. The risk evaluation concluded that the short-term consumption of drinking water is unlikely to pose a risk to people, considering both the chemical toxicity of uranium and radioactivity [25]. CNSC staff concluded that the assessment was carried out in an adequately conservative manner and accepted the conclusion there is negligible risk to humans from the short-term consumption of water from Watson Lake.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of tailings spill sites.

No structures requiring maintenance are present on the property.

3.4.3 ACE MC

The ACE MC property is 14.5 hectares in size and located on the south shore of Ace Lake. The mouth of Ace Creek, which flows between Ace Lake and Beaverlodge Lake, is located on the property. The Ace shaft, 2 raises and 1 waste rock pile are located on this property. The shaft and 1 raise have been secured with stainless steel caps. The second raise (201 Raise), excavated in 2016, was found to have no concrete collar and had been backfilled with no sign of sloughing. Similar to the remediation of the crown pillar on the ACE 1 property, the excavation was filled and then covered with waste rock as a preventive measure should sloughing of the raise occur in the future.

As with the ACE 7 property, a portion of the tailings pipeline was present on the southern portion of the property which resulted in historic tailings spills as shown on figure 3.6. As noted in section 3.4.2, with the participation of provincial and federal regulatory agency personnel, decisions were made during decommissioning to have the tailings spill sites removed, covered, or covered where accessible. Gamma radiation exposure rates were considered during the decision making.

The majority of the tailings spill sites on the property were covered with approximately 0.6 metres of waste rock. There was also a small area on the southern eastern portion of the property where tailings were covered only when accessible.

The Fay/Ace/Verna underground mine workings extend under the property at a depth of more than 50 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Adjacent to Ace Lake and covering an estimated 2.0 hectares, approximately 228,600 tonnes of waste rock is present on the property. Waste rock testing indicates that the uranium concentration in the rock is from 0.014% to 0.018% [24], which is below the range for what is currently considered special/mineralized waste rock (>0.03% uranium). Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and is expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

In 2014, a gamma survey was conducted on all disturbed areas at the property by an independent consultant retained by Cameco. The gamma levels on the property ranged from less than 0.1 µSv/hr to 3 µSv/hr above background [12]. Cameco noted that only a small portion of the property along the former tailings corridor had gamma levels exceeding an average of 1 µSv/hr above background. This was on a steeply sloped and heavily vegetated area of the property. Site specific doses were calculated based on average dose rates and reported as part of the Site Gamma Radiation Risk Evaluation [13]. The maximum estimated incremental dose for this property was 0.04 mSv per year, well below the dose limit to members of the public of 1 mSv per year.

Although the waste rock pile on this property is directly adjacent to Ace Lake, the release of contaminants from the waste rock pile were assessed when the original 2012 quantitative site model was developed; the release was considered minor. The quantitative site model was reviewed and accepted by CNSC staff. Therefore, there are no water quality predictions associated with this property as outlined in the 2014 CMD [3]. However, there is a station with water quality predictions on the property at the outlet of Ace Lake. This station, AC-8, was established to monitor the impact of select properties near or upstream of Ace Lake. Currently the water quality at station AC-8 meets *Saskatchewan Environmental Quality Guidelines* (SEQG).

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of the waste rock
- condition of tailings spill sites
- condition of the Ace shaft and raise cap
- condition of the 201 Raise area for signs of sloughing.

Although the lifespan of the stainless steel raise cap is estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.4.4 ACE 9

The ACE 9 property is 34 hectares in size and located south of property ACE MC. Ace Creek, which flows between Ace Lake and Beaverlodge Lake, runs through the northern portion of the property. There was no mining development on the surface of the property, however a tailings pipeline was present which resulted in historic tailings spills (shown on figure 3.6). As noted in section 3.4.2, with the participation of provincial and federal regulatory agency personnel, decisions were made during decommissioning to have the tailings spill sites removed, covered, or covered where accessible. Gamma radiation exposure rates were considered during the decision making. Historic tailings spills south of Ace Creek were remediated by excavating the tailings. Spills north of Ace Creek were covered with approximately 0.6 metres of waste rock, and spill sites in the remainder of the property were covered with waste rock, where accessible.

The Fay/Ace/Verna underground mine workings extend under the property at a depth of more than 50 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

In 2014 a gamma survey was conducted on all disturbed areas at the property by an independent consultant retained by Cameco. The gamma levels on the property ranged from 0.1 µSv/hr to 3 µSv/hr above background [12]. Cameco noted that only a small portion of the property, along the former tailings corridor had gamma levels exceeding and average of 1 µSv/hr above background. This was on steeply sloped and heavily vegetated areas of the property. Site specific doses were calculated based on average dose rates and reported as part of the Site Gamma Radiation Risk Evaluation [13]. The maximum estimated incremental dose for this property was 0.04 mSv per year, well below the dose limit to members of the public of 1 mSv per year. At the request of CNSC staff, Cameco conducted an additional scan of a portion of the ACE 9 property (south of Ace Creek). The request was made by CNSC in order to verify that the tailings cover remains stable. The results from this September 2021 scan [27] were consistent with the 2014 gamma scan results.

Ace Creek passes through a portion of the property, however due to the remediation of accessible spilled tailings and, as supported by water quality monitoring of Ace Creek, the ACE 9 property is not expected to negatively impact the water quality within the creek. Water quality of Ace Creek will continue to be monitored at station AC-14 and the results compared to modelled predictions. Water quality predictions are applicable to properties URA FR and EXC URA 7 located along the lower reach of Ace Creek.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of tailings spill sites
- evidence of erosion along Ace Creek.

No structures requiring maintenance are present on the property.

3.4.5 ACE 1

The ACE 1 property is 19.5 hectares in size and located on the south shore of Ace Lake, near the Uranium City airport. The property contained 5 raises to the underground mine as well as the dorrclone facility, which was used to separate fine and coarse tailings. Coarse tailings were pumped to the underground mine and used as backfill whereas fine tailings were pumped to the tailing management area. There was a tailings pipeline which ran from the mill to the dorrclone and from the dorrclone to the tailings management area. There were no waste rock piles on the property, however waste rock was used for road construction and the base for the dorrclone facility. Waste rock was also used more recently as cover material as part of a crown pillar mitigation program.

Two raises were covered with stainless steel caps in 2017 and 1 raise (105#2) was covered with an engineered rock cover in 2018. The engineered rock cover was used because the entire area was covered with waste rock as part of the crown pillar mitigation program, making inspection of the cap impractical. Two of the 5 raises, the 195 Access Raise and the 195 Raise, were sealed in 1984 and buried with waste rock. This waste rock forms the base of the hill where the dorrclone facility was located. In 2019, Cameco conducted an investigation to locate the collars for these 2 raises. It was determined from this inspection that these raises appeared to be under water. The area around these 2 raises was backfilled and waste rock placed over the area after the investigation was complete.

Historic tailings spills occurred throughout the southern portion of the property where the tailings pipelines were located, as shown on figure 3.6. As noted in section 3.4.2, decisions to remove, cover, and cover where accessible, tailings spill sites were made during decommissioning with the participation of provincial and federal regulatory agency personnel. Gamma radiation exposure rates were considered during the decision making. The tailings spill sites on the property were covered with approximately 0.6 metres of waste rock, where accessible.

The Fay/Ace/Verna underground mine workings extend under the property. The crown pillar thickness is estimated to be 13.2 metres at its thinnest point, which includes 5.3 metres of overburden and a 7.9 metre surface pillar [14]. A surface subsidence of the crown pillar occurred in 2013. As a result of this subsidence, Cameco undertook a geotechnical assessment of the crown pillar stability at the site and developed a mitigation program which involved the construction of berms between 1.5 metres to 2 metres high over the historic mining stopes. These berms included broken concrete covered by sorted waste rock. The intent of the berms is to minimize surface subsidence as a result of any future crown pillar collapse. Geotechnical inspections of the 2 berms have been conducted and it has been determined that they are remaining stable. CNSC staff reviewed and accepted the mitigation measures and verified the implementation of these measures through document reviews and inspections.

In 2014, a gamma survey was conducted on all disturbed areas at the property by an independent consultant retained by Cameco. The gamma levels on the property ranged from 0.1 µSv/hr to greater than3 µSv/hr above background [12]. Cameco noted that only a portion of the property had gamma levels exceeding an average of 1 µSv/hr above background. Site specific doses were calculated based on average dose rates and reported as part of the Site Gamma Radiation Risk Evaluation [13]. The maximum estimated incremental dose for this property was 0.04 mSv per year, well below the dose limit to members of the public of 1 mSv per year.

There are no water quality performance indicators associated with this property.

The majority of the property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of tailings spill sites
- evidence of crown pillar subsidence
- evidence of subsidence over covered raises
- condition of the 2 stainless steel raise caps.

Although the lifespan of the stainless steel raise caps are estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

3.4.6 URA 4

The URA 4 property, 21.2 hectares in size, hosted the main Fay shaft and various support infrastructure. This property is located adjacent to property URA 7, where the mill was located. There are several openings to the underground workings on the property. The Fay shaft, vent raise, surface dump raise, and fine ore bin raise were all covered with stainless steel caps between 2017 and 2020. The backfilled custom ore raises and access to the custom crusher (adit) were secured using an engineered waste rock cover in 2020. The pipe drift raise, which was located in the bottom of the freshwater reservoir, was backfilled along with the freshwater reservoir during decommissioning.

Historic tailings spills occurred throughout the URA 4 property where the tailings pipelines were located, as shown on figure 3.6. As noted in section 3.4.2, with the participation of provincial and federal regulatory agency personnel, decisions were made during decommissioning to either remove, cover or cover (where accessible) tailings spill sites. Gamma radiation exposure rates were considered during the decision making. The tailings spill sites on the property were covered with approximately 0.6 metres of waste rock, where accessible.

The Fay/Ace/Verna underground mine workings extend under the property. Cameco has indicated that based on available information, the underground workings appear to be 25 metres, or more, below the ground surface. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Waste rock was used on the property for construction material and a portion of the Fay mine waste rock pile is located on the southern portion of the property. The Fay mine was reported to have produced a total of 3,030,000 tonnes of waste rock which covered an area of approximately 33 hectares. Waste rock testing of the Fay waste rock indicated that the uranium concentration in the rock was at or below 0.015% [21, 24], which is below the range for what is currently considered special/mineralized waste rock (>0.03% uranium). Visual observation and monitoring on the Beaverlodge properties for over 60 years has not identified any acid rock drainage leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition. The stability of waste rock piles at the Beaverlodge site was assessed in 2010 and is expected to remain stable [22]. CNSC staff reviewed and accepted the conclusions of the stability assessment.

There are no water quality performance indicators associated with this property. Ace Creek is immediately downslope of the southeastern portion of the property. Monitoring of water quality within Ace Creek will continue to be conducted by Cameco until such time as all area properties are transferred to the ICP. Ace Creek water quality predictions are discussed for those properties where water quality predictions apply.

The majority of the property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of waste rock
- condition of tailings spill sites
- evidence of subsidence over covered openings
- condition of the 4 stainless steel raise caps.

Although the lifespan of the stainless steel raise caps are estimated to be in the order of 1,200 years, an inspection and maintenance schedule has been established.

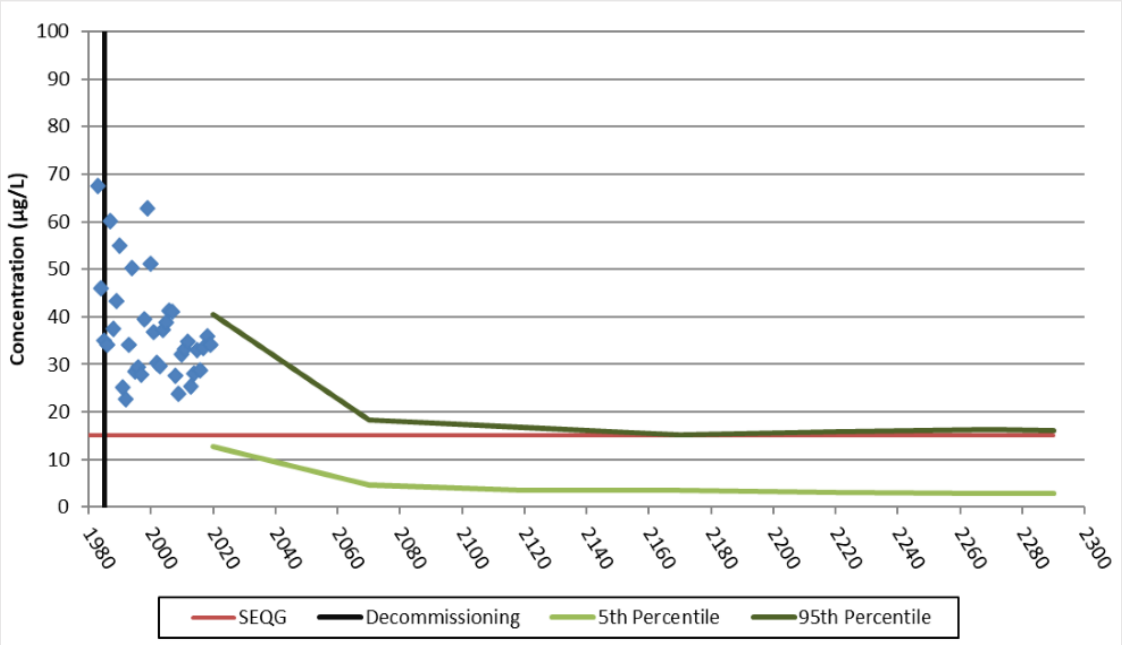
3.4.7 EXC URA 7

The EXC URA 7 property is 10.1 hectares in size and located on the lower reaches of Ace Creek. The property was not disturbed by mining activities; however, the property is located downslope of the Fay waste rock pile. Seeps have been observed at the base and downslope of the waste rock pile.

Sections of the Fay mine may extend over a portion of the property at a depth of more than 100 metres. A geotechnical assessment was completed and, due to the thickness and depth of the underground workings, the crown pillar was considered to have a low likelihood of subsidence [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Water quality predictions apply to this property and there are long term water quality predictions for radium-226, selenium and uranium at Lower Ace Creek at the discharge into Beaverlodge Lake (AC-14, figure 3.6). Figure 3.7 provides the long-term uranium predictions and water quality monitoring results. As selenium and radium-226 concentrations are currently below the *Saskatchewan Environmental Quality Guidelines* (SEQG) for freshwater aquatic life [23] and are predicted to remain so in the long term, a graph of the selenium and radium-226 predictions has not been included in this CMD. Figure 3.7 shows the upper (95th percentile) and lower (5th percentile) water quality prediction, water quality monitoring results and SEQG for uranium.

Figure 3.7: Long-term uranium predictions and water quality data for the outlet of Ace Creek



Uranium concentrations are expected to continually decline over the long term due to natural recovery, approaching the SEQG. Water quality measured at the outlet of Ace Creek is within the modelled predictions; therefore, the water quality performance indicator and acceptance criteria has been met for the property.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. There is no monitoring or maintenance proposed for the property; however, long term water quality monitoring at station AC-14 is expected once the remaining properties along Ace Creek have been transferred to the ICP.

3.4.8 URA FR

The URA FR is 6.3 hectares in size, adjacent to property EXC URA 7, and contains the lower reach of Ace Creek. As with property EXC URA 7, the property was not disturbed by mining activities, however the property is located downslope of the Fay waste rock pile. The property includes 2 boreholes, which exhibited artesian conditions that have been sealed, and 2 seeps downslope of the waste rock pile adjacent to the creek.

Sections of the Fay mine may extend over a portion of the property at a depth of more than 100 metres. A geotechnical assessment was completed and the crown pillar was considered to have a low likelihood of subsidence due to its thickness and depth of the underground workings [14]. No additional investigations were suggested. CNSC staff reviewed and accepted the geotechnical assessment conclusions.

Water quality performance indicators are applicable to this property. As with property EXC URA7, there are long term water quality predictions for the outlet of Ace Creek. To avoid duplication, this information has not been repeated. The water quality performance indicator and acceptance criteria has been met for this property.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- condition of vegetation
- condition of waste rock seeps
- evidence of flow from sealed boreholes.

Long term water quality monitoring at station AC-14 is expected once the remaining properties along Ace Creek have been transferred to the ICP.

There is no maintenance proposed for the property.

3.5 Tailings Management Area

The tailings management area (TMA) consisted of 26 properties. Cameco requested the release of 2 properties (GC 2 and EXC ACE 15) from CNSC licensing by removing the properties from appendix A of the Waste Facility Operating Licence, WFOL-W5-2120.1/2023. Figure 3.6 shows the properties and table 3.1 provides a summary of each property under consideration along with a comparison to the accepted performance indicators.

Inspections of both properties have been conducted and debris, if found, has been removed. No boreholes have been identified on either property.

3.5.1 GC 2

The GC 2 property is 20.4 hectares in size and located between the main road to the Verna mine site and the Marie Reservoir. There were no mining activities conducted on the property, however there are small areas along the west and southern portions of the properties where historic tailings spills occurred as result of the operation of a tailings pipeline on the property.

Upon decommissioning, these spill sites were left as is as they occurred in well vegetated areas. Decisions on individual spill areas were made with the participation of provincial and federal regulatory agency personnel. The decommissioning plan indicated that gamma exposure rates were considered during the decision making [8]. Based on the 2014 scan results [12], gamma radiation levels met the criteria identified in the Saskatchewan *Northern Mine Decommissioning and Reclamation Guidelines* [17].

In the 2014 CMD [3], CNSC staff indicated that water quality predictions applied due to the property being within the list of properties included in the TMA. All TMA properties were listed as having water quality predictions associated with them. Based on the documentation provided to, and field verification by, CNSC staff, CNSC staff concluded that the water quality performance indicator is not applicable to the property. There are no waterbodies present on the property and the presence of the small tailings spills on the edges of the property are not considered to be a significant source of the constituents of potential concern. The primary source of the constituents are attributed to the tailings and sediments in the TMA waterbodies [8]. The nearest downstream water quality monitoring station is at the outlet of Marie Reservoir. Currently, water quality at this station is meeting predictions; however, water quality monitoring will continue in all the TMA waterbodies and at stations where there are long term water quality predictions until the transfer of the waterbodies to the ICP.

The entire property is proposed for entry into the ICP, as shown on figure 3.6. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation
- condition of vegetation
- condition of tailings spill sites.

There are no structures requiring maintenance on the property.

3.5.2 EXC ACE 15

The EXC ACE 15 property is 2 hectares in size and is located south of the Marie Reservoir. No mining activities occurred and no tailings are present on the property. Due to the lack of disturbance on the property, the gamma radiation levels are considered to be natural background levels; therefore, a gamma radiation scan was not completed.

As previously discussed, the property was identified in 2014 by CNSC staff as having water quality predictions associated with it due to it being within the properties included in the TMA [3]. Based on the documentation provided to, and field verification by, CNSC staff, CNSC staff concluded that the water quality performance indicator is not applicable to the property. There are no waterbodies present on the property and CNSC staff inspections have confirmed that the property appears to have been undisturbed as a result of any mining and/or milling related activities.

Approximately half of the property is within the proposed ICP boundary along the south side of the Beaverlodge site; therefore, this portion of the property is proposed for entry into the ICP, as shown on figure 3.6. No inspections or maintenance activities are proposed for this property.

3.6 Environmental Protection Review

This licence amendment is not a designated project under the *Impact Assessment Act* (IAA), nor does it meet any of the other criteria necessitating an impact statement under the IAA[1]. CNSC staff performed an Environmental Protection Review (EPR) under the NSCA to determine if the established performance indicators and regulatory acceptance criteria were met for the properties under consideration. This section provides information specific to section 11 of the *General Nuclear Safety and Control Regulations* (GNSCR).

In accordance with section 11 of the GNSCR, the Commission may grant an exemption to the Government of Saskatchewan in accordance with section 7 of the NSCA, provided the conditions in section 11 of the GNSCR are met.

CNSC staff determined that Cameco's request, if granted, will not:

- pose an unreasonable risk to the environment or the health and safety of persons
- pose an unreasonable risk to national security
- result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.

CNSC staff have confirmed that the licensee has achieved the established performance indicators and regulatory acceptance criteria for the properties under consideration. Therefore, CNSC staff concluded that these properties do not pose an unreasonable risk to environment or the health and safety of persons. More information on CNSC staff's review as it relates to the environmental protection safety and control area can be found in section 4.7 of this CMD.

As described in section 1.2, two primary objectives of the ICP include the protection of human health and safety and the environment. This is achieved by land use controls, monitoring and maintenance, and funds for unforeseen events. The ICP is effective in ensuring oversight of the properties in the long term. The 18 properties, or portions thereof, that are to be transferred to the ICP will be monitored and managed by the Government of Saskatchewan. Therefore, these properties are expected to remain in a safe state and will not pose an unreasonable risk in the future.

Currently the licensee restricts access to tailings areas; however, access to other areas is unrestricted due to the remoteness and low risk nature of the site. National security is expected to be maintained for those properties transferred into the ICP due to the lack of an inventory of nuclear substances, remoteness and land use restrictions placed on the properties by the Government of Saskatchewan.

[1] The IAA can impose other requirements on federal authorities in respect of authorizing projects that are not designated as requiring an impact assessment, including projects that are to be carried out on federal lands, or projects outside of Canada. This licence amendment does not engage any such applicable IAA requirements.

The Government of Saskatchewan's ICP accords with Canada's international obligations relating to institutional control.

CNSC staff concluded that there has been, and will continue to be, adequate provision for the protection of the environment as a result of the release of these properties from licensing under the NSCA.

4. GENERAL ASSESSMENT OF SCAS

The CNSC implements a risk-informed approach in the regulation of nuclear facilities and activities. The depth of regulatory reviews of relevant safety and control areas (SCAs) and frequency of regulatory compliance activities are established by the risk rankings. The high-level definitions of each SCA are provided in section C.1 of this CMD. As noted earlier, the Beaverlodge Project is a decommissioned site and thus not all SCAs are applicable. Only those SCAs included in the Waste Facility Operating Licence WFOL-W5-2120.1/2023 are discussed.

The general assessment of relevant SCAs is only discussed in relation to the proposed release of properties from the CNSC licence, therefore, a detailed evaluation has not been undertaken.

4.1 Management System

The management system SCA covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, monitors its performance against these objectives and fosters a healthy safety culture. Cameco has an acceptable quality management program to ensure an effective management system. The quality management program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. During the current licence term, there were no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

4.2 Operating Performance

The operating performance SCA includes an overall review of the conduct of the licensed activities and the activities that enable effective performance. Cameco maintains the documentation and processes for an effective operating performance program, including the processes for the reporting of information to the CNSC. Cameco's operating performance program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. During the current licence term, there were no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

4.3 Safety Analysis

The safety analysis SCA includes the systematic evaluation of the potential hazards associated with the proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards. Cameco maintains a safety analysis program. The safety analysis program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulatory acceptance criteria established have been met. The performance indicator associated with this SCA is the stability of the crown pillar, where applicable. This performance indicator is discussed in sections 2 and 3 of this CMD.

During the current licence term, there was 1 event report for which this SCA was the main contributory factor. This event, observed in October 2013, was the ground surface subsidence above the crown pillar at the Ace 1 property. The safety significance of the event was considered low. A geotechnical assessment of the crown pillar stability at the site as a whole was undertaken from 2014 to 2015 to assess the potential for long term ground surface subsidence above the crown pillars and to investigate associated potential safety risks. Corrective actions and preventative measures were developed based on the assessment results, which were accepted by CNSC staff. This subsidence event was a contributing factor to the decision by CNSC staff to establish the stable crown pillar performance indicator which was presented to the Commission in 2014 [3].

The licensee's program in respect of this SCA remains satisfactory.

4.4 Physical Design

The physical design SCA relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account. Cameco maintains a physical design program. The physical design program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met.
The performance indicator associated with this SCA is stable mine openings. This performance indicator is discussed in sections 2 and 3.

During the current licence term, there were no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

4.5 Radiation Protection

The radiation protection SCA covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination levels and radiation doses received are monitored, controlled, and kept as low as reasonably achievable (ALARA) with social and economic factors being taken into account. There are no full time workers at the site and most maintenance and monitoring work is completed by contractors. Radiation doses to workers and contractors are estimated to be well below the dose limit of 1 mSv per calendar year for persons who are not nuclear energy workers.

The overall radiation risks for workers and the public accessing the decommissioned Beaverlodge mine and mill site are low because of the low levels of radiation. The radiological risks for non-routine work activities are assessed by completing a Job Hazard Analysis and, if required, radiation protection measures are implemented in accordance with the Beaverlodge Facility Licensing Manual.

The radiation protection program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. The performance indicator associated with this SCA is acceptable gamma levels and is discussed in sections 2 and 3 of this CMD.

During the current licence term, there were no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

4.6 Conventional Health and Safety

The conventional health and safety SCA covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment. There are no full time workers at the site and most maintenance and monitoring work is completed by contractors. Cameco maintains a conventional health and safety program; however, this program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. During the current licence term, there was 1 event related to this SCA as described in section 4.3.

The licensee's program in respect of this SCA remains satisfactory.

4.7 Environmental Protection

The environmental protection SCA covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities. Cameco maintains an environmental protection program; however, this program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. The performance indicators associated with this SCA are as follows: water quality within modelled predictions; boreholes plugged; and site free from debris. These performance indicators are discussed in sections 2 and 3.

During the current licence term, there was 1 event related to this SCA. The event was the release of high turbidity/total suspended solids water during the Bolger flow path remediation project where waste rock was relocated to re-establish the creek between Zora and Verna Lakes. During the August 9, 2015 excavation of frozen waste rock/water, a rapid increase in water flow from the excavation area occurred causing water to overflow the settling basin and silt curtains, resulting in water with elevated solids entering a bay of Verna Lake. Both provincial and federal agencies were notified of the event.

There were no impacts to the environment observed as a result of the event and it was considered to be of low safety significance by CNSC staff. The corrective actions and preventative measures implemented by Cameco during the remainder of the project as a result of the event were accepted by CNSC staff.

Environmental Risk Assessment

In support of releasing the properties from the CNSC-issued licence, Cameco provided a revised environmental risk assessment (ERA) to their 2018 version. The updated 2020 ERA contained revised surface water quality performance indicators; assessed using a different model and more recent water samples [15].

CNSC staff reviewed the 2020 Beaverlodge ERA to assess the updated risks and conclusions using water quality results and predictions of the new model. CNSC staff concluded that the updated surface water quality indicators are appropriate to assess the performance of the Beaverlodge site and that predictions remain largely unchanged from previous assessments.

The licensee's program in respect of this SCA remains satisfactory.

4.8 Emergency Management and Fire Protection

The emergency management and fire protection SCA covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. While Cameco has an emergency preparedness program, this program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met. During the current licence term, there were no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

4.9 Safeguards and Non-Proliferation

The safeguards and non-proliferation SCA covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*. Cameco maintains a safeguards program and complies with *CNSC's REGDOC-2.13,1, Safeguards and Nuclear Material Accountancy* for those sections applicable to the decommissioned site. Cameco's program was not evaluated as part of the CNSC staff assessment as the licence amendment request is specifically related to whether the established performance indicators and regulator acceptance criteria established have been met.

Regarding the decommissioned site, there is no requirement for the licensee to provide routine access and information for safeguards purposes. Under the safeguards agreements, the IAEA may request access to a decommissioned site and reasonable support and assistance must be provided. During the 2013 to 2020 period, there were no requests by IAEA inspectors to access the Beaverlodge site and no event reports for which this SCA was the main contributory factor.

The licensee's program in respect of this SCA remains satisfactory.

5. INDIGENOUS AND PUBLIC CONSULTATION AND ENGAGEMENT

5.1 Indigenous Consultation and Engagement

The common law duty to consult with Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or treaty rights. The CNSC is committed to meaningful engagement with Indigenous Nations and communities who have an interest in CNSC regulated facilities and activities. In support of the request for release of 18 Beaverlodge properties, CNSC staff identified First Nation and Métis groups who may have an interest in the Beaverlodge site. The CNSC ensures that all of its licensing decisions under the NSCA uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the *Constitution Act*, 1982.

5.1.1 Discussion

CNSC staff have identified the following First Nation and Métis groups who may have an interest in the proposed licence renewal:

- Ya'thi Néné Lands and Resource Office (representing Black Lake, Hatchet Lake, and Fond du Lac Denesuline First Nations as well as the municipalities of Stony Rapids, Uranium City, Wollaston Lake, and Camsell Portage)
- Black Lake Denesuline First Nation
- Hatchet Lake Denesuline First Nation
- Fond du Lac Denesuline First Nation
- Athabasca Chipewyan First Nation
- Métis Nation Saskatchewan (Northern Region 1: Métis Local #50 – Uranium City & Métis Local #80 – Stony Rapids)
- Prince Albert Grand Council

In addition, the Northern Saskatchewan Environmental Quality Committee (NSEQC) was also flagged as potentially having an interest in the project. The NSEQC has representatives from a majority of the northern municipal and First Nation communities located in the Northern Saskatchewan Administration District.

These groups and organizations were identified because they have all previously expressed interest in being kept informed of CNSC licensed activities occurring in their treaty lands and/or asserted traditional territories in relation to uranium mines and mills, including decommissioned sites, in northern Saskatchewan.

CNSC staff have been engaging with a number of the identified Indigenous Nations and communities concerning the Beaverlodge properties and the Government of Saskatchewan's ICP since 2009. In relation to Cameco's current proposed request, CNSC staff sent letters of notification on August 5, 2021 to the identified groups providing information regarding the proposed release of licensed properties, the transfer of properties to provincial institutional control, the availability of participant funding and details on how to participate in the Commission's public hearing process. Follow-up phone calls were conducted in August 2021 to ensure receipt of the letters and to answer any questions. In the fall of 2021, CNSC staff sent emails to the identified Indigenous Nations and communities offering to organize virtual meetings and to be available to answer any questions they may have with respect to the Beaverlodge sites. All of the identified Indigenous Nations and communities were encouraged to participate in the Commission's public hearing process in order to advise the Commission directly of any concerns they may have in relation to this decision-making matter.

To date, no issues have been raised by the identified Indigenous Nations and communities related to potential impacts on Indigenous and/or treaty rights as a result of the release of Beaverlodge properties. CNSC staff are committed to continuing to address any concerns that are raised and to provide information pertaining to the project. Follow-up activities will be conducted with Indigenous Nations and communities who express any remaining concerns about the facility following the Commission hearing, where necessary.

CNSC's REGDOC-3.2.2, *Indigenous Engagement*, published in August 2019, sets out requirements and guidance for licensees whose proposed projects may raise the Crown's duty to consult. While the CNSC cannot delegate its obligation, it can delegate procedural aspects of the consultation process to licensees. The information collected and measures proposed by licensees to avoid, mitigate or offset adverse impacts may be used by the CNSC in meeting its consultation obligations.

As Cameco's request to release 18 properties from CNSC regulatory oversight does not propose any new activities that could potentially impact Indigenous and/or treaty rights, the requirements of REGDOC-3.2.2 do not apply. However, CNSC staff encourage Cameco to continue to keep interested Indigenous Nations and communities informed of the transfer of properties to the ICP and any on-going activities of interest to these communities.

5.1.2 Conclusion

Based on the information received and reviewed, CNSC staff have concluded that this licence amendment application will not cause adverse impacts to any potential or established Indigenous and/or treaty rights. However, the identified Indigenous Nations and communities have been notified and encouraged to participate in the process and in the Commission's public hearing, thus providing them the opportunity to advise the Commission directly of any concerns they may have in relation to this request.

5.2 Other Consultation

As per its normal public notification process for Commission proceedings, CNSC staff informed the public via the CNSC's website, email subscription list, social media channels, radio and print advertisements in local communities in northern Saskatchewan of the public Commission hearing and availability of participant funding.

The CNSC also regularly participates in information sessions in the Northern Settlement of Uranium City. Information sessions have been conducted annually in Uranium City in recent years, with the exception of 2020. Due to the COVID-19 pandemic, a public meeting could not be held in 2020, however CNSC staff participated in a virtual information session that Cameco conducted on November 18, 2020. CNSC staff presented and participated in the coordinated response to follow-up questions posed following the engagement session. This session was advertised locally to Uranium City community residents, and invitations were sent to First Nations and Métis community representatives.

In follow-up to the 2019 licence amendment hearing, the Commission recommended that annual updates be provided on engagement activities conducted by CNSC staff and Cameco specific to the Beaverlodge Project [5]. The outreach session was provided virtually in September 2020 by CNSC staff to Indigenous Nations and communities on the Beaverlodge Project on the *Regulatory Oversight Report for Uranium Mines, Mills, Historic, and Decommissioned Sites in Canada: 2020* [28]. This regulatory oversight report is scheduled to be presented to the Commission as CMD-M34 on December 15, 2021. A brief summary of these engagement activities is discussed below.

Although the COVID-19 pandemic limited in-person meetings and onsite tours, both Cameco and CNSC staff continued proactive engagement actions related to the Beaverlodge Project in 2020 and 2021. As part of engagement activities and in follow-up to the 2019 Commission hearing, Cameco and the CNSC increased communications regarding Beaverlodge related activities with the Athabasca Chipewyan First Nation (ACFN) to better understand their concerns and continue to share information related to the Beaverlodge Project. These efforts included phone calls, emails and mailed correspondence in an effort to engage the ACFN on the Beaverlodge Project.

The most recent Beaverlodge information session with Indigenous Nations and communities, including Uranium City residents, was conducted on November 2, 2021. The session was conducted virtually due to the continuing COVID-19 pandemic safety restrictions. These sessions provided information on the proposed transfer of properties at the Beaverlodge site to the ICP. Presentations were made by Cameco, the Saskatchewan Ministry of Energy and Resources (SMER), Saskatchewan Ministry of Environment (SMOE) as well as the CNSC. CNSC staff provided an overview of the organization and described the regulatory requirements that must be met for properties to be released from CNSC licensing. A recording of the November 2, 2021 session is available on the Beaverlodge website.

5.2.1 Discussion

Through CNSC's Participant Funding Program (PFP), up to C$75,000 was made available to assist members of the public, Indigenous Nations and communities, and stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review Cameco's application and associated documents and to prepare for, and participate in, the Commission's public hearing.

The deadline for applications was October 1, 2021. A Funding Review Committee (FRC), independent from CNSC staff, reviewed the applications received, and made recommendations on the allocation of funding to eligible applicants. Based on recommendations from the FRC, the CNSC awarded participant funding to the following recipients, as shown on table 5.1.

Table 5.1: Beaverlodge Project - PFP funding awarded

Applicant	Maximum funding award
Ya'thi Néné Lands and Resource Office	$35,000
Saskatchewan Environmental Society	$8,150
Métis Nation - Saskatchewan	$35,000
TOTAL	**$78,150**

5.2.2 Conclusion

Based on the above information, CNSC staff followed its process and the public have been encouraged to participate in the Commission's public hearing. The CNSC offered assistance to interested members of the public, Indigenous Nations and communities, and other stakeholders, through the PFP, to prepare for and participate in the Commission's public hearing.

5.3 Licensee Public Information Program

Uranium mines and mills are required to implement public information programs, in accordance with CNSC's REGDOC-3.2.1, *Public Information and Disclosure*. These programs are supported by disclosure protocols which outline the type of information on the facility and its activities that will be shared with the public (e.g., incidents, major changes to operations, periodic environmental performance reports) and how that information will be shared. The objective is to ensure that timely information about the health, safety and security of persons and the environment and other issues associated with the lifecycle of the nuclear facility are effectively communicated.

At the request of CNSC staff and in preparation for future licensing hearings for the Beaverlodge Project, Cameco submitted a revised Public Information Program (PIP). CNSC staff reviewed and determined that this revised PIP is in full compliance and includes all necessary requirements under CNSC's REGDOC-3.2.1.

It is CNSC's staff's conclusion that Cameco has a strong PIP for the Beaverlodge Project that takes into account its unique audience challenges in remote communities. This has been demonstrated by the licensee through numerous activities including ongoing community engagement, mailers, newsletters and online content that is generated regularly. The licensee has made many efforts to continuously improve and maintain communication with those interested in and concerned about the Beaverlodge site.

In addition, CNSC staff have confirmed that the licensee has undertaken regular public opinion surveys in northern Saskatchewan to help determine the effectiveness of its public information activities.

6. OTHER MATTERS OF REGULATORY INTEREST

6.1 Existing Financial Guarantee

All costs associated with the management of the decommissioned Beaverlodge mine and mill site are paid by Canada Eldor Inc., a wholly-owned subsidiary of Canada Development Investment Corporation. Both Canada Eldor Inc. and Canada Development Investment Corporation report to the Federal Minister of Finance. The Department of Finance has provided written confirmation to the CNSC that: *Canada Eldor Inc. is an agent of the Crown in right of Canada for all purposes. It follows that any undischarged obligations and liabilities of Canada Eldor Inc. are the obligations and liabilities of the Crown in right of Canada. That will include Canada Eldor Inc.'s obligations and liabilities to decommission the Beaverlodge Site and the expenses associated with possession, management and control of nuclear substances at that site* [29]. The CNSC accepted that the information fulfills the requirement of condition 10.1 (maintenance of a financial guarantee) within Waste Facility Operating Licence, WFOL-W5-2120.1/2013.

The request to release 18 properties from the Beaverlodge Project Waste Facility Operating Licence will not impact the existing financial guarantee arrangement for the remaining properties.

6.2 Property Usage by Uranium City Residents

In order to determine a reasonable approximation of the time each person spent on the former Beaverlodge properties, a door-to-door survey was conducted to gather information from the community residents regarding their use of the areas around Uranium City. This December 2014 survey was conducted in Uranium City by consultants retained by Cameco. The focus of the interviews was on land use in the 5 years before the survey was conducted and expected land use in the foreseeable future. The results of the survey were combined into a land use report which was submitted to the CNSC in April 2015 [26]. The interviews focussed on determining the properties that people travel to, amount of time spent on the properties, what age groups frequent the properties and the types of activities conducted on the properties. The information on land use was used to assess risk from potential gamma exposure, where required.

The program included interviews of representatives from 21 of the 34 reportedly active Uranium City households. The other households did not participate because the residents either declined to be interviewed (4), were out of town during the survey period and were unreachable (5), or were believed to be in town but unavailable to participate (4). This represents a 62% participation rate which was considered good for this type of survey instrument.

The survey found that the maximum reported recreational use of any of the Beaverlodge properties and Saskatchewan Research Council managed properties by Uranium City residents did not exceed 50 hours per year over the 5-year study period.

In a response to information provided by the Athabasca Chipewyan First Nation (ACFN) during the October 2019 Commission hearing [5], Cameco has been attempting to engage ACFN on potential usage by their members of the Beaverlodge site and initiate regular dialogue, however the risk assessment conclusion that living a traditional lifestyle and consuming country foods can be done safely remains valid.

6.3 Timeline for Remaining Beaverlodge Properties

In 2014 Cameco compiled property-by-property timeline estimates for institutional control transfer eligibility, which were reviewed and accepted by CNSC staff. This information was presented to the Commission in CMD 14-M60 [3]. At the time, the planned timeline for requests for transfer to the ICP ranged from 2015 to 2023 (the expiry of the current CNSC-issued licence), with the properties in the former tailings management area being the last properties to be transferred to the ICP.

Due to a number of factors, including CNSC and the Government of Saskatchewan review time for submissions, the majority of the properties scheduled for transfer to the ICP between 2015 and 2017 were presented to the Commission in 2019. Also, rather than a staged request for the remaining 45 properties, Cameco submitted the current application for the transfer of 18 properties. If the current request is accepted, it is anticipated that Cameco will submit an application for a 2-year licence extension (licence expires May 31, 2023). This potential application for a licence extension is expected in order to allocate time for the request for the release of the remaining 27 properties to be prepared and reviewed by SMOE and CNSC staff, as well as to prepare the documentation for a public hearing.

6.4 Long Term Monitoring and Maintenance

As noted in section 1.2, in order for properties to enter into the ICP, the licensee must provide the funds for long term monitoring, maintenance and unforeseen events. The Government of Saskatchewan will use these funds to provide the long term oversight of these properties.

The long term monitoring and maintenance activities for each property after entering into the ICP were described in sections 3.1 through 3.6. These monitoring and maintenance activities were used by Cameco to determine the funding commitment required by the Government of Saskatchewan in order for the properties to be accepted into the ICP.

There are currently 24 Beaverlodge properties in the ICP. Therefore, the costs for monitoring and maintenance for the properties under consideration include some savings by combining items such as mobilization costs for inspecting the 18 properties with the properties currently in the ICP. Although approval of these costs is the responsibility of SMER, CNSC and SMOE staff reviewed the proposed monitoring program and costs. SMER has also established financial guidance for licensees to use to determine contributions to the monitoring and maintenance fund.

The monitoring costs for the properties are based on inspections to be conducted in 2024, 2029, 2034, 2044, 2054, 2064, 2074, 2089, 2099, 2114, 2121 and every 25 years thereafter. The 2021 net present value of the contribution for the monitoring and maintenance of the 18 properties (or portions thereof) in the ICP is C$230,092.19. The monitoring schedule is proposed to start in 2024 to align with the monitoring program for those properties already under institutional control.

Prior to entering into the ICP, SMER will require that Cameco review and update the cost estimate to ensure that the 2022 net present value is used in the final cost estimate.

The maximum potential failure event for the properties under consideration has been assumed to be the premature stainless steel shaft cap failure. Currently SMER requires the licensees provide financial assurance for any unforeseen events. However, as the financial liability for the former Beaverlodge site lies with the Government of Canada, a financial assurance may not be required by the province. Should the province decide that financial assurance is not required, it is expected that they will require an acknowledgement of this liability by Canada Eldor Inc.

7. OVERALL CONCLUSIONS AND RECOMMENDATIONS

Cameco submitted a request to have 18 properties released from CNSC licensing. Cameco has stated that all properties meet the performance objectives for the decommissioned Beaverlodge site: safe, secure, and stable/improving. The actual performance indicators and regulatory acceptance criteria which were defined to ensure these performance objectives are met have also been achieved. This information is explained in greater detail in section 2. CNSC staff have concluded that the applicable indicators and criteria have been achieved for these 18 properties.

CNSC staff have completed their technical review and concur that the request to release the properties from the CNSC licence meets all regulatory requirements. According to section 3(f) of *The Reclaimed Industrial Sites Regulations,* an exemption is required for the province before properties can be transferred into the ICP.

An environmental protection review under the NSCA was conducted for this application as described in section 3.6 of this CMD. CNSC staff concluded that there has been, and will continue to be, adequate provision for the protection of the environment if the Commission decides to release these properties from licensing under the NSCA, in order to enable the transfer of the properties to the Government of Saskatchewan's ICP.

7.1 Overall Recommendations

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.1/2023 to remove 18 properties from the figure within appendix A; and
- exempt the Government of Saskatchewan from licensing under section 7 of the *Nuclear Safety and Control Act* for the 18 properties proposed for transfer into Saskatchewan's Institutional Control Program.

The 18 properties under request for exemption and release are the HAB 1, EXC 1, HAB 2, EMAR 1, ACE 7, ACE 8, NW 3 Ext, NW 3, ACE 3, ACE 14, ACE MC, ACE 9, ACE 1, URA 4, EXC URA 7, URA FR, GC 2 and EXC ACE 15.

REFERENCES

1. CMD 13-H4. *Cameco Corporation, The Decommissioned Beaverlodge Mine and Mill Site, Licence Renewal*, One-Day Public Hearing, April 4, 2013. Submitted by CNSC staff (e-Doc 4051442).
2. *Record of Proceedings, Including Reasons for Decision In the Matter of Cameco Corporation, Application to Renewal Waste Facility Operating Licence at Decommissioned Beaverlodge Mine and Mill Site*, Public Hearing Dates April 3-4, 2013.
3. CMD 14-M60. Commission Request for Information, *Cameco Corporation, The Decommissioned Beaverlodge Mine and Mill Site*, Public Meeting October 1, 2014, Submitted by CNSC staff (e-Doc 4438227).
4. CMD 19-H6. A Licence Amendment – *Cameco Corporation – Request for Release of 20 Beaverlodge Properties from Requiring Licensing under the Nuclear Safety and Control Act*. Public Hearing October 2, 2019.
5. Record of Decision, DEC 19-H6, *In the Matter of Cameco Corporation Application to remove 20 properties from Beaverlodge Waste Facility Operating Licence to enable the transfer of 19 properties into the Saskatchewan Institutional Control Program*, Public Hearing October 2, 2019, December 19, 2019.
6. CMD 18-M38. Technical Briefing, Commission Request for Information, *Overview of the Institutional Control Program for Decommissioned Mine and/or Mill Sites in Saskatchewan*. Public Meeting October 3, 2018 (e-Doc 5582892).
7. *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, International Atomic Energy Agency, June 2001.
8. Final Closure Report, Beaverlodge Properties ACE 1, ACE 3, ACE 7, ACE 8, ACE 9, ACE 14, ACE MC, EXC ACE 15, EXC URA 7, GC 2, NW 3 Ext, NW 3, URA FR, EMAR 1, EXC 1, HAB 1, and HAB 2. Kingsmere Resource Services Inc., January 2021 (e-Doc 6468525, response to review comments provided in e-Doc 6542932).
9. Letter to M. Leblanc (CNSC) from L. Mooney (Cameco) *re: Decommissioned Beaverlodge Properties: Request for Licence Amendment of WFOL-W5-2120.0/2023*, July 14, 2021.
10. Letter to M. Webster (Cameco) from G. Bihun (SMOE*), re:* Letter of Intent to Release Beaverlodge Properties ACE 1, ACE 3, ACE 7, ACE 8, ACE 9, ACE 14, ACE MC, EXC 1, EXC ACE 15, EXC URA 7, GC 2, NW 3 Ext, NW 3, URA 4, URA FR, EMAR 1, HAB 1 and HAB 2. August 30, 2021. (e-Doc 6631803).
11. Letter to R. Snider (CNSC) from D. Zmetana (SMER), re: Letter of Intent to Accept Beaverlodge Properties ACE 1, ACE 3, ACE 7, ACE 8, ACE 9, ACE 14, ACE MC, EXC 1, EXC ACE 15, EXC URA 7, GC 2, NW 3 Ext, NW 3, URA 4, URA FR, EMAR 1, HAB 1 and HAB 2 into Saskatchewan's Institutional Control Program (ICP). July, 8, 2021. (e-Doc 6603093).

12. Surficial Gamma Radiation Survey of Disturbed Areas at the Former Beaverlodge Mine Site, ARCADIS SENES Canada Inc., November 2014 (e-Doc 4588292).

13. Beaverlodge Site Gamma Radiation Risk Evaluation, ARCADIS SENES Canada Inc., June 2015 (4798829).

14. Beaverlodge Property – Crown Pillar Assessment (2014-2015), SRK Consulting (Canada) Inc., July 2015 (e-Doc 4814188).

15. Decommissioned Beaverlodge Mine Site: Model Update and Environmental Risk Assessment, Canada North Environmental Services, July 2020. Submitted September 8, 2020 (e-Doc 6379444).

16. Email to M. Webster (Cameco) from R. Snider (CNSC), Beaverlodge Project – Submission from Cameco on Borehole Grout Longevity – CNSC Response, July 15, 2020 (e-Doc 6344972).

17. *Northern Mine Decommissioning and Reclamation Guidelines*, EPB 381, Ministry of Environment, Government of Saskatchewan, November 2008.

18. Letter to R. Snider (CNSC) from M. Webster (Cameco), Decommissioned Beaverlodge Properties: 2019 Commission Hearing Follow-up, June 23, 2021 (e-Doc 6593761).

19. Pit Slope Stability Inspection Report, SRK Consulting (Canada) Inc., December 2010 (e-Doc 3668048).

20. Final Closure Report, Beaverlodge Properties HAB 3, HAB 6, EXC 2 RA6, RA 9, EAGLE 1, BOLGER 2, ATO 26, EXC ATO 26, URA MC, EXC ACE 1, ACE 10, ACE 2 & EXC ACE 3, Kingsmere Resource Services Inc., March 2016 (e-Doc 4977527).

21. ASKI Resource Management and Environmental Services LP. 2011 Beaverlodge In Situ Tailings & Waste Rock Sampling Program Report. Prepared for Cameco Corporation, November 2011 (e-Doc 6492966).

22. Waste Rock Stability Assessments Former Eldorado Beaverlodge Sites, SRK Consulting (Canada) Inc., December 2010 (e-Doc 3668058).

23. *Saskatchewan Environmental Quality Guidelines* (https://envrbrportal.crm.saskatchewan.ca/seqg-search/).

24. Decommissioning of the Beaverlodge Mine/Mill Operations and Reclamation of the Site, Report No. 2, Operating History and Environmental Conditions, MacLaren Plansearch, Eldorado Resources Limited, February 1983 (e-Doc 6509908).

25. Letter to R. Snider (CNSC) and G. Bihun (SMOE), Beaverlodge Up and Watson Lakes Supporting Information, December 2, 2020 (e-Doc 6436442).

26. 2014 Uranium City Consultation on Land Use, SENES Consultants & Kingsmere Resources Services, January 2015 (e-Doc 4714309).

27. Email to R. Snider (CNSC) from M. Webster (Cameco), Beaverlodge Project Inspection Reports No. CAMECO-BVL-2020-01 and CAMECO-BVL-2021-01, October 15, 2021 (e-Doc 6660983).

28. CMD 21-M34. *Regulatory Oversight Report for Uranium Mines, Mills, Historic and Decommissioned Sites in Canada: 2020*, October 2021.

29. Letter to R. Ferch (CNSC) from R. Phillips (Cameco), *Beaverlodge Project: Financial Assurance for Cameco Corporation, Beaverlodge Decommissioned Mine and Mill Site, Northern Saskatchewan*, June 9, 2005 (e-Doc 1260110).

GLOSSARY

Acronyms

ACFN	Athabasca Chipewyan First Nation
ALARA	As low as reasonably achievable
Cameco	Cameco Corporation
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
EPR	Environmental Protection Review
ERA	Environmental Risk Assessment
FRC	Funding Review Committee
GNSCR	*General Nuclear Safety and Control Regulations*
JRG	Joint Regulatory Group
IAA	*Impact Assessment Act*
IAEA	International Atomic Energy Agency
ICMMF	Institutional Control Monitoring and Maintenance Fund
ICP	Institutional Control Program
ICUEF	Institutional Control Unforeseen Events Fund
LCH	Licence Conditions Handbook
NSCA	*Nuclear Safety and Control Act*
NSEQC	Northern Saskatchewan Environmental Quality Committee
QSM	Quantitative Site Model
PFP	Participant Funding Program
PIP	Public Information Program
SCA	Safety and Control Area
SEQG	*Saskatchewan Environmental Quality Guidelines*
SMER	Saskatchewan Ministry of Energy and Resources
SMOE	Saskatchewan Ministry of Environment
TMA	Tailings Management Area

Terms

Adit	An entrance to an underground mine which is horizontal or nearly horizontal
Crown Pillar	The rock mass between the uppermost mine working and the ground surface
DorrClone	DorrClone is a Dutch States Mines cyclone. It is a cyclone used to separate particles (tailings at the Beaverlodge Project) through the use of centrifugal force.
Raise	A vertical or near vertical excavation to an underground mine used for ventilation and/or emergency escape
Shaft	A narrow vertical hole used to access an underground mine
Subsidence	The caving or sinking of the land surface

A. BASIS FOR THE RECOMMENDATION(S)

A.1 Regulatory Basis

The regulatory basis for the matters that are relevant to this CMD are as follows.

Nuclear Safety and Control Act

Section 7 of the *Nuclear Safety and Control Act* states that the Commission may, in accordance with the regulations, exempt any activity, person, class of person or quantity of a nuclear substance, temporarily or permanently, from the application of this Act or the regulations or any provision thereof.

Paragraph 24(2)(a)(b) of the *Nuclear Safety Control Act* provides that the Commission may issue, renew, suspend in whole or in part, amend, revoke or replace a licence, or authorize its transfer, on receipt of an application; (a) in the prescribed form; (b) containing the prescribed information and undertakings and accompanied by the prescribed documents.

Subsection 24(5) of the *Nuclear Safety Control Act* provides that a licence may contain any term or condition that the Commission considers necessary for the purposes of this Act., including a condition that the applicant provide a financial guarantee in a form that is acceptable to the Commission.

General Nuclear Safety and Control Regulations

Section 11 of the *General Nuclear Safety and Control Regulations* states that for the purpose of section 7 of the Act, the Commission may grant an exemption if doing so will not

(a) pose an unreasonable risk to the environment or the health and safety of persons;

(b) pose an unreasonable risk to national security; or

(c) result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed.

A.2 Technical Basis

Staff's recommendations to the Commission within this CMD are supported on a technical basis and comparison by the following documents:

- *CNSC REGDOC-2.11.1: Waste Management, Volume I: Management of Radioactive Waste* (January 2021) *and* *Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings* (November 2018), Canadian Nuclear Safety Commission.
- *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, International Atomic Energy Agency, June 2001.
- *Management of Radioactive Waste from the Mining and Milling of Ores, Safety Guide*, Safety Standards Series No. WS-G-1.2, International Atomic Energy Agency, March 2002.
- *Monitoring and Surveillance of Residues from the Mining and Milling of Uranium and Thorium*, Safety Report Series No. 27, International Atomic Energy Agency, 2002.
- *Disposal of Radioactive Waste*, Specific Safety Requirements No. SSR-5, International Atomic Energy Agency, 2011.
- *Near Surface Disposal of Radioactive Waste*, Specific Safety Guide No. SSG-29, International Atomic Energy Agency, March 2014.
- *Release of Sites from Regulatory Control on Termination of Practices*, Safety Guide No. WS-G-5.1, International Atomic Energy Agency, March 2006.
- *Decommissioning of Facilities*, General Safety Requirements Part 6 No. GSR Part 6, International Atomic Energy Agency, March 2014.

B. CAMECO'S INSTITUIONAL CONTROL TRANSFER TIMELINE

Property Information		Planned Timelines For Meeting Performance Indicators						Timeline for transfer to ICP
Property Number	Area (hectares)	Acceptable Gamma Levels	Boreholes Sealed	Stable Mine Openings	Stable Crown Pillar	Site Free From Debris	Water Quality Indicators met	
Verna/Bolger								
BOLGER 1	11.5	Complete	Complete	n/a	n/a	Complete	Monitor AC-6A through 2022	2023
Lower Ace Creek								
URA 1	17.5	Complete	Complete	n/a	Complete	Complete	Monitor AC-14 through 2022	2023
URA 7	20.9	Complete	n/a	2019-20	Complete	Complete	Monitor AC-14 through 2022	2023
Tailings Management Area								
EXC URA 6	6	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2023
ACE 19	15.8	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2023
URA 6	20.7	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2023
EXC ACE 18	20.7	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2023
EXC ACE 17	11.9	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2023
ACE 17	21.2	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
ACE 15	23.6	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
EXC ACE 14	16.1	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
GORE	7.1	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
EXC GC 2	7.4	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
GC 4	18.9	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
EXC GC 4	6.6	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2023
GC 3	21	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
EXC GC 3	5.3	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
GC 5	19.2	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
GC 1	16.4	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
GORE 1	2.1	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
NW 2	15.3	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
NW 1	18.5	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
LEE 4	11.3	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
GORE 2	11.3	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
LEE 3	21.8	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
EXC LEE 3	21.9	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023
LEE 2	16.3	Complete	n/a	n/a	n/a	Complete	Monitoring TL-3 through 2022	2023

C. SAFETY AND CONTROL AREA FRAMEWORK

C.1 Safety and Control Areas Defined

The CNSC's safety and control areas are comprised of specific areas of regulatory interest which vary between facility types.

The following table provides a high-level definition of each SCA. The specific areas within each SCA are to be identified by the CMD preparation team in the respective areas within section 4 of this CMD

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	**Safety and Control Area**	**Definition**
Management	Management System	Covers the framework which establishes the processes and programs required to ensure an organization achieves its safety objectives and continuously monitors its performance against these objectives and fostering a healthy safety culture.
	Human Performance Management	Covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
	Operating Performance	This includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.
Facility and Equipment	Safety Analysis	Maintenance of the safety analysis that supports that overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.
	Physical Design	Relates to activities that impact on the ability of systems, components and structures to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.
	Fitness for Service	Covers activities that impact on the physical condition of systems, components and structures to ensure that they remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	**Safety and Control Area**	**Definition**
Core Control Processes	Radiation Protection	Covers the implementation of a radiation protection program in accordance with the *RP Regulations*. This program must ensure that contamination and radiation doses received are monitored and controlled.
	Conventional Health and Safety	Covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.
	Environmental Protection	Covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.
	Emergency Management and Fire Protection	Covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. This also includes any results of exercise participation.
	Waste Management	Covers internal waste-related programs which form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. Also covers the planning for decommissioning.
	Security	Covers the programs required to implement and support the security requirements stipulated in the regulations, in their licence, in orders, or in expectations for their facility or activity.
	Safeguards and Non-Proliferation	Covers the programs and activities required for the successful implementation of the obligations arising from the Canada/IAEA safeguards agreements as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*.
	Packaging and Transport	Programs that cover the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility.

PART TWO

Part Two provides all relevant information pertaining directly to the licence, including:

1. The current waste facility operating licence
2. Proposed licence changes
3. The proposed draft waste facility operating licence
4. The proposed draft licence conditions handbook

CURRENT LICENCE

The current licence is provided on the following pages of the document.

WASTE FACILITY OPERATING LICENCE
CAMECO CORPORATION
BEAVERLODGE

I) LICENCE NUMBER: WFOL-W5-2120.1/2023

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

Cameco Corporation
2121 – 11th Street West
Saskatoon, Saskatchewan S7M 1J3
Corporate Number 332981-0

III) LICENCE PERIOD: This licence is valid from June 1, 2013 to May 31, 2023, unless suspended, amended, revoked or replaced.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to possess, manage and store, the nuclear substances associated with the decommissioned Beaverlodge mine and mill site located in the province of Saskatchewan, as shown in the figure contained in Appendix A to this licence.

V) EXPLANATORY NOTES:

a) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.

b) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and its associated Regulations.

c) The WFOL-W5-2120.1/2023 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission staff to assess the licensee's compliance with the conditions listed in this licence. The LCH also provides information regarding delegation of authority and applicable version control of documents comprising compliance verification criteria.

VI) CONDITIONS:

G. GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1. MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

2. OPERATING PERFORMANCE

2.1 Operations Program

The licensee shall implement and maintain an operating program.

2.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

3. SAFETY ANALYSIS

3.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

4. PHYSICAL DESIGN

4.1 Design Program

The licensee shall implement and maintain a design program.

5. *RADIATION PROTECTION*

5.1 Radiation Protection Program

The licensee shall implement and maintain a radiation protection program.

6. *CONVENTIONAL HEALTH AND SAFETY*

6.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

7. ENVIRONMENTAL PROTECTION

7.1 Environmental Protection Program

The licensee shall implement and maintain an environmental protection program.

8. EMERGENCY MANAGEMENT

8.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

9. SAFEGUARDS AND NON-PROLIFERATION

9.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

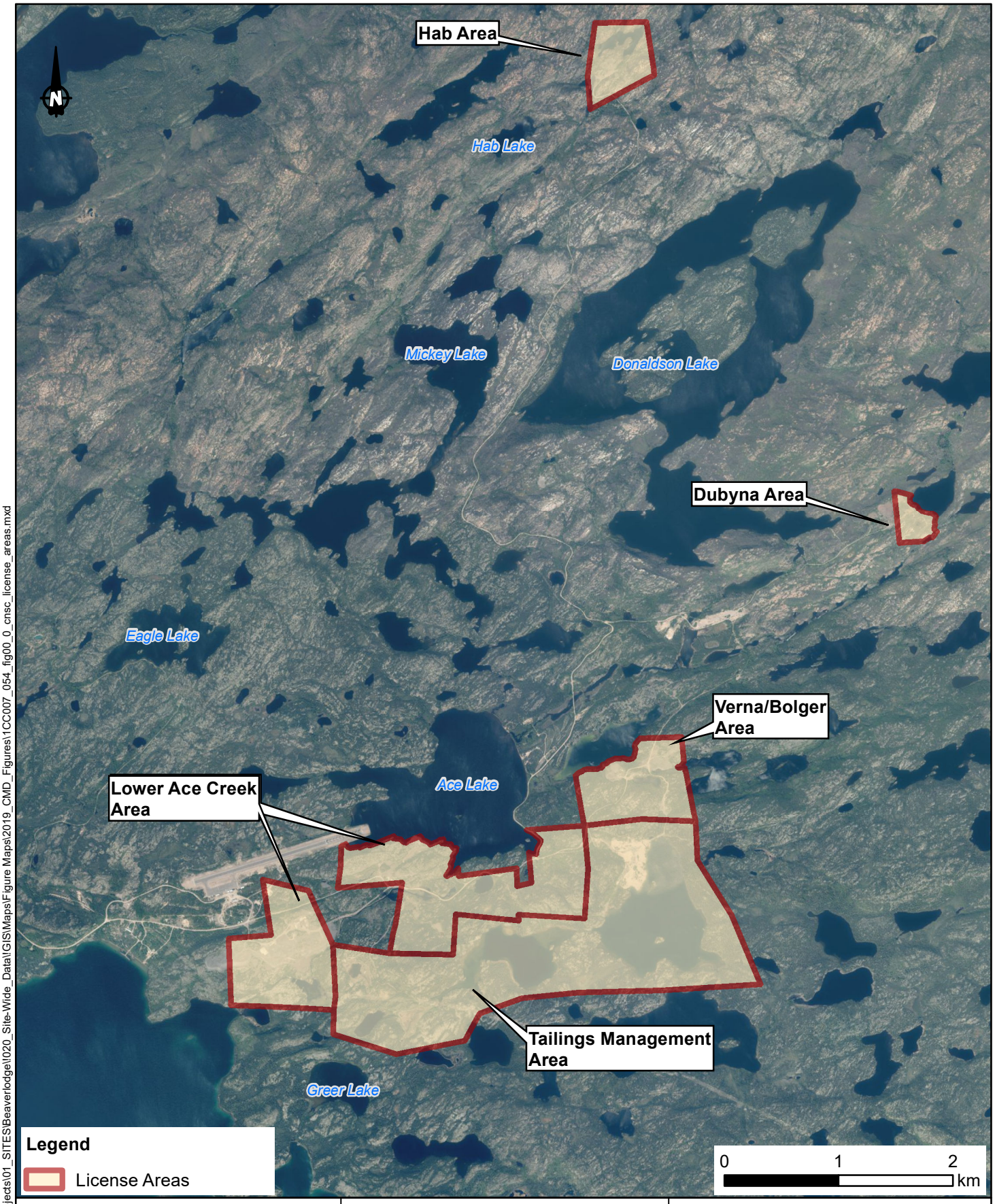
SIGNED at OTTAWA, this 19th day of December, 2019.

Rumina Velshi, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF THE DECOMMISSONED BEAVERLODGE MINE AND MILL SITE

The location of the decommissioned Beaverlodge mine and mill site is shown on Figure 1 (e-Doc 5877251).



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srk consulting

Cameco

Beaverlodge Hearing 2019

Location of the Decommissioned Beaverlodge Mine and Mill Site

Job No: 1CC007.054

Filename: 1CC007_054_fig00_0_cnsc_license_areas

CAMECO CORPORATION

Date:	Approved:	Figure:
Apr 2019		1

PROPOSED LICENCE CHANGES

Overview

In an effort to promote clarity and consistency of language, the CNSC is in the process of implementing standard licence conditions for all CNSC licences and standardized text for the uranium mines and mills licence conditions handbooks (LCHs). The update is considered to be administrative in nature and will not have a material change on the Beaverlodge Project. The proposed Beaverlodge licence and LCH have been developed in accordance with CNSC procedures and guidance.

Licence Conditions

There are no changes to the existing licence conditions.

Licence Format

The current CNSC licence was updated to the current standard licence conditions as part of the licence amendment in December 2019 and therefore, the licence revisions are limited to those required to enable the current request.

Licence Period

There are no changes to the licence period.

Appendix A

It is proposed that Figure 1 be updated to remove 18 properties proposed for release.

PROPOSED DRAFT LICENCE

The proposed draft licence is provided on the following pages of the document.

WASTE FACILITY OPERATING LICENCE
CAMECO CORPORATION
BEAVERLODGE

I) LICENCE NUMBER: WFOL-W5-2120.2/2023

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

Cameco Corporation
2121 – 11th Street West
Saskatoon, Saskatchewan S7M 1J3
Corporate Number 332981-0

III) LICENCE PERIOD: This licence is valid from June 1, 2013 to May 31, 2023, unless suspended, amended, revoked or replaced.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to possess, manage and store, the nuclear substances associated with the decommissioned Beaverlodge mine and mill site located in the province of Saskatchewan, as shown in the figure contained in Appendix A to this licence.

V) EXPLANATORY NOTES:

a) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.

b) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the *Nuclear Safety and Control Act* and its associated Regulations.

c) The WFOL-W5-2120.2/2023 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission staff to assess the licensee's compliance with the conditions listed in this licence. The LCH also provides information regarding delegation of authority and applicable version control of documents comprising compliance verification criteria.

VI) CONDITIONS:

G. GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1. MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

2. OPERATING PERFORMANCE

2.1 Operations Program

The licensee shall implement and maintain an operating program.

2.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

3. SAFETY ANALYSIS

3.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

4. PHYSICAL DESIGN

4.1 Design Program

The licensee shall implement and maintain a design program.

5. *RADIATION PROTECTION*

5.1 Radiation Protection Program

The licensee shall implement and maintain a radiation protection program.

6. *CONVENTIONAL HEALTH AND SAFETY*

6.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

7. ENVIRONMENTAL PROTECTION

7.1 Environmental Protection Program

The licensee shall implement and maintain an environmental protection program.

8. EMERGENCY MANAGEMENT

8.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

9. SAFEGUARDS AND NON-PROLIFERATION

9.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

SIGNED at OTTAWA, this _____ day of _____, 2022.

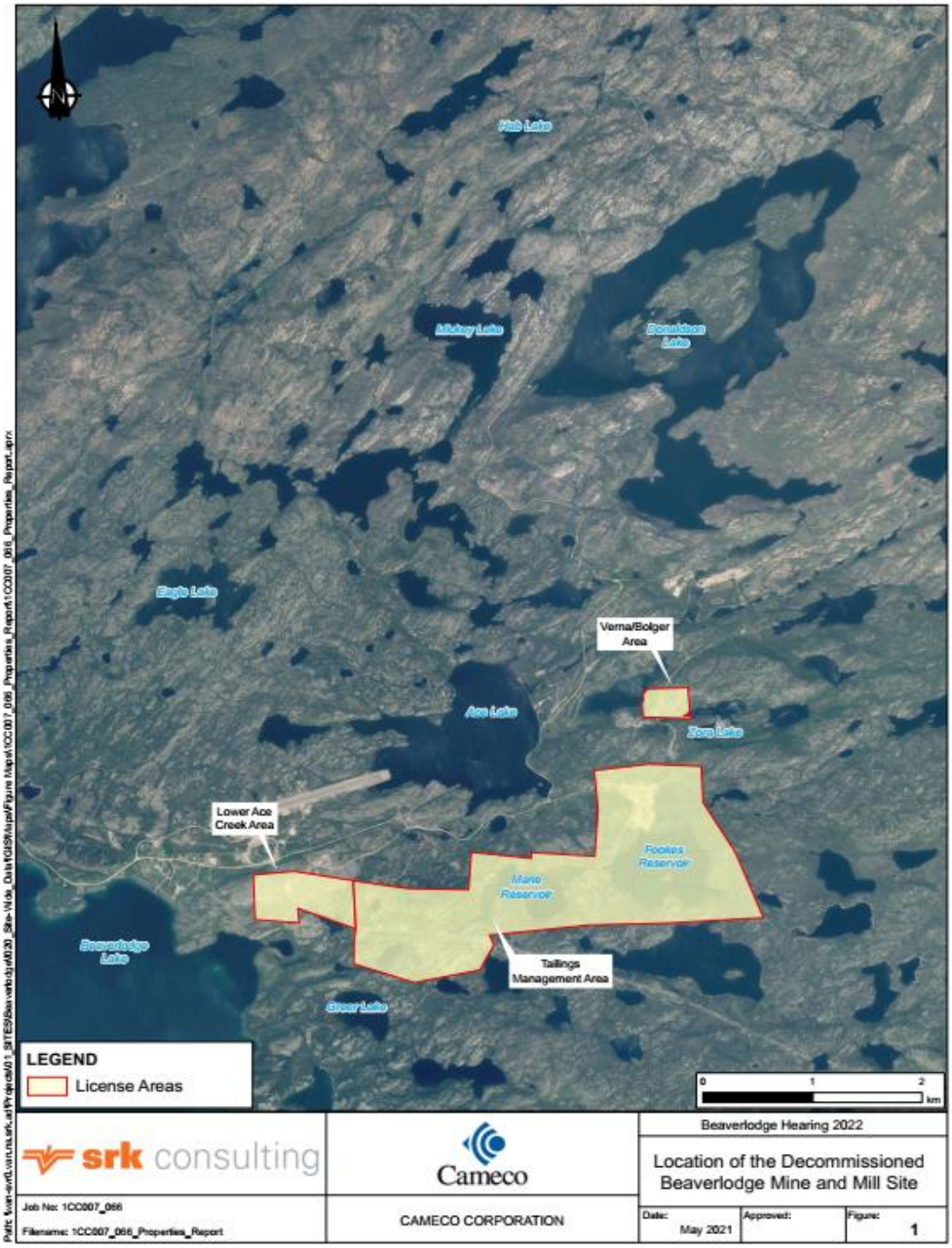
DRAFT

_____
Rumina Velshi, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF THE DECOMMISSONED BEAVERLODGE MINE AND MILL SITE

(e-Doc 6540851)



PROPOSED DRAFT LICENCE CONDITIONS HANDBOOK

The proposed draft LCH is provided on the following pages of the document.

Canada's Nuclear Regulator

e-Doc 6540892 (Word)
e-Doc 6540898 (PDF)

DRAFT LICENCE CONDITIONS HANDBOOK

LCH-WFOL-W5-2120.2/2023

BEAVERLODGE PROJECT
WASTE FACILITY OPERATING LICENCE

WFOL-W5-2120.2/2023

Revision 1

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

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Licence Conditions Handbook **Effective: May XX, 2022**

LCH-WFOL-W5-2120.2/2023, Revision 2

Beaverlodge Project

Waste Facility Operating Licence

WFOL-W5-2120.2/2023

SIGNED at OTTAWA this XX day of May, 2022

_____

Patrick Burton, Director
Uranium Mines and Mills Division
Directorate of Nuclear Cycle and Facilities Regulation
CANADIAN NUCLEAR SAFETY COMMISSION

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Revision History:

Effective Date	Revision	Section(s) changed	Description of the Changes	DCR e-DOC
January 23, 2014	0	N/A	Original Document	4053021 (Word) 4069351 (PDF)
March 12, 2020	1	All	Licence and LCH modernization which includes new standard licence conditions and updated LCH text and format.	5913955 (Word) 4069351 (PDF)
May XX, 2022	2	All	Updates to text and tables to reflect current UMMD LCH content, added program references where applicable, update to document references.	6540892 (Word) 6540898 (PDF)

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TABLE OF CONTENTS

PART I - INTRODUCTION

The purpose of the licence conditions handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition (LC). This will help ensure that the licensee will maintain facility operations in accordance with the licence and the intent of the licensing basis. The intent of the licensing basis is to maintain the protection of the health, safety and security of the public and workers, and the protection of the environment. The LCH also provides information regarding delegation of authority, document version control and conflict resolution. The LCH should be read in conjunction with the licence.

The LCH has three parts under each LC: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains the regulatory context, background, and/or history related to the LC. CVC are criteria used by Canadian Nuclear Safety Commission (CNSC) staff to oversee compliance with the LC. Guidance is non-mandatory information, including direction, on how to comply with the LC.

The statement “a person authorized by the Commission” in the LCs or the LCH indicates that the Commission may delegate certain authority to CNSC staff. Unless otherwise specified, the delegation of authority by the Commission to act as a person authorized by the Commission (Delegated Officer) is only applied to incumbents in the following positions:

- Director, Uranium Mines and Mills Division
- Director General, Directorate of Nuclear Cycle and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch

PART II – FRAMEWORK FOR EACH CONDITION

G. GENERAL

G.1 Licensing Basis for Licensed Activities

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

(i) the regulatory requirements set out in the applicable laws and regulations

(ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence

(iii) the safety and control measures described in the licence application and the documents needed to support that licence application

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble

Licence condition G.1 requires activities (defined in Section IV of the Licence) be conducted in accordance with the licensing basis. Further information on the licensing basis is available in CNSC regulatory document, REGDOC-3.5.3 *Regulatory Fundamentals*.

The licensing basis, established by the Commission at the time the licence is issued, sets the boundary conditions for a regulated activity, and establishes the basis for the CNSC's compliance program for that regulated activity.

Part (i) of licence condition G.1 includes, but is not limited to, the following:

- *Nuclear Safety and Control Act*
- *General Nuclear Safety and Control Regulations*
- *Uranium Mines and Mills Regulations*
- *Radiation Protection Regulations*
- *Nuclear Substances and Radiation Devices Regulations*
- Canada/International Atomic Energy Agency (IAEA) Safeguards Agreement

The safety and control measures mentioned under Parts (ii) and (iii) of licence condition G.1 have the potential to affect the health and safety of people, the environment, security or international obligations to which Canada agrees. These measures may be found in high-level programmatic documents but might also be found in lower-level supporting documentation. Safety and control measures can also be found in licensing basis publications such as CNSC regulatory documents, CSA Group standards or licensee documentation submitted in support of a licence.

The CNSC licence authorizes Cameco Corporation (Cameco) to conduct the following undertakings at the decommissioned Beaverlodge mine and mill site, for which the CNSC provides regulatory oversight:

- maintenance activities associated with the decommissioned facilities
- environmental monitoring
- implementation of the remedial options identified in Cameco's Beaverlodge Mine Site Path Forward Report (e-Doc 4052116).

Compliance Verification Criteria

Licensing Basis Documents

Licensing basis documents are listed in appendix B and C in addition to tables under the most relevant LC. All "shall" or normative statements in licensing basis publications are considered CVC unless stated otherwise. If any "should" or informative statements in licensing basis publications are also considered CVC, this is provided under the most relevant LC.

In the event of any inconsistency between two elements of the licensing basis, the licensee shall consult CNSC staff to determine the approach to resolve the issue.

For operational activities that are not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state that is compliant with the licensing basis, taking into account the risk significance of the situation. Reporting requirements are outlined in CNSC's REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills* and discussed under LC 2.2 of this LCH.

Changes to documentation or activities that result in operational activities not being in accordance with the licensing basis must be approved by the Commission prior to implementation.

Guidance

When the licensee becomes aware that a proposed change or activity might not be in accordance with the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them. Guidance for notifications to the CNSC related to licensee changes are discussed under LC G.2.

G.2 Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble

During the course of licensed activities, it is expected that the licensee may make changes to implement improvements or to address changes in operational needs. While making these changes, it is imperative the licensee remains within the bounds of the licensing basis.

Appendix B provides a list of licensee documents that require notification of change. CNSC staff track the current version of these licensee documents separate from the LCH, (e-Doc 6074070).

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Changes to the design, operating conditions, policies, programs and methods that have the potential to be outside of the licensing basis require prior written notification to the CNSC. CNSC staff will confirm the change remains within the licensing basis and notify the licensee prior to implementation of the change by the licensee. The licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. Regular communication between the CNSC and the licensee should ensure review timelines are established prior to submission of written notification. It remains the responsibility of the licensee to ensure that the decommissioned Beaverlodge Project continues to operate within the bounds of the licensing basis.

Prior written notification shall include:

- a summary description of the change
- the rationale for the change
- expected duration (if not a permanent change)
- a summary explanation from the licensee supporting the conclusion that the change remains in accordance with the licensing basis

Ongoing regular communication shall be maintained between the CNSC and licensee.

Guidance

A list of criteria to determine if a change would be in accordance with the licensing basis is provided in appendix A of CNSC process document *Overview of: Assessing licensee changes to documents or operations* (e-Doc 4055483).

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble

The licensee is responsible for providing an appropriate financial guarantee that is acceptable to the Commission.

All costs associated with the management of the decommissioned Beaverlodge mine and mill site are paid by Canada Eldor Inc., a wholly-owned subsidiary of Canada Development Investment Corporation. Both Canada Eldor Inc. and Canada Development Investment Corporation report to the Federal Minister of Finance. The Department of Finance has confirmed via letter to the CNSC that:

> "Canada Eldor Inc. is an agent of the Crown in right of Canada for all purposes. It follows that any undischarged obligations and liabilities of Canada Eldor Inc. are the obligations and liabilities of the Crown in right of Canada. That will include Canada Eldor Inc.'s obligations and liabilities to decommission the Beaverlodge Site and the expenses associated with possession, management and control of nuclear substances at that site".

Compliance Verification Criteria

The financial guarantee for the decommissioned Beaverlodge mine and mill site is provided by the Government of Canada through Canada Eldor Inc. and has no specified value. Therefore changes and updates to the financial guarantee are not required.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Financial Assurance for Cameco Corporation, Beaverlodge Decommissioned Mine and Mill Site, Northern Saskatchewan	1260110	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Financial Guarantees for the Decommissioning of Licensed Activities	G-206
CNSC	Decommissioning Planning for Licensed Activities	G-219

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

Preamble

The public information and disclosure program ensures that information related to the health and safety of persons and the environment and other issues associated with the lifecycle of the nuclear facility is effectively communicated to the public. In addition, the program shall include a commitment to and protocol for ongoing timely communications regarding emissions, effluent releases, unplanned events and other incidents and activities related to the licensed facility that may be of interest to the public.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Public Information and Disclosure*	REGDOC-3.2.1

* Cameco to post summaries of Environmental Risk Assessments on their website, rather than the entire document, in accordance with Cameco's June 4, 2020 letter to the CNSC (L. Mooney to H. Tadros, e-Doc 6318384) and Cameco's June 12, 2020 email (K. Nagy to R. Snider, e-Doc 6316951).

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Public Information Program	6660192	Yes

Guidance

There is no guidance provided for this licence condition.

1 MANAGEMENT SYSTEM

Licence Condition 1.1

The licensee shall implement and maintain a management system.

Preamble

The "management system" safety and control area covers the framework which establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives and fosters a healthy safety culture.

The management system must satisfy the requirements set out in the *Nuclear Safety and Control Act* (NSCA), regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in implementation of the management system. An adequately established and implemented management system provides the evidence that the licensing basis remains valid.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Quality Management Program	4091997	Yes

Guidance

There is no guidance for this licence condition.

2 OPERATING PERFORMANCE

Licence Condition 2.1

The licensee shall implement and maintain an operating program.

Preamble

The "operating performance" safety and control area includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Cameco Beaverlodge Mine Site Path Forward Report	4052116	Yes
Cameco	Quality Management Program	4091997	Yes
Cameco	Environmental Monitoring Program	6562595	Yes

Operating performance will be evaluated against the following principles:

2.1.1 The process for constructing structures, systems and components follows accepted construction and project management practices.

2.1.2 Construction activities are carried out in accordance with the design requirements including drawings and specifications and related work instructions.

2.1.3 Procedures and work instructions are documented, reviewed and approved.

2.1.4 Operational activities are controlled through the use of and adherence to operational documents.

The planning, control and verification of work will be evaluated against the following principles:

2.1.5 Work activities are planned to ensure that they can be carried out safely and effectively. Hazards are assessed and controls are identified.

2.1.6 Job hazard assessments are completed prior to conducting non-routine or complex work activities to identify and mitigate potential hazards to worker health and safety, and to the environment to an acceptable level or as low as reasonably achievable (ALARA), social and economic factors being taken into account.

2.1.7 Measures are established and documented to assure that non-routine work is carried out under controlled conditions.

2.1.8 Work activities are identified, defined in approved plans, procedures, instructions, and/or drawings to provide an appropriate level of reference.

2.1.9 Work is assigned to qualified personnel.

2.1.10 Work is carried out according to specified requirements. Controls are implemented to assure that work is carried out under controlled conditions. Preventative and protective measures are implemented to address identified hazards and risks.

2.1.11 The implementation of routine and non-routine work activities is monitored.

2.1.12 Management verifies that work is carried out according to specified requirements.

2.1.13 The management of problems will be evaluated against the following:

- a process exists to formally identify problems
- problems are identified and immediately controlled, if required
- the significance of problems is evaluated and the underlying causes determined
- identified problems are accepted, mitigated or resolved
- implementation of actions employed to resolve problems are reviewed for effectiveness.

Guidance

There is no guidance provided for this licence condition.

Licence Condition 2.2

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble

This LC requires the licensee to implement and maintain a process for reporting information to the CNSC. This includes monitoring results, changes to facilities or approved activities, performance assessments and the occurrence of unusual events. Sections 29 and 30 of the *General Nuclear Safety and Control Regulations*, section 38 of the *Nuclear Substances and Radiation Devices Regulations* and section 16 of the *Radiation Protection Regulations* provides further insight into reportable events.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2

The licensee shall submit to the CNSC an annual compliance report by April 15 of each year, covering the operation for the 12-month period from January 1 to December 31 of the previous year.

Guidance

There is no guidance provided for this licence condition.

3 SAFETY ANALYSIS

Licence Condition 3.1

The licensee shall implement and maintain a safety analysis program.

Preamble

The "safety analysis" safety and control area includes the systematic evaluation of the potential hazards associated with the proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Environmental Monitoring Program	6562595	Yes
Cameco	Quantitative Site Model	3956318	Yes
Cameco	Model Update and Environmental Risk Assessment	6379444	Yes

The safety analysis program will be evaluated against the following principles:

3.1.1 A process has been implemented and maintained to identify, assess, and eliminate or control health and safety and environmental risks associated with existing and new processes or changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

3.1.2 Risks to health, safety and the environment have been identified, assessed, eliminated or controlled for existing and new processes or for changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

3.1.3 Appropriate methodologies are used to identify potential hazards and consider the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

3.1.4 Modelling is regularly updated using measured values to replace important assumptions and to increase the certainty of predicted long-term behaviour of contaminants.

Job hazard assessments conducted when planning non-routine and complex work activities are discussed under operating performance.

Guidance

There is no guidance provided for this licence condition.

4 PHYSICAL DESIGN

Licence Condition 4.1

The licensee shall implement and maintain a design program.

Preamble

The "physical design" safety and control area relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

The design basis is the range of conditions and events taken into account in the design of structures, systems and components of a facility according to established criteria, such that the facility can withstand them without exceeding authorized limits for the planned operation of safety systems.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Quality Management Program	4091997	Yes
Cameco	Property Description Manual	4459861	Yes

Guidance

There is no guidance provided for this licence condition.

5 RADIATION PROTECTION

Licence Condition 5.1

The licensee shall implement and maintain a radiation protection program.

Preamble

The "radiation protection" safety and control area covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses received are monitored, controlled, kept as low as reasonably achievable (ALARA), with social and economic factors are being taken into account.

There are no full time workers at the site and most maintenance and monitoring work is completed by contractors. Estimated radiation doses to workers are well below the regulatory public dose limit of 1 mSv/year; therefore, Cameco is not required to ascertain individual worker dose by means of direct measurement. Workers are not required to wear licensed dosimetry to measure and monitor dose.

The overall radiation risks for workers and the public accessing the decommissioned Beaverlodge mine and mill site are low because of the low levels of radiation. The radiological risks for non-routine work activities will be assessed by completing a Job Hazard Analysis and if required, radiation protection measures will be implemented in accordance with the Beaverlodge Facility Licensing Manual.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes

The radiation protection (RP) program will be assessed against the following principles:

5.1.1 The organization and administration of RP provides effective implementation and control of RP activities. The roles, responsibilities and qualification requirements of all persons involved in the RP program are clearly defined. All levels of management and workers are committed to RP requirements and practices within their level of responsibility. A performance review process is established to evaluate the RP program.

5.1.2 RP personnel and RP supervisors have the qualifications (knowledge, skills, experience) needed to effectively implement and conduct the RP program.

5.1.3 Radiological conditions are monitored and sources of internal and external radiation exposures are controlled. Access and work in radiological areas are controlled so that collective and individual radiation exposures are kept in accordance with the ALARA principle.

5.1.4 RP instrumentation and equipment are calibrated, maintained and used so that radiation levels are accurately determined. Uncalibrated equipment is removed from use.

5.1.5 Appropriate contamination control measures are implemented to control and minimize the contamination of areas, equipment and personnel.

5.1.6 Effective decontamination control measures are implemented to control and prevent the contamination of areas, equipment and personnel.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"	G-129

6 CONVENTIONAL HEALTH AND SAFETY

Licence Condition 6.1

The licensee shall implement and maintain a conventional health and safety program.

Preamble

The "conventional health and safety" safety and control area covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.

The regulation of non-radiological health and safety at uranium mines and mills is governed by the *Canada Labour Code Part II*, which is administered by Employment and Social Development Canada (ESDC). However, the *Saskatchewan Uranium Mines and Mills Exclusion Regulations* (SOR/2001-115) defer the regulation of occupational health and safety in Saskatchewan uranium mines and mills to the province of Saskatchewan in accordance with the requirements of *The Mines Regulations, 2018* Part II Revised Regulations of Saskatchewan.

The CNSC also has regulatory responsibilities for the oversight of the protection of the health and safety of workers. The CNSC harmonizes the oversight of conventional health and safety with the Saskatchewan Ministry of Labour Relations and Workplace Safety.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes

The conventional health and safety program will be assessed against the following principles:

6.1.1 Housekeeping standards have been identified and are enforced to ensure that work areas are kept clean and organized.

6.1.2 Facilities, processes and procedures have been implemented to ensure the safe management of hazardous materials.

6.1.3 Employees and contractors actively participate in the management of conventional health and safety.

6.1.4 Management verifies that employees and contractors actively participate in the management of health and safety in their workplace.

6.1.5 A process has been established and maintained to monitor, measure and record conventional health and safety performance and the effectiveness of the occupational health and safety program on a regular basis.

6.1.6 Routine inspections are performed by workers, supervisors, senior staff and/or safety professionals to identify any potential safety issues.

6.1.7 Processes and procedures are established and maintained to investigate accidents and incidents, to identify root causes, to implement corrective actions and to verify that corrective actions have been completed and will effectively prevent recurrence.

6.1.8 Procedures have been implemented and maintained for reporting work-related injuries, illnesses, fatalities and conventional health and safety incidents including near misses.

6.1.9 The causes of injuries are investigated, corrective actions implemented, and the effectiveness of corrective actions verified.

6.1.10 A preventative and corrective action procedure has been established and maintained to address non-conformances and inadequately controlled risks.

Guidance

There is no guidance provided for this licence condition.

7 ENVIRONMENTAL PROTECTION

Licence Condition 7.1

The licensee shall implement and maintain an environmental protection program.

Preamble

The "environmental protection" safety and control area covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures	REGDOC-2.9.1
CSA Group	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.4-10
CSA Group	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	N288.6-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Cameco Beaverlodge Mine Site Path Forward Report	4052116	Yes
Cameco	Quantitative Site Model	3956318	Yes
Cameco	Environmental Monitoring Program	6562595	Yes
Cameco	Model Update and Environmental Risk Assessment	6379444	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015

8 EMERGENCY MANAGEMENT

Licence Condition 8.1

The licensee shall implement and maintain an emergency preparedness program.

Preamble

The "emergency management and fire protection" safety and control area covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. It also includes any results of exercise participation.

Licensees are required to continually maintain and enhance their emergency management programs.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Nuclear Emergency Preparedness and Response, Volume 2*	REGDOC-2.10.1

* Off-site reporting timelines accepted by CNSC staff for Saskatchewan uranium mine and mill sites are described in January 30, 2020 letter from Cameco to the CNSC (L. Mooney to H. Tadros, e-Doc 6109667).

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes

Guidance

There is no guidance provided for this licence condition.

9 SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 9.1

The licensee shall implement and maintain a safeguards program.

Preamble

The "safeguards and non-proliferation" safety and control area covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Safeguards and Nuclear Material Accountancy*	REGDOC-2.13.1

* Sections of REGDOC applicable to Beaverlodge listed in July 24, 2018 letter from Cameco to the CNSC (L. Mooney to H. Tadros, e-Doc 5614635).

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licencing Manual	3942669	Yes

Guidance

There is no guidance provided for this licence condition.

APPENDIX A CHANGE CONTROL PROCESS

A.1 Change Control Process

A change control process is applied to the LCH to ensure that:

- preparation and use of the LCH are properly controlled
- all referenced documents are correctly identified and maintained
- procedures for modifying the LCH are followed.

A request to change this LCH can be initiated by either CNSC staff or the licensee. The licensee will be consulted on any changes to the LCH that are proposed by CNSC staff.

CNSC staff will take the following steps to update the LCH:

1. the CNSC receives or initiates written notification of proposed change
2. initiate a change request using the Change Request Form
3. complete a technical review of the proposed change, if required
4. consult the licensee and in case of disagreement on the proposed change, the dispute resolution process outlined in section A.3 will apply
5. obtain consent and signature from a Delegated Officer
6. update the LCH in accordance with the Change Request Form and send the updated document to the parties identified on the distribution list (section A.5).

Change Request Form

1. GENERAL INFORMATION			
File Plan #		**e-Doc #(s) for Change Request Form**	
Licensee	**Licence Number**	**LCH #, Rev/Version**	**Request Date**
Licensing Officer			

2. CHANGE(S) TO THE LCH			
#	**Description and Purpose**	**Proposed Change**	**References**
1	<initiator, nature, reason for change, e.g. administrative, change to a licensee doc, etc.>	<identify modifications, such as by track changes, highlighting, etc.>	<LC, page, section #, etc.>
2			

3. ASSESSMENT (text and/or e-Doc #s)			
#	**Division/Org**	**Comment**	**Disposition**
1	<division>		
	<division>		
	<licensee>		
	<division>		
2	etc.		

4. CONSENT TO MODIFY		
#	**Agreed**	**Comment**
1		
2		

Name	**Title**	**Signature**	**Date**

5. LCH DOCUMENTATION AND DISTRIBUTION			
New LCH Number	**LCH Effective Date**	**e-Doc #** (include version number)	
CNSC Outgoing Notification		**e-Doc #**	**Date Sent**

APPENDIX A

A.2 Review Criteria for Proposed Changes to Licensing Basis Documents

The licensee must provide the CNSC with written notification of a proposed significant change to key licensee documents before the licensee implements the change. The notification must be accompanied by sufficient information to demonstrate that the change is within the intent of the licensing basis. Written notification of minor or administrative changes may be made in batches after the changes have been implemented.

The following criteria will be used by CNSC staff to determine if the proposed change is acceptable:

1. The submission includes the appropriate level and quality of information with regards to:
   a) The description of the proposed change including:
      - a summary of the change, including the purpose or need for the change
      - a preliminary finding of whether this proposal or notification is required under the NSCA, a regulation made under the Act or the licence, or has implications under the *Impact Assessment Act*, or whether a licence amendment or other licensing action would likely be required
      - where applicable, the alternatives evaluated and the reasons for selection of the chosen option
      - any changes to the inventories of nuclear substances on site related to the proposed change
      - the construction, commissioning and operating schedule for the proposed change including hold points or progress reports for regulatory review and approval (as appropriate)
      - expected impacts, if any, on the proposed decommissioning or closure plans
      - results of any risk analysis or hazard operability studies performed, and a summary of the identified hazards and the mitigation measures identified to control potential hazards
   b) The description of the design control, operating specifications and criteria including:
      - the design basis and criteria, and performance specifications
      - the design drawings such as the general arrangement, process and instrumentation diagrams, and process flow sheets
      - the quality management program for the various key stages of the change (e.g., design, construction, commissioning, etc.)

c) The assessment of both the short and long term impacts with the mitigation measures in place on:

- worker's health and safety, including potential radiological and non-radiological exposures
- the environment
- security
- Canada's international obligations

d) The planned administrative controls including:

- changes to the organization, roles and responsibilities
- changes to applicable programs and procedures
- a description of the proposed monitoring, inspection and test plans, including locations and frequency proposed to evaluate both positive and negative results

e) Changes to contingency plans including "full-stop measures"

f) Evidence that the licensee's internal reviews and approvals have been completed, including meeting the requirements of the licensee's change management procedure and consultation with the onsite occupational health and environmental committees, where applicable

g) Identification of the documents and training programs that may require revision when the proposed change is implemented

2. The effects of the proposed change or action remain within the licensing basis.
3. Following the implementation of the change the licensee will remain in compliance with the requirements set out in the applicable acts, regulations, and LCs.

A.3 Dispute Resolution

In case of a dispute between the licensee and CNSC staff regarding changes to the LCH, both parties will meet to discuss the dispute and reach a decision on the path forward. The decision, including its rationale will be documented. If any party is not satisfied with the decision, the resolution process will proceed up to the Director, Director General or Executive Vice-President and Chief Regulatory Operations Officer level. If any party is still not satisfied with the decision, the issue will be brought to the attention of the Commission at a Commission meeting. The decision made by the Commission will be final.

A.4 Records Management

In order to track changes to the LCH, the document change request and accompanying documentation will be archived in records and referenced in the revision history of the LCH. Electronic communication related to the change, such as comments from reviewers will be stored in the CNSC information management system.

APPENDIX A

A.5 Distribution

A copy of the updated version of the LCH will be distributed to the following parties:

- Uranium Mines and Mills Division, CNSC
- Cameco Corporation

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH in their report to the Commission.

APPENDIX A

APPENDIX B LICENSEE DOCUMENTS THAT REQUIRE NOTIFICATION OF CHANGE

Document Title	e-DOC
Facility Licensing Manual	3942669
Quality Management Program	4091997
Environmental Monitoring Program	6562595
Property Description Manual	4459861
Public Information Program	6660192
Quantitative Site Model	3956318
Cameco Beaverlodge Mine Site Path Forward Report	4052116
Model Update and Environmental Risk Assessment	6379444
Financial Assurance for Cameco Corporation, Beaverlodge Decommissioned Mine and Mill Site, Northern Saskatchewan	1260110

APPENDIX C LIST OF DOCUMENTS USED AS GUIDANCE OR COMPLIANCE VERIFICATION CRITERIA

Document	Document Title	Document Number
CNSC	Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"	G-129
CNSC	Financial Guarantees for the Decommissioning of Licensed Activities	G-206
CNSC	Decommissioning Planning for Licensed Activities	G-219
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures	REGDOC-2.9.1
CNSC	Nuclear Emergency Preparedness and Response, Version 2	REGDOC-2.10.1
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2
CNSC	Public Information and Disclosure	REGDOC-3.2.1
CNSC	Regulatory Fundamentals	REGDOC-3.5.3
CSA Group	Management System Requirements for Nuclear Facilities	N286-12
CSA Group	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.4-10
CSA Group	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	N288.6-12
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015

Note: For CNSC documents, the most recent version of a referenced document shall be implemented following review and agreement between Cameco and the Canadian Nuclear Safety Commission.