



UNPROTECTED/NON PROTÉGÉ

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CMD: 19-H6

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A Licence Amendment

Cameco Corporation

**Request for Release of 20
Beaverlodge Properties
from Requiring Licensing
under the *Nuclear Safety
and Control Act***

Cameco Corporation

**Demande de libération
de 20 propriétés de
Beaverlodge de
l'obligation d'être
autorisées en vertu de la
*Loi sur la sûreté et la
réglementation
nucléaires***

Commission Public Hearing

Audience publique de la Commission

Scheduled for:
2 October 2019

Prévue pour :
2 octobre 2019

Submitted by:
CNSC Staff

Soumise par :
Personnel de la CCSN

Summary

This Commission Member Document (CMD) pertains to a request from Cameco Corporation for a decision regarding:

- removal of properties from the Beaverlodge Waste Facility Operating Licence WFOL-W5-2120.0/2023, to facilitate the transfer of properties to Saskatchewan's Institutional Control Program (ICP).

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.0/2023 to remove 20 properties from the figure within Appendix A;
- exempt the government of Saskatchewan from licensing under the NSCA for the 19 properties, or portions therein, proposed for transfer into Saskatchewan's Institutional Control Program; and
- accept amended Waste Facility Operating Licence WFOL-W5-2120.1/2023, which has been updated to the current CNSC standard licence format.

The following items are attached:

- current licence WFOL-W5-2120.0/2023;
- proposed amended licence WFOL-W5-2120.1/2023; and
- draft Licence Conditions Handbook.

Résumé

Le présent document à l'intention des commissaires (CMD) porte sur une demande de Cameco Corporation nécessitant une décision à l'égard de :

- suppression de propriétés du permis d'exploitation d'une installation de gestion des déchets, WFOL-W5-2120.0/2023, que détient Beaverlodge pour faciliter le transfert des propriétés au Programme de contrôle institutionnel (PCI) de la Saskatchewan.

Le personnel de la CCSN recommande que la Commission :

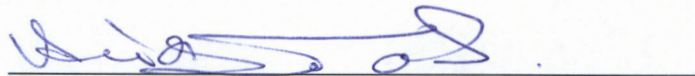
- modifie le permis d'exploitation d'une installation de gestion des déchets, WFOL-W5-2120.0/2023, afin d'enlever 20 propriétés se trouvant sur la figure de l'annexe A;
- exempte le gouvernement de la Saskatchewan de la nécessité de détenir un permis en vertu de la LSRN pour les 19 propriétés, en totalité ou en partie, que l'on propose de transférer au Programme de contrôle institutionnel de la Saskatchewan;
- accepte le permis d'exploitation d'une installation de gestion des déchets modifié, WFOL-W5-2120.1/2023, qui a été mis à jour afin de refléter le format des permis normalisés de la CCSN.

Les pièces suivantes sont jointes :

- permis actuel WFOL-W5-2120.0/2023;
- permis modifié proposé WFOL-W5-2120.1/2023;
- ébauche du Manuel des conditions de permis.

Signed/signé le

24 July 2019



Haidy Tadros

Director General / Directeur General

Directorate of Nuclear Cycle and Facilities Regulation

Directrice générale de la

Direction de la réglementation du cycle et des installations nucléaires

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EXECUTIVE SUMMARY

The decommissioned Beaverlodge mine and mill site is located in northwestern Saskatchewan, approximately 8 kilometres from Uranium City. The site operated from 1952 to 1982 and decommissioning was completed in 1985. Comprising of 65 separate properties, the site has been in a state of post decommissioning monitoring since decommissioning was completed.

In 2009, the Commission granted an exemption from licensing with respect to five of the Beaverlodge properties which in turn were transferred to the government of Saskatchewan's Institutional Control Program (ICP). On October 3, 2018 Canadian Nuclear Safety Commission (CNSC) staff provided the Commission with a technical briefing outlining the ICP.

This Commission Member Document (CMD) presents CNSC staff's assessment and recommendations regarding Cameco Corporation's (Cameco) request for a licence amendment to remove 20 properties from its Waste Facility Operating Licence WFOL-W5-2120.0/2023.

Cameco has requested that 19 of the 20 properties, or portions therein, be transferred to the ICP. If these properties enter the program, the government of Saskatchewan will manage any monitoring and maintenance and respond to any unforeseen events. One property meets clearance levels and therefore does not require any long term monitoring, institutional control, or regulatory oversight under the *Nuclear Safety and Control Act* (NSCA). This property, if released from Cameco's licence, will remain under provincial control, as with other crown lands in northern Saskatchewan, but will not be placed into the ICP. CNSC staff can confirm that this property poses no risk to the environment or public as a result of its past usage.

Saskatchewan's provincial regulations establishing the ICP require that the government of Saskatchewan be exempt from licensing under the NSCA in relation to any properties entering the program. If the Commission accepts Cameco's application to remove the 19 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.

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 now and will remain so in the long term under the ICP.

Upon approval of the licence amendment, 45 properties will remain under Cameco's current licence. It is Cameco's intent to have all of the remaining 45 properties transferred to the ICP by the current CNSC licence expiry in 2023.

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.0/2023 to remove 20 properties from the figure within Appendix A;
- exempt the government of Saskatchewan from licensing under the NSCA for the 19 properties, or portions therein, proposed for transfer into Saskatchewan's Institutional Control Program; and
- accept amended Waste Facility Operating Licence WFOL-W5-2120.1/2023, which has been updated to the current CNSC standard licence format.

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

1 OVERVIEW

1.1 Background

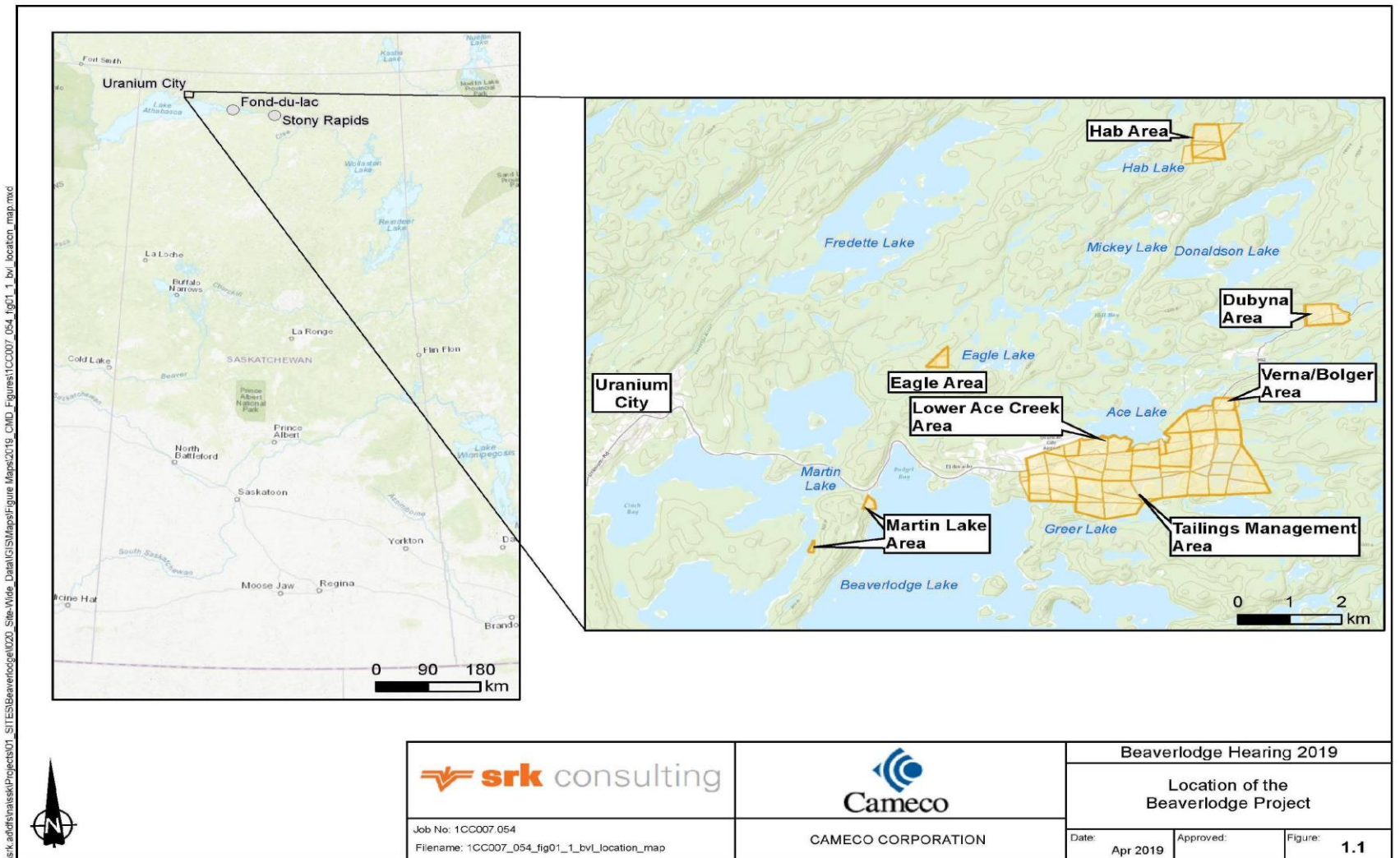
The decommissioned Beaverlodge mine and mill site is located in northwestern Saskatchewan, approximately 8 kilometres from Uranium City as shown in figure 1.1. The Beaverlodge licensed areas are outlined with an orange line. Historical mining activities in these areas were conducted primarily within two 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 approved by the Joint Regulatory Group (JRG). The JRG comprises of 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 the 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 complete a detailed assessment from 2009 through to 2013 of potential options that could advance the environmental recovery and remediation efforts in Beaverlodge area waterbodies.

Figure 1.1: Beaverlodge Project - location map



To create a remediation plan, Cameco developed a Quantitative Site Model (QSM) 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 contains 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 an update to the Commission in 2014, CNSC staff committed to providing additional information on the following items:

- defined performance objectives and actual performance indicators for each property; and
- 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 has outlined a plan for transferring 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.

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 [4]. 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 pertinent to the current request.

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; and
- 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) [5]. 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.

Operation of the ICP, including monitoring and maintenance, is by the Saskatchewan Ministry of Energy and Resources (SMER). 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 well as financial guarantees for 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 two IC 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; and
- 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 two IC 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 size.

Payment of both the ICMMF and ICUEF are made by the site holder who requested the transfer into the ICP. The two 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 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; and
- 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 releases of properties from licensing and the granting of exemptions will be in accordance with 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 therein, from federal regulatory oversight (licensing) may occur through different mechanisms depending on the 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;
- 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* [6];
- 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; and
- remediated areas where radioactive materials in excess of exemption quantities/clearance levels are present which require institutional control.

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. It can therefore 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 therein, are to be released from licensing and exemption 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 that must be 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 Indicates 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 therein, 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.

Long Term Monitoring and Management

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

1.3 Current Request

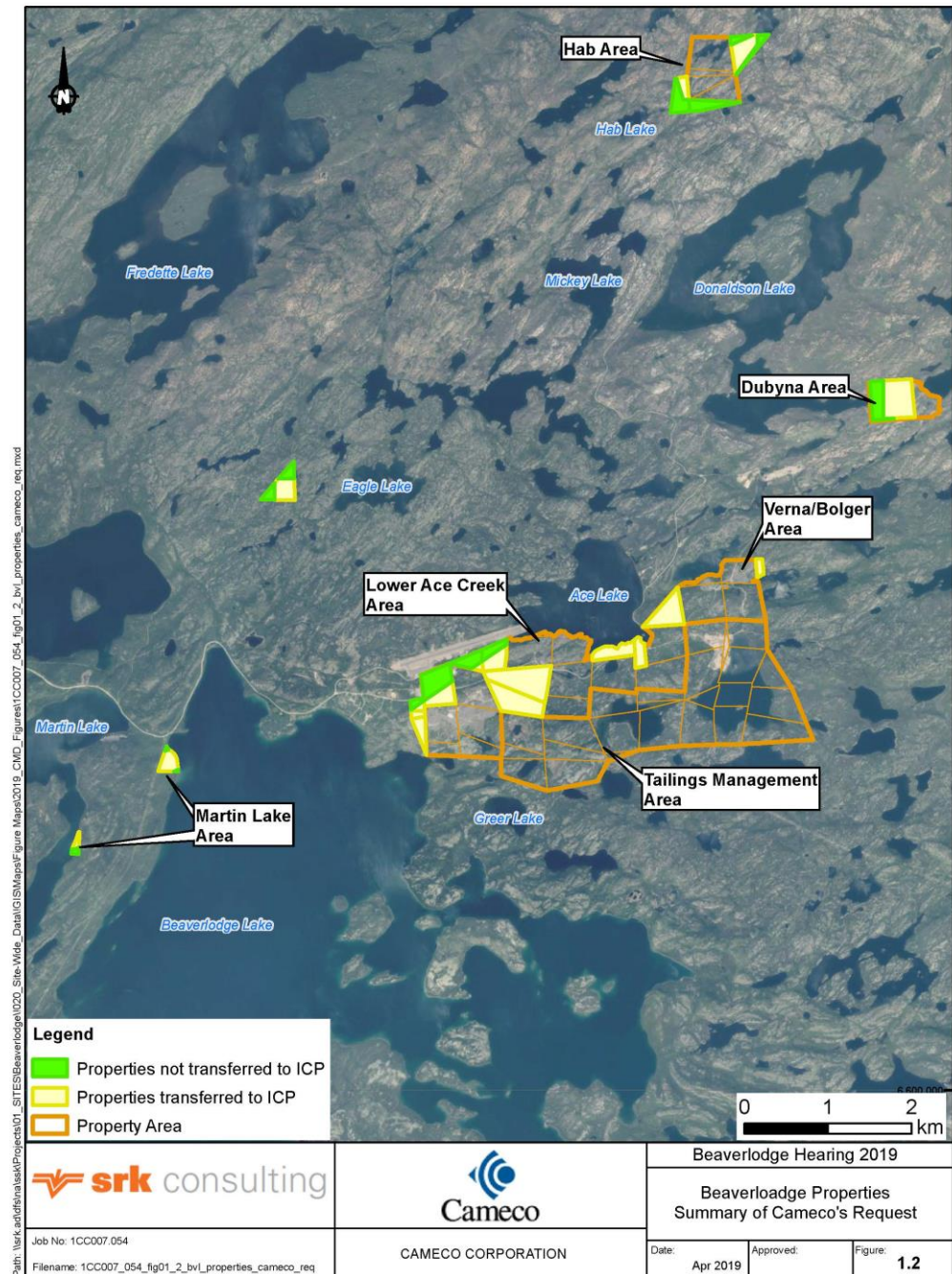
Cameco has submitted closure reports requesting the release of properties at the Beaverlodge site from CNSC licensing. Cameco's closure reports have also been submitted in support of the proposed release of 20 Beaverlodge properties from CNSC licensing and subsequently transfer 19 of the properties to the ICP.

The closure report for 14 properties was submitted in April 2016 [7] and two addendums were prepared in response to regulatory agency review comments [8,9]. In preparation for the closure report submission, Cameco and representatives from SMOE and SMER met to determine which portions of each property would require institutional control and which would not require institutional control because they were not disturbed by mining, or pose no risk. CNSC staff have no concerns with the proposed institutional control boundaries for the Beaverlodge site. One property will not require institutional control measures as there is no risk associated with the property. The adequacy of the 2016 closure report, including addendums, has been confirmed by CNSC staff and the government of Saskatchewan.

The 2016 request for release/exemption of properties did not advance to the Commission as it was decided to combine that request with another submission for the Commission's consideration. One of the considerations for the delay was to ensure CNSC staff had the opportunity to present information on the government of Saskatchewan's ICP to the Commission in advance of any request for releasing properties from licensing and exempting the government of Saskatchewan.

In April 2018, Cameco submitted a closure report for an additional six Beaverlodge properties [10]. Regulatory comments on the original submission from both SMOE and CNSC staff were addressed. Cameco subsequently submitted the application to the Commission on February 19, 2019 in order to amend the existing Beaverlodge licence to release the 20 properties from the licensing (figure 1.2) [11].

Figure 1.2: Beaverlodge Project – areas requested for release



1.4 Highlights

Cameco submitted an application for an amendment to its licence to release 20 Beaverlodge properties from CNSC licensing and subsequently transfer 19 of the properties, or portions therein, to the ICP. In support of the application, closure reports were submitted in 2016 and 2018 with information on each property and a comparison of each property to the establish performance indicators for Beaverlodge.

CNSC staff have completed their technical review and evaluation of Cameco's request and concur with the request to release the properties from the CNSC licence. All 20 properties meet the applicable performance indicators and regulatory acceptance criteria.

According to section 3(f) of *The Reclaimed Industrial Sites Regulations* [12], an exemption is required for the province before properties can be transferred into the ICP. In order to allow the 19 properties, or portions therein to enter into the ICP, CNSC staff request that the government of Saskatchewan be given an exemption under section 7 of the NSCA.

The exemption would apply to all properties proposed for transfer to the ICP, in accordance with section 3(f) of *The Reclaimed Industrial Sites Regulations*. Of the 20 properties under consideration, there is one property (EXC 2) that was not used for either waste rock or tailings storage and does not have nuclear substance in excess of exemption quantities, conditional clearance levels or unconditional clearance levels. Therefore, in accordance with subsection 5.1(1) of the *Nuclear Substances and Radiation Devices Regulations* (NSRDR), property EXC 2 does not require a licence. In addition, this property poses no unreasonable risk to the public or the environment as a result of prior licensed activities, nor does it require any institutional control measures. An exemption for the government of Saskatchewan is not required for this property.

Two of the properties proposed for release (ATO 26 and EXC ACE 3) were either not disturbed by mining/milling activities or disturbed but reclaimed and pose no health, safety or environmental risk nor are there any nuclear substances in excess or exemption of clearance levels. In accordance with subsection 5.1(1) of the NSRDR, these two properties would not normally require an exemption decision by the Commission. However, in order to meet the requirements of section 3(f) of *The Reclaimed Industrial Sites Regulations*, for an exemption from licensing requirements under the NSCA, CNSC staff are requesting that the government of Saskatchewan be exempted for these as they both are proposed for transfer, in whole or in part, into the ICP. These properties are proposed to be transferred to the ICP because they are within the boundary for areas requiring institutional control established by SMER in 2016 and not due to risk associated with these properties.

Two letters of intent have been issued by SMOE: one dated February 9, 2017 [13] (with clarification provided on January 29, 2019 [14]) on which properties would enter ICP and one dated April 5, 2019 [15] 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* [16]. SMER confirmed that the properties proposed for transfer to the ICP are all eligible subject to the Commission releasing these properties, or portions therein from licensing [17]. 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 20 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 agree that the applicable indicators and criteria have been achieved for these 20 properties.

CNSC staff have completed their technical review 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 is required for the province before properties can be transferred into the ICP.

CNSC staff recommend that the Commission:

- approve the amended Beaverlodge licence with the 20 properties removed; and
- exempt the government of Saskatchewan section 7 of the NSCA, in order to allow 19 properties to enter into the ICP.

Table 1.1 lists the 20 properties and clearly denotes that all properties meet the 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.

In order to transfer properties to the ICP, the government of Saskatchewan needs an exemption from licensing. Authority to exempt comes from section 7 of the NSCA. The conditions under which the Commission makes an exemption are pursuant to section 11 of the *General Nuclear Safety and Control Regulations* [18] which states:

“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.”

CNSC staff have verified that the 19 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.

Table 1.1: Properties under request for release from CNSC licensing

Area	Property	Meets Criteria*	Release from Licensing		Transfer to ICP
			Release & Exempt Province from Licensing	Release without Exemption	
HAB¹	HAB 3	√	√		√ (portion)
	HAB 6	√	√		√ (portion)
	EXC 2	√		√	No
	HAB 2A	√	√		√
Dubyna²	JO-NES	√	√		√ (portion)
Verna/Bolger³	Bolger 2	√	√		√
	ACE 5	√	√		√
Eagle⁴	Eagle 1	√	√		√ (portion)
Martin Lake⁵	RA 6	√	√		√ (portion)
	RA 9	√	√		√ (portion)
Lower Ace Creek³	ATO 26	√	√		√ (portion)
	EXC ATO 26	√	√		√
	URA MC	√	√		√
	EXC ACE 1	√	√		√ (portion)
	ACE 10	√	√		√ (portion)
	ACE 2	√	√		√
	EXC ACE 3	√	√		√
	URA 3	√	√		√ (portion)
	URA 5	√	√		√
EXC URA 5	√	√		√	
Total		20	19	1	19

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 3.2

³ Verna/Bolger and Lower Ace Creek area property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.3.

⁴ Eagle area property with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.4.

⁵ Martin Lake area properties with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.5.

* Water quality regulatory acceptance criteria not applicable for properties under consideration.

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 [4], 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 and incorporated into section 3.8 of this CMD. CNSC staff conclude 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.

Property EXC 2, the one property not destined for ICP, poses no health, safety or environmental risk above that of its natural surroundings. The property meets clearance levels and, in accordance with subsection 5.1(1) of the NSRDR, no licence or regulatory oversight is needed in relation to this property. It is proposed that this property will be removed from the licence by redefining the licensed areas within Appendix A of Waste Facility Operating Licence WFOL-W5-2120.0/2023, as this property does not require licensing by the CNSC. An exemption is not being requested as the property will not be transferred into the ICP.

1.6 Overall Recommendations

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.0/2023 to remove 20 properties from the figure within Appendix A;
- exempt the government of Saskatchewan from licensing under the NSCA for the 19 properties, or portions therein, proposed for transfer into Saskatchewan's Institutional Control Program; and
- accept amended Waste Facility Operating Licence WFOL-W5-2120.1/2023, which has been updated to the current CNSC standard licence format.

The properties to be exempted to enable transfer to the ICP and/or released from licensing are described in table 1.1 (section 1.5). Figure 1.2 shows the 19 properties which will require an exemption for the government of Saskatchewan from CNSC licensing and the one property which can be released from CNSC licensing without also being subject of exemption and transfer to the ICP.

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 which was presented to the Commission on October 1, 2014 [3] and is provided in this section.

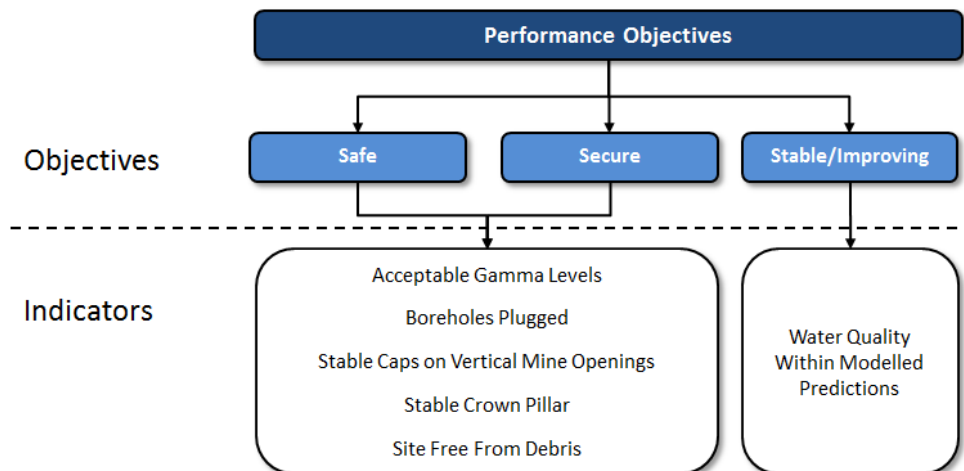
The following definitions are used to evaluate the properties at the Beaverlodge site:

- **Performance Objectives** - The objectives for all Beaverlodge licensed properties is that they be safe and 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.

Environmental performance of the Beaverlodge site is also communicated to the Commission in CNSC’s uranium mines and mills regulatory oversight reports. Figure 2.1 is an illustration of the performance objectives and associated performance indicators.

Figure 2.1: Performance objectives and indicators



Further explanation on the performance indicators and the criteria to satisfy them are provided in table 2.1. The 2019 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	<p><i>2014 Description:</i> 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.</p> <p><i>2019 Status:</i> Site wide gamma scan completed and report submitted to CNSC in 2014 [19]. Beaverlodge site gamma radiation risk evaluation report submitted to CNSC in 2015 [20]. Both reports were accepted by CNSC staff in 2015 after responses to CNSC comments were addressed.</p>	Reasonable use scenario demonstrating gamma levels at the site are acceptable.
Boreholes Plugged	<p><i>2014 Description:</i> Cameco will plug all identified boreholes on the site to prevent groundwater outflow to the surface.</p> <p><i>2019 Status:</i> All boreholes identified to date have been sealed.</p>	All boreholes have been plugged at the time of transfer to institutional control.
Stable Caps on Vertical Mine Openings	<p><i>2014 Description:</i> 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.</p> <p><i>2019 Status:</i> Installation of stainless steel caps initiated in 2016 and most are expected to be installed by the end of 2019. For completeness, CNSC staff have proposed that the performance indicator be expanded in scope to include all mine openings and be reworded to Stable Mine Openings.</p>	Caps have been replaced and signed off by a qualified person.
Stable Crown Pillar	<p><i>2014 Description:</i> Based on the surface subsidence in the Lower Ace Creek area, a crown pillar assessment will be completed for the four areas that have mine workings close to surface including HAB, Dubyna, Bolger/Verna, 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.</p> <p><i>2019 Status:</i> Crown pillar assessment completed in 2014 and report submitted in 2015 [21]. Martin Lake area included in assessment in addition to the areas identified above. Report accepted by CNSC staff in 2016 once comments were addressed.</p>	Crown pillar assessed, remediated if required, and signed off by a qualified person.
Site Free From Debris	<p><i>2014 Description:</i> 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.</p> <p><i>2019 Status:</i> Closure reports submitted in support of release and/or exemption from licensing describe debris removal efforts and provide visual evidence of the inspection efforts.</p>	Site free of former mining debris at the time of transfer to institutional control.
Water Quality Within Modelled Predictions	<p><i>2014 Description:</i> Trends established from past and future water monitoring will be compared to modeled predictions to verify:</p> <ol style="list-style-type: none"> 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. <p><i>2019 Status:</i> Reports submitted annually by Cameco which compare water quality with modelled predictions. Most stations are within modelled predictions with follow-up / reassessment of risk required at select stations that are currently not meeting predictions. Environmental Performance Report which included an updated Environmental Risk Assessment was submitted in October 2018 [22] and is undergoing CNSC review (refer to section 2).</p>	Water quality data is stable/improving.

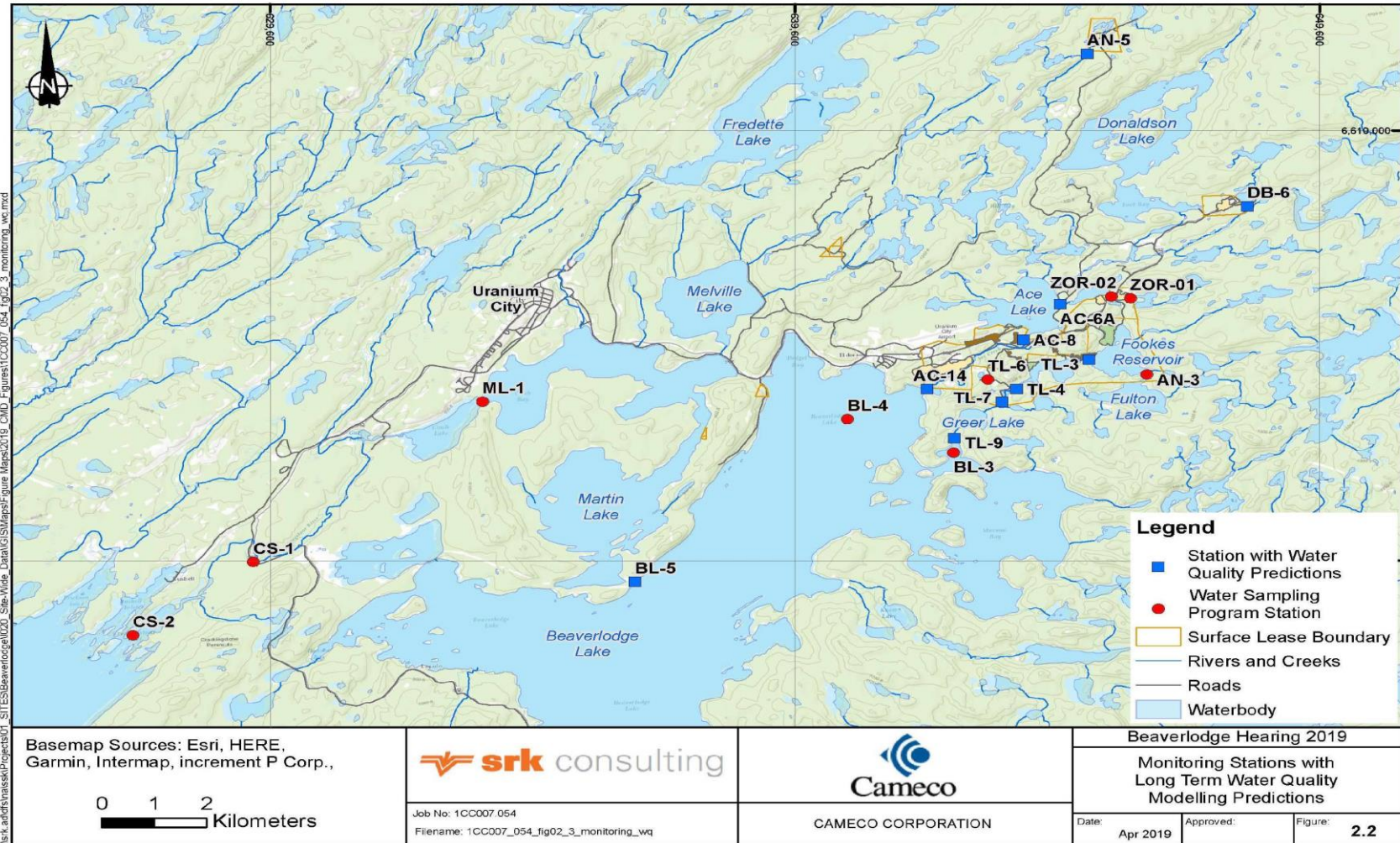
Note: Refer to glossary/abbreviations section for definitions of the mining terminology used in this table.

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 have been established at the Beaverlodge site which have long term water quality predictions for uranium, radium-226 and selenium. These stations are shown on figure 2.2.

Water quality results will be discussed in detail when Cameco proposes the release of properties for which the established water quality performance criteria are applicable. However, the proposed properties to be transferred to ICP do not affect water quality either because the sites are not adjacent to a water body or, if the sites are adjacent, adequate remediation was completed to limit releases to surface water. Since Cameco is only requesting the release of sites that have minimal to no impact on any established water quality monitoring station at the Beaverlodge site, water quality and/or a comparison with water quality predictions is not discussed within this CMD. The one exception, as discussed in section 3.4, is water quality within the flooded Eagle 1 open pit.

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



3 MATTERS FOR CONSIDERATION

The 20 properties that are 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 the applicable objectives and regulatory acceptance criteria for each of the properties. As described in section 2, the proposed properties to be transferred to the ICP do not affect water quality either because the sites are not adjacent to a water body or, if the sites are adjacent, adequate remediation was completed to limit releases to surface water. Therefore, the water quality criteria are not considered for the 20 properties.

As noted in section 1.1, the Beaverlodge site consisted of 65 separate CNSC licensed properties. These properties are grouped into areas of the site. These areas are the HAB, Dubyna, Verna/Bolger, Eagle, Martin Lake, Lower Ace Creek and 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. Mining activities also occurred at the HAB, Dubyna, Eagle and Martin Lake areas, although these 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.

3.1 HAB

The HAB area properties, shown on figure 3.1, consists of seven properties of which Cameco has requested that three (HAB 6, HAB 3 and HAB 2A) be released from CNSC licensing. Property EXC 2 is proposed for release from CNSC licensing by removing the property from Appendix A of the Waste Facility Operating Licence WFOL-W5-2120.0/2023; however this property is not proposed for transfer to the ICP and, as such, no exemption is being requested. No mining or milling activities occurred at this property and the province has determined that the property does not require institutional control. Table 3.1 provides a summary of each property under consideration along with a comparison to the accepted performance indicators.

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

Area	Property	Performance Objective						Release from Licensing		Transfer to ICP
		Safe & Secure			Stable / Improving					
		Performance Indicator						Release & Exempt Province from Licensing	Release without Exemption	
		Acceptable Gamma Levels	Boreholes Plugged	Stable Mine Openings*	Stable Crown Pillar	Site Free from Debris	Water Quality Within Modelled Predictions			
HAB ¹	HAB 3	√	√	n/a	√	√	n/a	√		√ (portion)
	HAB 6	√	√	n/a	n/a	√	n/a	√		√ (portion)
	EXC 2	√	√	n/a	n/a	√	n/a		√	No
	HAB 2A	√	√	√	√	√	n/a	√		√
Dubyna ²	JO-NES	√	√	√	√	√	n/a	√		√ (portion)
Verna/Bolger ³	Bolger 2	√	n/a	n/a	n/a	√	n/a	√		√
	ACE 5	√	√	n/a	√	√	n/a	√		√
Eagle ⁴	Eagle 1	√	√	√	n/a	√	n/a	√		√ (portion)
Martin Lake ⁵	RA 6	√	n/a	√	√	√	n/a	√		√ (portion)
	RA 9	√	√	√	√	√	n/a	√		√ (portion)
Lower Ace Creek ³	ATO 26	√	n/a	n/a	n/a	√	n/a	√		√ (portion)
	EXC ATO 26	√	n/a	n/a	√	√	n/a	√		√
	URA MC	√	√ **	n/a	√	√	n/a	√		√
	EXC ACE 1	√	n/a	n/a	n/a	√	n/a	√		√ (portion)
	ACE 10	√	n/a	n/a	n/a	√	n/a	√		√ (portion)
	ACE 2	√	n/a	n/a	√	√	n/a	√		√
	EXC ACE 3	√	n/a	n/a	√	√	n/a	√		√
	URA 3	√	√	√	√	√	n/a	√		√ (portion)
	URA 5	√	√	n/a	√	√	n/a	√		√
EXC URA 5	√	√	n/a	√	√	n/a	√		√	

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 3.2.

3. Verna/Bolger and Lower Ace Creek area property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.3.

4. Eagle area property with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.4.

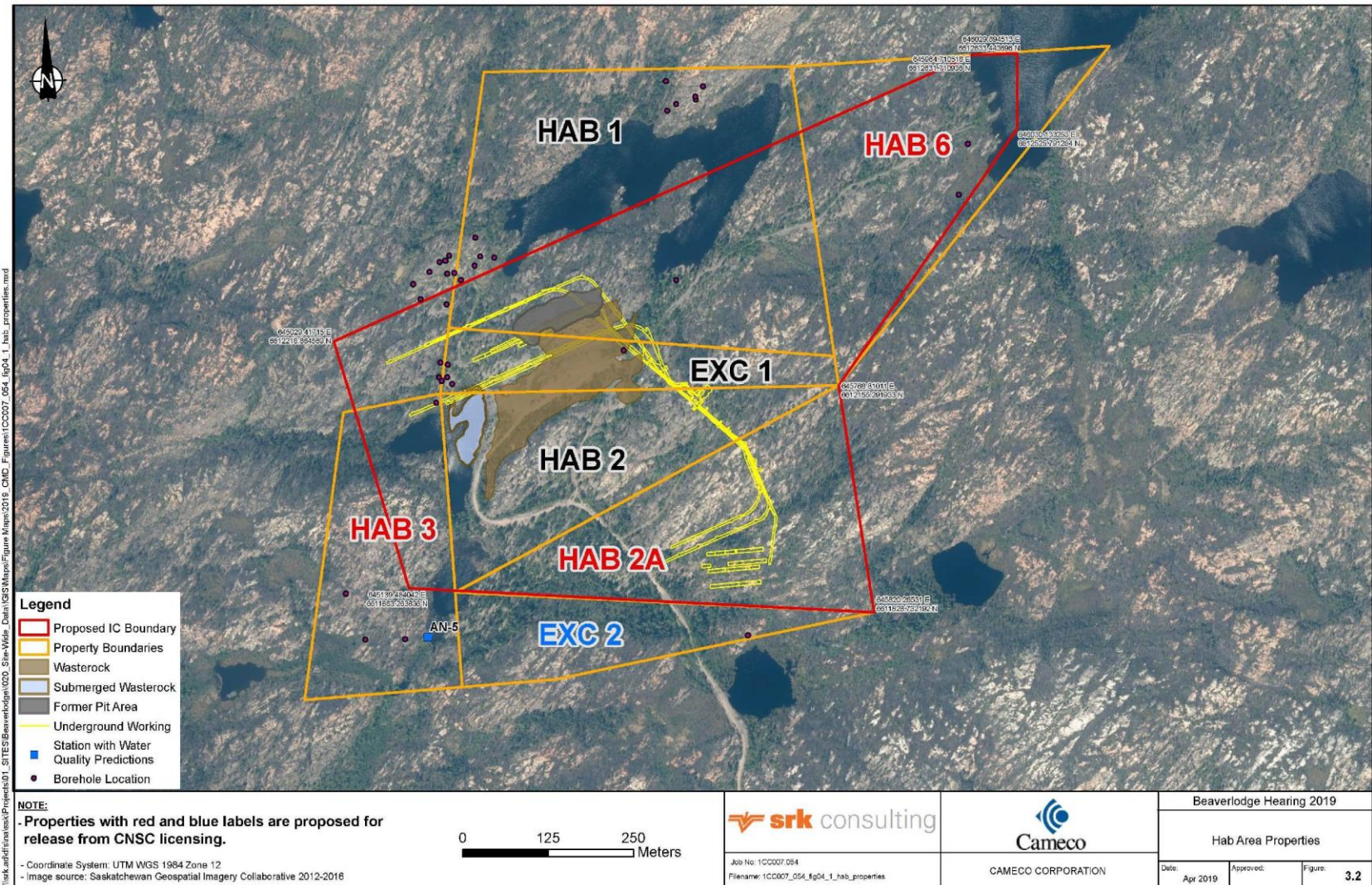
5. Martin Lake area properties with the existing property boundaries and the proposed areas to be transferred to ICP are shown in figure 3.5.

n/a not applicable

* Revised performance indicator from Stable Caps on Vertical Mine Openings to Stable Mine Openings to be more comprehensive.

** Boreholes located adjacent to property and these were sealed.

Figure 3.1: HAB area properties



3.1.1 HAB 3

The HAB 3 property consists of a 7.8 hectare parcel of land on the western edge of the former HAB mining area. A survey of the underground HAB mine plan superimposed on the surface maps indicates that a section of the HAB mine underground workings extend under a small area of the northern portion of the property (figure 3.1). A 2015 independent geotechnical assessment indicated that the crown pillar is considered to pose a low risk of subsidence [21]. There are no engineered structures on the property and all historic boreholes have been sealed. As there was no surface disturbance, no gamma scan was completed on the property.

While HAB 3 was not disturbed by mining activities, it does contain a portion of Pistol Lake, which contains elevated radium and uranium. Pistol Lake and other affected HAB mine areas will be discussed in depth when Cameco proposes to transfer other HAB properties to the ICP.

The portion of the property that is proposed for entry into the ICP includes the underground workings, as shown on figure 3.1. The remainder of the property is proposed for free release (no transfer to the ICP).

ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- condition of the area of the crown pillar; and
- condition of vegetation.

No maintenance requirements are anticipated for the property once it is in the ICP.

3.1.2 HAB 6

The HAB 6 property consists of a 10.8 hectare parcel of land on the northeast edge of the former HAB mining area. No mining occurred on the property but it does contain a former access trail to Milmine Lake which is primarily composed of waste rock. Waste rock testing indicated that the uranium concentration in the rock used to create the trail is 0.042 percent, which is in the low range of what is currently considered special/mineralized waste rock (>0.03 percent uranium) at operating uranium mines in northern Saskatchewan. The small amount of waste rock used in the trail is not considered to pose a risk and there has been no visible impact to the adjacent vegetation observed since the HAB site was decommissioned. There are no engineered structures remaining on the property.

Based on the results of the gamma surveys conducted in 2014 on the HAB mining area [19] the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation [23]. 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 is from a 100 metre by 100 metre area (1 hectare). Four reference areas (Dubya, HAB, Lower Ace Creek

and Bolger/Verna) were established and scanned as part of the 2014 gamma survey. The gamma radiation levels from these reference areas were used to establish an average background concentration of 0.14 $\mu\text{Sv/hr}$ for the Beaverlodge project. The gamma radiation levels averaged over a 1 hectare area on the access trail ranged from $<0.1 \mu\text{Sv/hr}$ to $0.3 \mu\text{Sv/hr}$ above background.

There are no water quality predictions related to the property.

A portion of the property is proposed for entry into the ICP which includes the access trail, as 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;
- evidence of disturbance of the waste rock used to construct the trail;
- condition of the waste rock used to construct the trail; and
- condition of vegetation on the trail.

No maintenance requirements are anticipated for the property once it is in the ICP.

3.1.3 EXC 2

The EXC 2 property consists of a 4.6 hectare parcel of land on the southern edge of the former HAB mining area. The property was not disturbed by mining activities other than the construction and operation of a transmission line corridor and a short portion of the HAB area access road which transects the property (figure 3.1).

Based on the results of the gamma surveys conducted in 2014 on the HAB mining area, the disturbed area of the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The access road to the HAB site was included in the gamma survey and gamma levels averaged over a 1 hectare area ranged from $<0.1 \mu\text{Sv/hr}$ to $0.3 \mu\text{Sv/hr}$ above background.

The entire property is proposed for free release as there are no requirements for institutional control.

3.1.4 HAB 2A

The HAB 2A property consists of a 9.9 hectare parcel of land located immediately to the north of EXC 2 in the former HAB mining area (figure 3.1). The property is adjacent to Pistol Creek, situated downstream of Pistol Lake.

During operations, the property overlaid the 038 Zone of the HAB underground mine and there is one mine opening (raise) at surface. A stainless steel cap was installed over the backfilled raise in 2017. Surface disturbance was limited to the single raise and the HAB site access road. The 2015 independent geotechnical assessment indicated that the crown pillar thickness is approximately 50 metres. The report concluded that there is a low likelihood of subsidence and therefore the property is not considered to represent a subsidence hazard [20].

Based on the results of the gamma surveys conducted in 2014 on the HAB mining area, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to 0.3 $\mu\text{Sv/hr}$ above background.

The entire HAB 2A property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

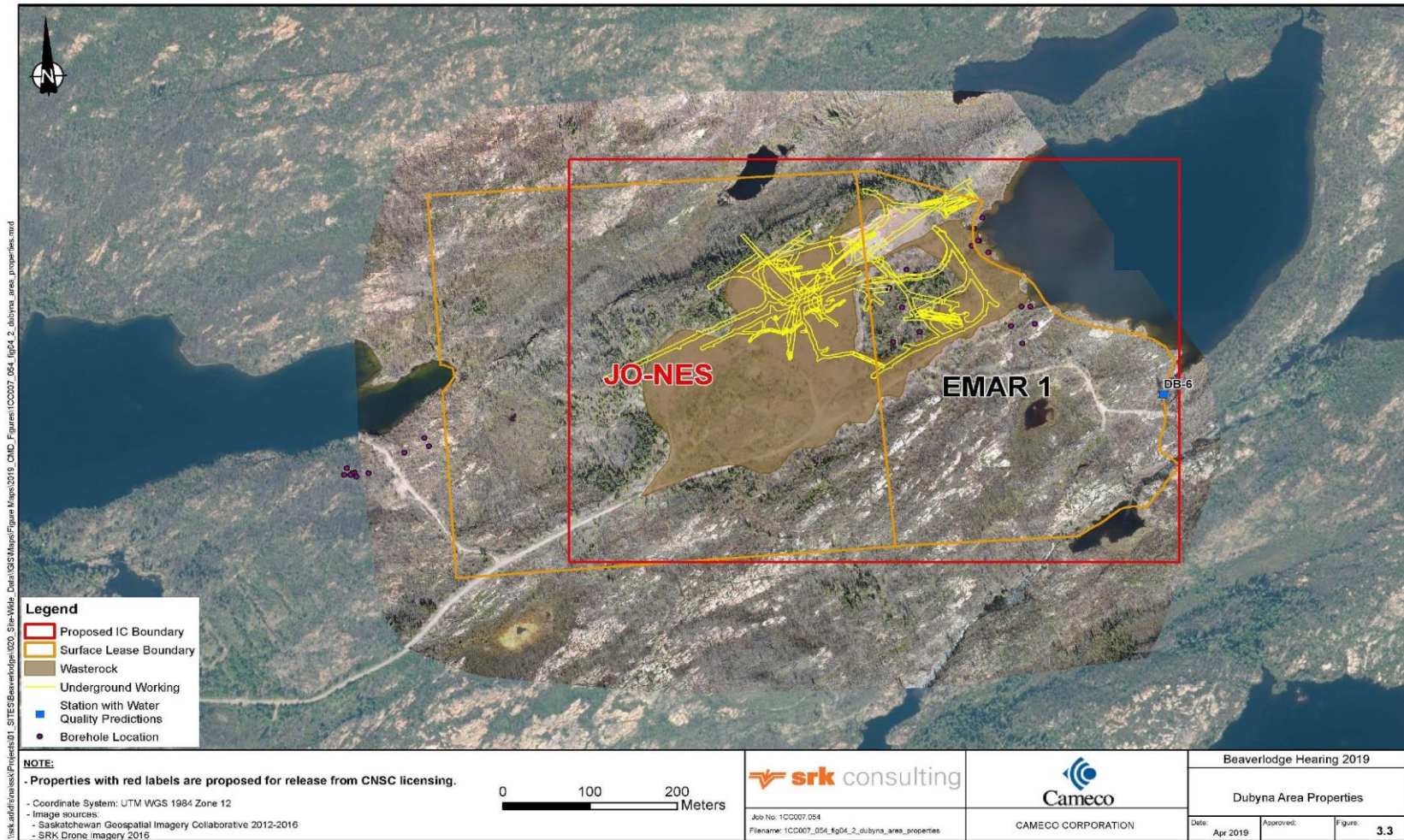
- evidence of recent human visitation;
- the condition of the stainless steel cap installed on the raise;
- condition of the waste rock used to construct the trail; and
- condition of vegetation.

Maintenance requirements are anticipated to include replacement of the stainless steel caps in approximately 1,200 years and engineering inspections of the cap every 50 years.

3.2 Dubyna

The Dubyna area consists of two properties, JO-NES and EMAR 1. Cameco has requested that only the JO-NES property be released from CNSC licensing at this time. The Dubyna area properties are shown on figure 3.2.

Figure 3.2: Dubyna area properties



3.2.1 JO-NES

The JO-NES property consists of a 24 hectare parcel of land which encompasses the majority of the disturbed area of the former Dubyna mine site. Underground mining was conducted on the property. The openings to the underground mine consisted of an adit and two ventilation raises. During decommissioning, the adit entrance was backfilled with waste rock and concrete caps installed over the two ventilation raises. Stainless steel caps were installed over the existing concrete caps in 2017. A small portion of a backfill open pit on EMAR 1 also extends into JO-NES. Approximately 359,000 tonnes of waste rock was generated by the underground mine and open pits on the EMAR 1 property.

Waste rock characterization has been completed and the uranium concentration in the rock is 0.009 percent which is below what is currently considered special/mineralized waste rock (>0.03 percent uranium) and has a low potential for acid generation. In addition, it is noted that visual observation and monitoring for over 60 years has not identified any such leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition.

The minimum crown pillar thickness ranges from approximately 16 metres to 41 metres from the surface. The shallowest crown pillar thickness is located below the completely backfilled open pit, which would mitigate any future crown pillar collapse. The 2015 independent geotechnical assessment completed by SRK Consulting concluded that there were no areas of concern related to crown pillars identified on the JO-NES property [21].

Based on the results of the gamma surveys conducted in 2014 on the HAB mining area, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to a maximum of 1 $\mu\text{Sv/hr}$ above background.

The property EMAR 1 is adjacent to Dubyna Lake for which performance objectives have been established. However no aspects or features on JO-NES are expected to impact Dubyna Lake water quality.

The majority of the property is proposed for entry into the ICP and the remainder of the property, of which there was no mining disturbance, is proposed for free release. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- general pit wall stability;
- evidence of significant pit wall failure;
- evidence of significant sloughing of waste rock within the former pit and condition of waste rock;
- condition of the stainless steel caps;
- condition of the closed adit;
- condition of crown pillar; and
- condition of vegetation.

Maintenance requirements are anticipated to include replacement of the two stainless steel caps in approximately 1,200 years and engineering inspections of the caps every 50 years.

3.3 Verna/Bolger

The Verna/Bolger area consists of seven properties, of which Cameco has requested that two (Bolger 2 and Ace 5) be released from CNSC licensing. The Verna/Bolger and Lower Ace Creek area properties are shown on figure 3.3.

3.3.1 Bolger 2

The Bolger 2 property consists of a 1.6 hectare parcel of land, containing a small backfilled pit referred to as a 'spur' pit, to the east of the main Bolger pit (figure 3.3). There are no underground mine workings associated with the property.

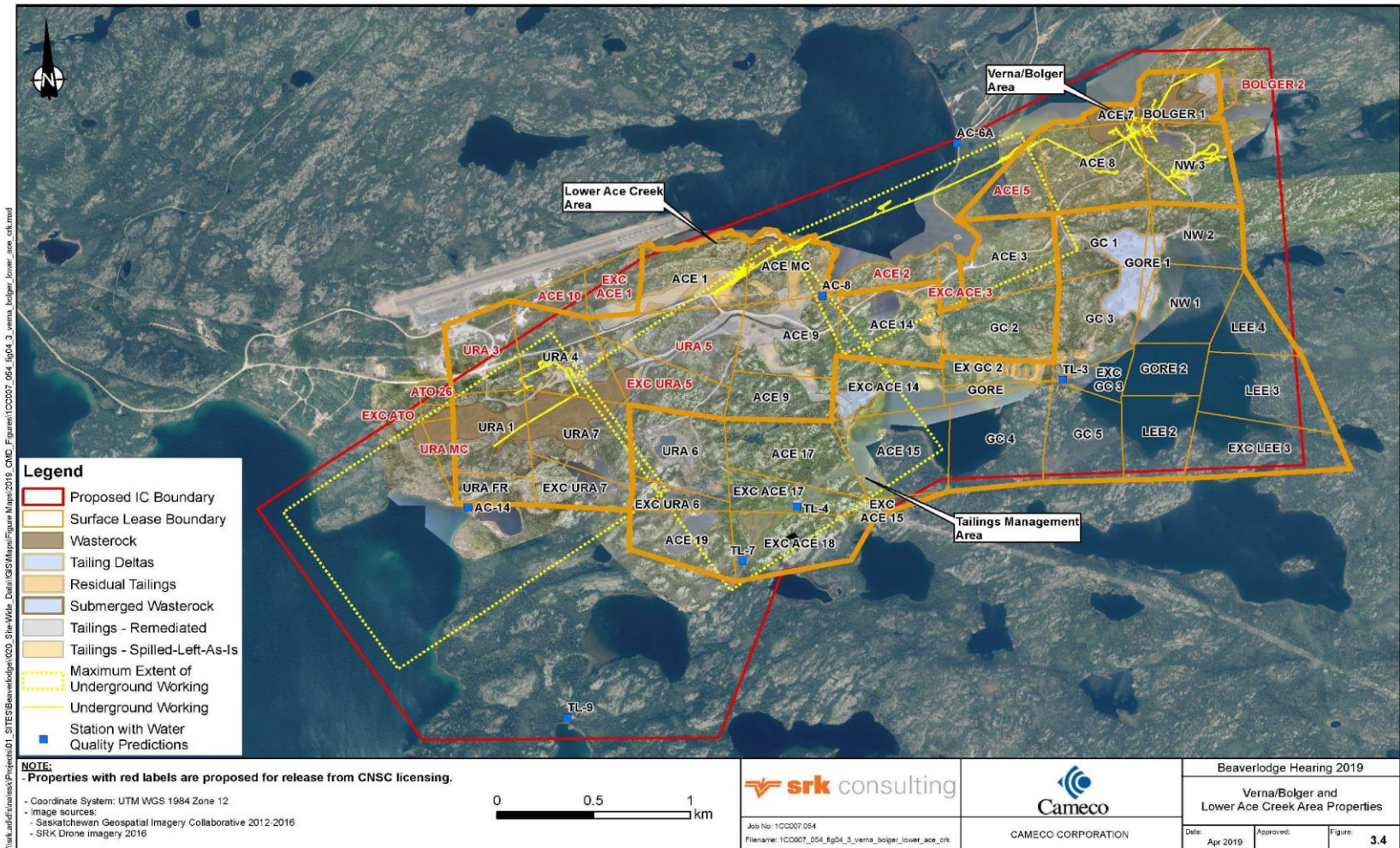
Although the pit was backfilled, due to the topography high on the north side of the pit, a portion of the pit wall remains. In 2010, an independent geotechnical assessment was conducted of the Bolger pit, including the spur pit located on the Bolger 2 property. The assessment concluded that the slopes are expected to be stable in the long term and no remedial action was recommended [24].

There is waste rock remaining on the property, the majority of which was placed in the spur pit. The waste on surface was assessed and instability was considered to be a very low risk by the independent consultant who completed the assessment.

Cameco completed waste rock characterization in support of decommissioning of the Bolger properties and as part of the Bolger/Verna stream diversion project and it was concluded in Cameco's report that the waste rock has a low potential for acid generation. Results indicated that the samples were not potentially acid generating although elevated concentrations of uranium in Bolger pit of 0.062 percent indicated an increased potential for leaching of this element. Other waste rock near the site has uranium ranging from 0.004 to 0.017 percent which is below what is currently considered special/mineralized waste rock (>0.03 percent uranium). In addition, it is noted by Cameco that visual observation and monitoring for over 30 years have not identified any such leachate from waste rock piles, nor have there been any impacts that could be attributed to such a condition.

Based on the results of the gamma surveys conducted in 2014, the gamma radiation levels on the property averaged over a 1 hectare area ranged from 0.3 $\mu\text{Sv/hr}$ to a maximum of 3 $\mu\text{Sv/hr}$ above background. The area consists of waste rock, is limited in size and is considered remote. At the request of the CNSC, portions of the property that were disturbed as a result of the Zora Creek flow path reconstruction project were rescanned in 2016 and the results were consistent with the 2014 scan.

Figure 3.3: Verna/Bolger Area and Lower Ace Creek properties



Based on the site specific and cumulative doses calculated on average dose rates, reported usage for all Beaverlodge sites and calculated doses for a member of the public would not exceed 0.3 mSv per year, well below the dose limit of 1 mSv per year to members of the public. Results of the 2014 gamma scan indicate an individual would have to spend more than two weeks per year on the area with elevated gamma radiation levels in order to exceed the public dose limit, which is unlikely given the limited use of the site.

The entire Bolder 2 property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- general pit wall stability;
- evidence of significant pit wall failure;
- evidence of significant sluffing of waste rock slope and condition of waste rock; and
- condition of vegetation.

No maintenance requirements are anticipated for the property once it is in the ICP.

3.3.2 Ace 5

The Ace 5 property consists of an 11.3 hectare parcel of land located between the Ace Lake and Verna/Boldger mining area. Two separate utility corridors were present on the property. The property does not contain any roads or any other mining related infrastructure or disturbance on surface.

A survey of the Fay/Ace/Verna mine plan superimposed on the surface maps indicates that the third level of the west section of the Fay mine underground workings may extend under the property at an approximate depth of more than 100 metres (figure 3.3). A 2015 independent geotechnical assessment commissioned by Cameco [21] concluded that the crown pillar is considered to pose a low likelihood of subsidence due to the depths of the underground workings and the report also noted that no additional investigation or remediation was required.

As there was no surface disturbance to the property, other than the use of the property as a utility corridor, no gamma scan was completed.

Due to the potential for underground mine infrastructure being beneath the property, administrative controls are proposed to restrict future land use. However no monitoring or maintenance activities are anticipated by the province for the property once it is in the ICP.

3.4 Eagle 1

The Eagle 1 property consists of a 9.8 hectare parcel of land located northwest of the Fay mining area (figure 3.4). The property is located to the east of the Eagle 4 and Eagle 7 property and to the west of the Eagle property, both of which were

exempted from licensing under the NSCA by the Commission [25] and have been in the ICP since 2009.

The property consists of a flooded open pit (12 Zone pit), a waste rock backfilled open pit (12 Zone pit extension) and waste rock placed on the surface during mining of the pit. There was also an adit opening within the 12 Zone pit that was sealed by blasting the sides of the pit and filling the remaining voids with waste rock. The drainage area to the 12 Zone pit is restricted to the pit footprint and there is no known surface connection with any regional waterbodies. Cameco stated that the water levels in the pit are typically more than 4 metres below the pit crest.

An independent geotechnical assessment of the 12 Zone pit was presented to the CNSC in 2000 along with the proposed remedial actions to the pit wall [26]. The remedial work was completed in 2001.

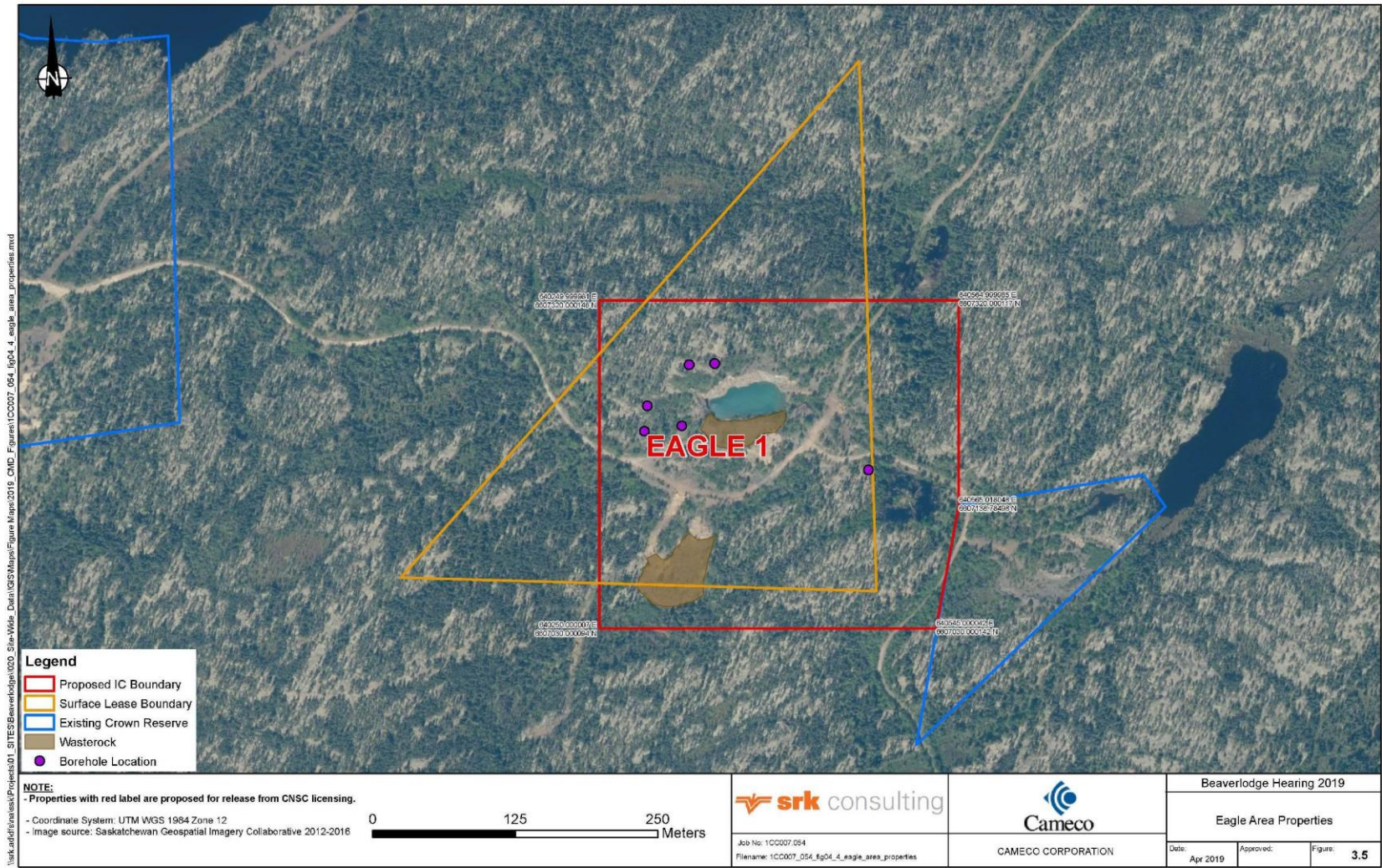
The flooded 12 Zone pit has a maximum depth of 9 metres with a surface area of approximately 2,000 square metres. There are no water quality performance indicators for the pit as it is not connected to an open flow channel, and therefore it is highly unlikely that any fish species will ever reside in the pit. However, water quality results from the pit were analyzed in order to assess risks from factors such as increased frequency of extreme rainfall events due to climate change and to assess risks from humans consuming the water.

There is currently little chance of the pit overtopping and discharging water to the surrounding environment as such an event would require significant precipitation to increase the volume of water within the pit. If the pit were to overflow at some point in the future, the water would travel overland in a southeasterly direction, enter a series of two wetland areas where it would likely be further diluted before entering Berth Lake, a small lake located approximately 1.2 kilometres south of the pit.

Water quality results collected from surface of the pit between 1995 and 2015 indicate that uranium concentrations ranged between 134 µg/L and 856 µg/L and radium-226 ranged from 0.29 Bq/L to 0.65 Bq/L, consistently above the Saskatchewan Environmental Quality Guidelines for Freshwater Aquatic Life [27] of 15 µg/L and 0.11 Bq/L, respectively. The concentration of uranium and radium-226 are also above the Saskatchewan Environmental Quality Guidelines for potable water [27] of 20 µg/L and 0.5 Bq/L, respectively. The water quality data for the pit is presented in Cameco's 2016 closure report [7].

In order to assess the risk to humans as a result of the pit water quality, CNSC staff calculated the amount of full time occupancy required which would result in a dose of 10 µSv to be reached if the pit were used as a sole source of drinking water. A minimum of approximately six days would be required for any person to receive a dose of 10 µSv from water consumption alone. The maximum usage of any Beaverlodge property based on the land use survey conducted by Cameco (section 3.10) was 50 hours, therefore the level of risk is considered to be quite low, in the unlikely event that someone chooses to consume water from the pit.

Figure 3.4: Eagle area property



Waste rock characterization has been completed and it has been concluded that the waste rock has low concentrations of uranium and has a low potential for acid generation. The uranium content was 0.009 percent which is below what is currently considered special/mineralized waste rock (>0.03 percent uranium). In addition, it is noted by Cameco that visual observation and monitoring for approximately 30 years have not identified any leachate from waste rock piles, nor has there been any impacts that could be attributed to such acid rock drainage.

In 2014 gamma surveys were conducted on all disturbed areas at the property by an independent consultant retained by Cameco. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to 1 $\mu\text{Sv/hr}$ above background.

The majority of the property is proposed for entry into the ICP and the remainder of the property, of which there was no mining disturbance, is proposed for free release. All areas with waste rock will be in the ICP, including an area not currently under CNSC licence. ICP inspections are expected to focus on the following aspects:

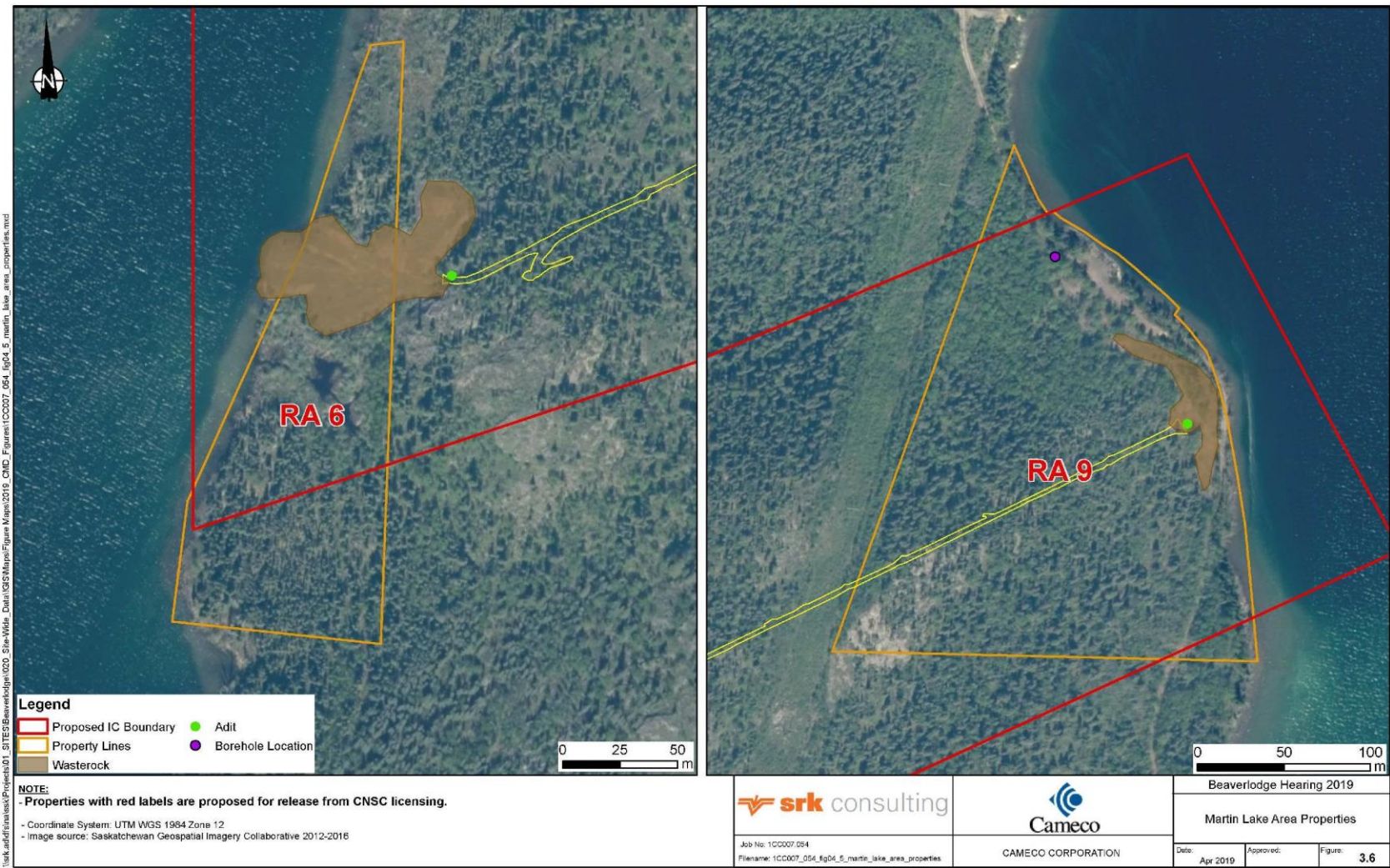
- evidence of recent human visitation;
- general pit wall stability;
- evidence of significant pit wall failure;
- condition of sand cover over areas of elevated gamma radiation;
- status of the flooded pit, including water quality; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.5 Martin Lake

The former Martin Lake mine is comprised of two properties (RA 6 and RA 9). Cameco requested that both these properties be released from CNSC licensing and transferred to the ICP. An underground mine connected the two properties straddling the narrow strip of land separating Martin Lake from Beaverlodge Lake. Each site contains an adit which was used to access the underground mine. The location of the properties is shown on figure 1.1 and the boundaries of property lines are shown on figure 3.5.

Figure 3.5: Martin Lake – boundaries of property lines



3.5.1 RA 6

The RA 6 property consists of a 1.5 hectare parcel of land located on the shore of Martin Lake (figure 3.5). There is no road access to the RA 6 property. The property has waste rock at the entrance to the underground mine and the waste rock extends slightly into Martin Lake. The adit opening was sealed in 2000 by constructing a steel grate over the opening.

In 2014 gamma surveys were conducted on all disturbed areas at the property by an independent consultant retained by Cameco. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to 1 $\mu\text{Sv/hr}$ above background.

The 2015 independent geotechnical assessment report concluded that the Martin Lake crown pillar between RA 6 and RA 9 has a low likelihood of subsidence and that no additional investigation or remediation was required.

Waste rock characterization has been completed and it has been concluded that the waste rock has low concentrations of uranium (0.042 percent) which is in the low range of what is currently considered special/mineralized waste rock (>0.03percent) and has a low potential for acid generation, based on test work conducted at the time of decommissioning. In addition, it is noted that visual observation and monitoring for over 30 years has not identified any leachate from waste rock piles and there are no impacts that could be attributed to such a condition.

The majority of the property is proposed for entry into the ICP. All areas with waste rock will be in the ICP and the entire extent of the underground mine, including the area not currently under CNSC licence. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- adit closure condition;
- condition of crown pillar;
- evidence of significant slumping of waste rock slopes;
- evidence of surface seeps from the adit; and
- condition of vegetation.

The steel grate used to close the adit entrance will require maintenance. It has been assumed that the steel grate will require replacement every 75 years.

3.5.2 RA 9

The RA 9 property consists of a 4.5 hectare parcel of land located on the shore of Beaverlodge Lake (figure 3.5). The property has waste rock at the entrance to the underground mine. The adit opening was resealed in 2010 by backfilling the entrance with waste rock.

The crown pillar between RA 6 and RA 9 has a low likelihood of subsidence and the waste rock has low concentration of uranium as well as a low potential for acid generation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from $<0.1 \mu\text{Sv/hr}$ to $1 \mu\text{Sv/hr}$ above background.

The majority of the property is proposed for entry into the ICP. All areas with waste rock will be in the ICP and the entire extent of the underground mine, including the area not currently under CNSC licence. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- adit closure condition;
- condition of crown pillar;
- evidence of significant slumping of waste rock slopes;
- evidence of surface seeps from the adit; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6 Lower Ace Creek

The Lower Ace Creek area consists of 20 properties, of which Cameco has requested that 10 be released from CNSC licensing. The properties under consideration are EXC ATO 26, EXC ACE 1, ACE 10, URA 5, EXC URA 5, ATO 26, URA MC, URA 3, ACE 2 and EXC ACE 3 as shown on figure 3.3. Table 3.1 provides a summary of each property under consideration along with a comparison to the accepted performance indicators.

3.6.1 EXC ATO 26

The EXC ATO 26 property consists of a 1.4 hectare parcel of land located on the western edge of the former Fay mine and Beaverlodge mill (figure 3.3). The northern portion of the EXC ATO 26 property is undisturbed while the southern portion consists of a flat area of waste rock which extends beyond the property boundary to the west where it ends in a gradually increasing slope. The property contains waste rock as well as a portion of the decommissioned Fay Salvage Yard.

In 2014 gamma surveys were conducted at the property on all disturbed areas by an independent consultant retained by Cameco. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the property averaged over a 1 hectare area ranged from $0.3 \mu\text{Sv/hr}$ to $1 \mu\text{Sv/hr}$ above background.

In 2010, an inspection and assessment of the waste rock pile stability in the Lower Ace Creek area, which included the waste rock slope west of the EXC ATO 26 property, was conducted. The assessment concluded that the height of the western portion of the waste rock is approximately 30 metres at the highest point; however

the maximum height of the waste rock on EXC ATO 26 is approximately 10 metres. It was noted that the side of the pile is at an angle equivalent to the natural angle of repose for loose waste rock, which is the maximum slope angle at which the dry, unconsolidated material is stable. The assessment concluded that the only risk in terms of stability is predominantly associated with the potential for an occasional rolling rock [28].

Waste rock characterization has been completed and it has been concluded that the waste rock has low concentrations of uranium (i.e. uranium concentration of 0.015 percent) which is below what is currently considered special/mineralized waste rock (>0.03 percent uranium) and has a low potential for acid generation, based on test work conducted at the time of decommissioning. In addition, it is noted that visual observation and monitoring for over 30 years has not identified any leachate from waste rock piles, and there have been no impacts that could be attributed to such a condition.

The entire EXC ATO 26 property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- evidence of significant waste rock slope failure; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6.2 EXC ACE 1

The EXC ACE 1 property consists of an 8.7 hectare parcel of land located south of the Uranium City airport (figure 3.3). No surface mining activities were conducted at the property and there are no underground workings present. However there are tailings present on the southeast corner of the property as a result of historic spills.

During 1983 and 1984, reclamation of the spilled tailings within the EXC ACE 1 property was completed as part of the Ace Stope Area reclamation. All accessible tailings were covered with 600 millimetres of waste rock. During decommissioning, because of the inaccessibility of some tailings, those on which vegetation had naturally occurred or tailings within heavily wooded areas were assessed on an individual basis to determine whether they should be left as is, covered or removed. If a decision was made to leave a particular area “as is”, the decision was made 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.

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 [29]. The area of exposed tailings is limited in size, generally located in a very wet environment, heavily vegetated and only accessible by a difficult walk.

The EXC ACE 1 property was not used for waste rock storage although waste rock was hauled onto the property to cover portions of the spilled tailings during the initial decommissioning of the Beaverlodge site.

In 2014 a gamma survey was conducted by an independent consultant retained by Cameco on all disturbed areas at the property. The gamma levels on the EXC ACE 1 property ranged from 0.3 $\mu\text{Sv/hr}$ to 3 $\mu\text{Sv/hr}$ above background. Most of the property was below 1 $\mu\text{Sv/hr}$ with a small portion of the EXC ACE 1 property which had incremental gamma values between 1 $\mu\text{Sv/hr}$ and 3 $\mu\text{Sv/hr}$. This portion consists of an area of waste rock covered spilled tailings as well as some spilled tailings which were not covered during the original decommissioning.

The area is limited in size, generally located in a very wet environment, heavily vegetated and only accessible by a difficult walk. The limited access and inhospitable nature of the area combined with the fact that there is no recorded visits by Uranium City residents in the five years prior to the land use study [30] was used to demonstrate that the small area poses little risk to the public. This conclusion is further supported by the site wide gamma risk assessment. Site specific and cumulative doses were calculated based on average dose rates and reported usage for all Beaverlodge sites. Calculated doses did not exceed 0.3 mSv per year, well below the dose limit of 1 mSv per year to members of the public [20].

Based on the results of the 2014 gamma survey, an individual would have to spend more than 330 hours (or approximately 14 days) per year on the small area of highest measured gamma on the property to exceed the allowable public dose limit. Once the property enters the ICP, restrictions will be placed on the use of the property making this level of occupancy very unlikely.

The southern two-thirds of the EXC ACE 1 property will be transferred to ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- evidence of significant waste rock slope failure; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6.3 ACE 10

The ACE 10 property consists of a 5 hectare parcel of land located south of the Uranium City airport (figure 3.3). Cameco has noted that no records exist of any exploration, mining, milling or related activities having taken place on the property. There are no mining openings nor underground workings present below the surface.

A gamma scan of the western portion of the ACE 10 property was conducted in 2014. The gamma radiation levels were at or below the background level for the survey ($<0.14 \mu\text{Sv/hr}$). There are no surface waterbodies on the property and no water quality predictions related to the property.

Located on the southern edge, a small portion of the property is proposed for transfer to the ICP. This is not due to any monitoring, maintenance or land use control requirements for the southern portion of the property. This portion of the property will be transferred to the ICP due to location of the proposed ICP boundary established for the main Beaverlodge areas, as shown in red on figure 3.3.

With the lack of disturbance, no monitoring or maintenance is proposed for the portion of the property that will be transferred to the ICP.

3.6.4 URA 5

The URA 5 property consists of a 20.9 hectare parcel of land located south of the Uranium City airport (figure 3.3). No surface mining activities were conducted at the property; however other infrastructure was developed including the following:

- cell of a sewage lagoon;
- roads;
- powerline corridor; and
- tailings pipeline.

As a result of the presence of the tailings pipeline, small quantities of tailings are present on the property due to historic spills. The location of both waste rock covered tailings and exposed tailings are shown on figure 3.3. During decommissioning, tailings within the Ace Catchment Area I were removed by excavating all material down to the peat layer present around Ace Creek. All accessible exposed tailings, which included tailings within Catchment Areas II and III, the Ace Stope Area as well as some of the spills along the tailings line were covered or removed. The cover consisted of 600 millimetres of sand/gravel, waste rock or muskeg/peat to encourage the natural vegetation of these areas.

Because of the inaccessibility and/or the presence of established vegetation, the tailings were assessed by Cameco on an individual basis to determine whether they should be left as is, covered or removed. If a decision was made to leave a particular area “as is”, the decision was made 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. Small areas of exposed tailings are present in the northern portion of the property.

There are no mine openings to surface, however the sixth level of the Fay underground mine may extend under the property at a depth of approximately 200 metres below surface. In 2014, SRK Consulting was retained by Cameco to undertake a geotechnical assessment for the crown pillar stability at Beaverlodge properties including the Fay shaft areas. That report concluded that the crown pillar in the main Fay shaft area has a “low” likelihood of subsidence due to the depths of the underground workings and stated that no additional investigation or remediation was required. Cameco noted that it has been approximately 34 years since the mine ceased operation and there has been no indication of instability or subsidence identified on the property.

In 2014 a gamma survey was conducted by an independent consultant retained by Cameco on all disturbed areas at the property. The gamma levels on the URA 5 property ranged from $<0.1 \mu\text{Sv/hr}$ to $3 \mu\text{Sv/hr}$ above background. Cameco noted that only small portions of the property ranged from $1.0 \mu\text{Sv/hr}$ to $3.0 \mu\text{Sv/hr}$, are relatively heavily vegetated, and are only accessible by walking.

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 URA 5 property was determined to be limited to using the main access road which transects a small portion of the property. This area is above the provincial guideline value defined in the *Guidelines for Northern Mine Decommissioning and Reclamation*. Site specific doses were calculated based on average dose rates and reported usage for all Beaverlodge sites as part of the Site Gamma Radiation Risk Evaluation. The maximum estimated incremental dose for the Ace Creek area was $0.04 \text{ mSv per year}$, well below the dose limit to members of the public of 1 mSv per year .

Ace Creek passes through a portion of the URA 5 property, however due to the remediation of accessible spilled tailings and, as supported by water quality monitoring of Ace Creek, the 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 monitoring results and how the results compare to the modelled predictions, will be a primary consideration when evaluating any future requests for the release of the main mill area properties from CNSC licensing and the transfer of these properties to the ICP. It is expected that this monitoring and comparison to model predictions will continue after the properties have been transferred to the ICP.

The entire URA 5 property will be transferred to ICP. ICP inspections are expected to focus on the following aspects:

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

No maintenance requirements have been identified for the property.

3.6.5 EXC URA 5

The EXC URA 5 property consists of a 15.0 hectare parcel of land located south of the URA 5 property and is east of the main Fay site (figure 3.3). No surface mining activities were conducted at the property; however other infrastructure was developed including the following:

- portion of the Fay waste rock storage area;
- roads;
- powerline corridor; and
- tailings pipeline.

Due to historic spills from the tailings pipeline, tailings are present on the property. The location of waste rock covered tailings and inaccessible exposed tailings are shown on figure 3.3. Tailings within the Ace Catchment Area I were removed by excavating all material down to the peat layer present around Ace Creek. All accessible exposed tailings, which included tailings within Catchment Areas II and III, the Ace Stope Area as well as some of the spills along the tailings line were covered or removed. The cover consisted of 600 millimetres of sand/gravel, waste rock or muskeg/peat to encourage the natural vegetation of these areas.

Because of the inaccessibility and/or the presence of established vegetation, the tailings were assessed on an individual basis to determine whether they should be left as is, covered or removed. If a decision was made to leave a particular area “as is”, the decision was made 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. Small areas of exposed tailings are present in the northeastern portion of the property.

A portion of the waste rock pile at the mill site extends into EXC URA 5. The waste rock pile was assessed in 2010, and the inspection noted that the waste rock is approximately 20 metres high and about 500 metres long. It was observed that the rock on this pile is relatively uniform in size. No signs of cracking, erosion or sliding were observed. Based on the observations, it was concluded that the waste rock slopes were in good condition, that the rock is durable and there is a very low risk of instability.

Waste rock characterization has been completed and it has been concluded that the waste rock has low concentrations of uranium (i.e. uranium concentration of 0.015 percent) which is below what is currently special/mineralized waste rock (>0.03 percent) and has a low potential for acid generation, based on test work conducted at the time of decommissioning. In addition, it is noted that visual observation and monitoring for over 60 years has not identified any leachate from waste rock piles, and does not have any impacts that could be attributed to such a condition.

There are no mine openings to surface, however similar to property URA 5, the sixth level of the Fay underground mine may extend under the property at a depth of approximately 200 metres below surface. As noted for property URA 5, the crown pillar has a “low” likelihood of subsidence due to the depths of the underground workings.

In 2014, a gamma survey was conducted by an independent consultant retained by Cameco on all disturbed areas at the property. The gamma levels on the EXC URA 5 property ranged from <0.1 $\mu\text{Sv/hr}$ to 1 $\mu\text{Sv/hr}$ above background when averaged over 1 hectare, however a small portion of the property along Ace Creek ranged from 1.0 $\mu\text{Sv/hr}$ to 3.0 $\mu\text{Sv/hr}$ above background (figure 3.3). This area is limited in size, relatively heavily vegetated and only accessible by walking.

Doses were calculated based on average dose rates and reported usage for all Beaverlodge area as part of the Site Gamma Radiation Risk Evaluation. The maximum estimated incremental dose for the Ace Creek area using a conservative approach was 0.04 mSv per year, well below the dose limit of 1 mSv per year to members of the public.

Ace Creek passes through a portion of the EXC URA 5 property, however due to the remediation of accessible spilled tailings and, as supported by water quality monitoring of Ace Creek, the property is not expected to negatively impact the water quality within the creek. As noted in section 3.6.4, water quality of Ace Creek will continue to be monitored at station AC-14 and the results compared to modelled predictions.

The entire EXC URA 5 property will be transferred to ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- evidence of disturbance of tailings spill sites;
- condition of the waste rock and stability; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6.6 ATO 26

The ATO 26 property consists of a 2.3 hectare parcel of land located south of the Uranium City airport and the northern portion of the property contains part of the road to the airport (figure 3.3). Cameco noted that no records exist of any mining, milling or related activities having taken place on the property. There are no mining openings present and no underground workings are thought to be present below the surface. However, a small portion of the southwestern portion of the property is within the theoretical maximum extent of underground workings (which includes a 50 metre buffer around any known workings). The maximum extent of workings for the former Fay mine was requested by SMER to ensure that if there is an uncertainty in the extent of mine workings the buffer will ensure that all of the Beaverlodge mine workings are included in the proposed ICP boundary for the entire site.

In 2014, a gamma scan was conducted by an independent consultant retained by Cameco over the disturbed areas of the site and therefore was limited to the Uranium City airport access road. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels averaged over a 1 hectare area ranged from 0.1 µSv/hr to 0.3 µSv/hr above background.

Approximately half of the ATO 26 property is proposed for transfer to the ICP. This is not due to any monitoring, maintenance or land use control requirements for the southern portion of the property, but is due to the proposed ICP boundary

drawn for the entire Beaverlodge site and the theoretical maximum extent of the underground workings at the very southern edge of the property.

Because of the lack of disturbance, no monitoring or maintenance of the property is proposed for the portion of the property that will be transferred to the ICP. The road to the Uranium City airport is expected to remain in use and its ongoing use will be considered by the province as part of the transfer to the ICP.

3.6.7 URA MC

The URA MC property consists of a 3.7 hectare parcel of land located on the western edge of the former Fay mine and Beaverlodge mill (figure 3.3). The northern quarter of the property consists of a portion of the Fay waste rock pile and the remaining three quarters is relatively undisturbed. The property contains waste rock as well as a portion of the decommissioned Fay Salvage Yard. The Fay underground mine extends under the property, but there are no surface openings to the underground mine.

In 2014, gamma surveys were conducted by an independent consultant retained by Cameco on all disturbed areas at the property. Based on the survey results of the disturbed areas, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the disturbed areas of the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to 1 $\mu\text{Sv/hr}$ above background.

In June of 2010, Cameco retained the services of SRK to conduct an inspection and assessment of the waste rock pile stability. That assessment concluded that the height of the western portion of the waste rock is approximately 30 metres at the highest point (on the URA MC property). It was noted that the side of the pile is at an angle equivalent to the natural angle of repose for loose waste rock, the maximum slope angle at which the dry, unconsolidated material is stable. The assessment concluded that the only risk in terms of stability is predominantly associated with the potential for an occasional rolling rock.

Waste rock characterization has been completed and it has been concluded that the waste rock has low concentrations of uranium (i.e. uranium concentration of 0.015 percent) which is below what is currently considered special/mineralized waste rock (>0.03 percent uranium) and has a low potential for acid generation, based on test work conducted at the time of decommissioning. In addition, it is noted by Cameco that visual observation and monitoring for over 30 years has not identified any leachate from waste rock piles, and does not have any impacts that could be attributed to such a condition.

The western section of the Fay mine is under the property at an estimated depth of 91 metres below surface. In 2014, the crown pillar stability was assessed. It was concluded that the crown pillar in the main Fay shaft area had a “low” likelihood of subsidence due to the depths of the workings in this area, and that no additional investigation or remediation was required. Cameco noted that it has

been approximately 34 years since the mine ceased operation and there has been no indication of instability or subsidence identified on the property.

The entire URA MC property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- condition of plugged drill holes (near property);
- condition of the waste rock and stability; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6.8 URA 3

The URA 3 property consists of a 15.7 parcel of land located east of the Fay mine site and is immediately to the south of the Uranium City airport (figure 3.3). There is currently a Saskatchewan Ministry of Highways and Infrastructure communications tower and shop on the property, which are not the responsibility of Cameco to maintain. The northern portion of the property also contains a portion of the Uranium City airport access road and the southern portion contains the mill access road.

No significant mining or mining related activities took place on the property and portions of the property were not disturbed during operations. There is no record of tailings spills and waste rock deposition, other than the use of waste rock to construct roads. There is one raise to the underground Fay mine located on the property; this raise was covered by a stainless steel cap in 2017.

In 2014 a gamma scan was conducted by an independent consultant retained by Cameco over the disturbed areas of the site. At the request of SMOE, Cameco completed a follow-up scan in 2018 after an area of elevated gamma radiation was removed and the soil placed in underground workings. Based on the results from the surveys, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels averaged over a 1 hectare area were below 1 $\mu\text{Sv/hr}$ above background.

The second level of the west section of the Fay underground mine workings may extend under the property at an estimated depth of more than 45 metres (figure 3.3). A geotechnical assessment for the crown pillar stability concluded that the crown pillar in the main Fay shaft area has a “low” likelihood of subsidence due to the depths of the workings in this area, and that no additional investigation or remediation was required. Cameco noted that it has been approximately 34 years since the mine ceased operation and there has been no indication of instability or subsidence identified on the property.

The northern portion of the URA 3 property is proposed for free release and the southern portion of the property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- condition of the raise cap; and
- condition of plugged drill holes (near property).

Maintenance of the stainless steel cap over the raise opening will be required.

3.6.9 ACE 2

The ACE 2 property consists of a 7.0 hectare parcel of land on the south shore of Ace Lake (figure 3.3). No mining activities took place on the property; however the property did contain an electrical transmission line and a short section of the tailings pipeline. The road from the Uranium City airport to Ace Lake and the Beacon Bible Camp (in active seasonal use) intersects the southern boundary of the property.

Historic tailings spills occurred on the southern portion of the property and these were reclaimed during decommissioning of the site by placing a waste rock cover over the exposed tailings to a depth of 600 millimetres.

In 2014 gamma surveys were conducted by an independent consultant retained by Cameco on all disturbed areas at the property. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the disturbed areas of the property averaged over a 1 hectare area ranged from 0.3 $\mu\text{Sv/hr}$ to 1 $\mu\text{Sv/hr}$ above background.

The 301 DRE drift of the Ace/Verna portion of the underground mine workings may extend under the property at an estimated depth of more than 91 metres (figure 3.3). A geotechnical assessment for the crown pillar stability concluded that the crown pillar has a “low” likelihood of subsidence due to the depths of the workings in this area, and that no additional investigation or remediation was required. Cameco noted that it has been approximately 33 years since the mine ceased operation and there has been no indication of instability or subsidence identified on the property.

All the ACE 2 property is proposed for entry into the ICP. ICP inspections are expected to focus on the following aspects:

- evidence of recent human visitation;
- condition of the waste rock cover over tailings; and
- condition of vegetation.

No maintenance requirements have been identified for the property.

3.6.10 EXC ACE 3

The EXC ACE 3 property consists of a 3.9 hectare parcel of land located on the southern shore of Ace Lake and adjacent to ACE 2. There is no record of any mining or mining related activities occurring on the property. There was no waste rock storage on surface or evidence of tailings spills. The electrical transmission line from the mill to the Verson mine crossed the property and was decommissioned. The road from the Uranium City airport to Ace Lake and the Beacon Bible Camp (in active seasonal use) crosses the property.

In 2014 gamma surveys were conducted by an independent consultant retained by Cameco on all disturbed areas at the property. Based on the survey results, the property meets the criteria identified in the *Saskatchewan Guidelines for Northern Mine Decommissioning and Reclamation* for gamma radiation. The gamma radiation levels on the disturbed areas of the property averaged over a 1 hectare area ranged from 0.1 $\mu\text{Sv/hr}$ to 0.3 $\mu\text{Sv/hr}$ above background.

As with the ACE 2 property, the 301 DRE drift of the Ace/Verna portion of the underground mine workings may extend under the property at an estimated depth of more than 91 metres (figure 3.3). A geotechnical assessment for the crown pillar stability conducted by an independent consultant retained by Cameco concluded that the crown pillar has a “low” likelihood of subsidence due to the depths of the workings and that no additional investigation or remediation was required. Cameco noted that the underground workings have been decommissioned for approximately 33 years and there has been no indication of subsidence on the property.

The entire EXC ACE 3 property will enter into ICP due to the ICP boundary established for the area and, as a result, the government of Saskatchewan will exercise administrative controls over the site. No monitoring or maintenance requirements have been identified for the property.

3.7 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 and maintenance and for 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.

Five Beaverlodge properties are currently in the ICP and, 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 19 properties with the 5 properties already 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, 2039, 2049, 2059, 2069, 2079, 2094 and every 25 years thereafter. The 2018 net present value of the contribution for the monitoring and maintenance of the 19 properties (or portions thereof) in the ICP is C\$176,206. Prior to entering into the ICP, SMER will require that Cameco review and update the cost estimate to ensure that the 2019 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 at an estimated replacement cost of C\$117,064. 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.

3.8 Environmental Protection Review under the NSCA

CNSC staff performed an Environmental Protection Review (EPR) under the NSCA as this licence amendment is not a designated project under the *Canadian Environmental Assessment Act, 2012*.

In accordance with section 11 of the *General Nuclear Safety and Control Regulations*, 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 *General Nuclear Safety and Control Regulations* 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, or
- 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 it can be concluded that these properties do not currently pose an unreasonable risk to the environment or the health and safety of persons.

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 19 properties, or portions therein, 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. One property poses no risk to the environment or public and meets clearance levels, and therefore is not proposed for transfer to the ICP.

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

The government of Saskatchewan's ICP was established in accordance with Canada's international obligations.

CNSC staff conclude 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.

3.9 Existing Beaverlodge 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* [31]. The CNSC accepted that the information fulfills the requirement of condition 10.1 (maintenance of a financial guarantee) within Waste Facility Operating Licence, WFOL-W5-2120.0/2013.

The request to release 20 properties from the Beaverlodge Project Waste Facility Operating Licence will not impact the existing financial guarantee arrangement for the remaining properties.

3.10 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 five 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 [30]. 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 percent 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 over the five year study period.

3.11 Public Information and Disclosure

3.11.1 Discussion

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.

Cameco has a robust public information program for the Beaverlodge project. The licensee has undertaken numerous activities and effort to continuously improve and maintain communication with those interested in and concerned about the Beaverlodge site.

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. CNSC staff assessed and confirmed Cameco's efforts in developing and sustaining effective public information programs that inform and engage the citizens of northern Saskatchewan.

3.12 Indigenous Consultation

The common law duty to consult with Indigenous groups 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 groups who have an interest in CNSC regulated facilities and activities. In support of the request for release of 20 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.

3.12.1 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 First Nation, Hatchet Lake First Nation, and Fond du Lac First Nation);
- Black Lake First Nation;
- Hatchet Lake First Nation;
- Fond du Lac First Nation;
- Athabasca Chipewyan First Nation;
- Clearwater River Dene Nation;
- Prince Albert Grand Council; and
- Métis Nation Saskatchewan - Northern Region 1.

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 sent letters of notification in April 2019 to the identified groups above, providing information regarding the proposed release of licensed properties and 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 to the identified groups were conducted to ensure they had received the letters and to answer any questions. To date, no issues related to potential impacts on Indigenous and/or treaty rights as a result of the release of Beaverlodge properties have been raised by the identified First Nation and Métis groups.

CNSC REGDOC-3.2.2, *Aboriginal Engagement*, published in February 2016, 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 Cameo's request to release 20 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 communities informed of the transfer of properties to institutional control and any on-going activities of interest to the communities.

3.12.2 Conclusion

Based on the information received and reviewed, this licence amendment application will not cause adverse impacts to any potential or established Indigenous and/or treaty rights. Therefore, CNSC staff determined that the decision before the Commission does not raise the duty to consult. However, the identified First Nation and Métis groups have been notified and encouraged to participate in the process and in the Commission's public hearing to advise the Commission directly of any concerns they may have in relation to this request.

3.13 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 participated in information sessions in the Northern Settlement of Uranium City. An information session was provided to over 15 participants on May 29, 2018 and another session on June 4, 2019 to approximately 40 participants. Attendees included representatives from Northern Saskatchewan Environmental Quality Committee (EQC). These sessions provided information on the proposed transfer of properties at the Beaverlodge site to provincial institutional control. Presentations were made by Cameco, SMER, SMOE as well as the CNSC. The CNSC presentation provided an overview of the CNSC and the agencies' role in the transfer process. CNSC regularly attend committee meetings in Uranium City to answer any questions that may arise.

3.13.1 Discussion

Through CNSC's Participant Funding Program (PFP), up to C\$50,000 was made available to assist members of the public, Indigenous groups, and stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review Cameco's request and associated documents and to prepare for and participate in the Commission's public hearing.

The deadline for applications was May 24, 2019. A Funding Review Committee (FRC), independent from CNSC staff, reviewed the funding 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 3.2.

Table 3.2: PFP funding awarded

Applicant	Maximum funding award
Ya'thi Néné Land and Resource Office	\$25,300
Saskatchewan Environmental Society	\$5,175
Athabasca Chipewyan First Nation	\$19,525
TOTAL	\$50,000

3.13.2 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 groups, and other stakeholders, through the PFP, to prepare for and participate in the Commission's public hearing.

3.14 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. At the time, the planned timeline for requests for transfer to the ICP ranged from 2015 to 2023 (the expiry of the current CNSC 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 ICP between 2015 and 2017 are now included in this request. Also, rather than a staged request for the remaining 45 properties, Cameco decided to request the transfer of 17 properties in 2022 and the remaining 28 properties in 2023.

Annex B of this CMD contains a table titled *Cameco's Institutional Control Transfer Timeline* which provides an updated property by property timeline estimates for institutional control transfer eligibility. Each column in the table represents when Cameco believes that the performance indicators described in section 3 will be met. When all performance indicators are met, the properties will be considered safe, secure, and stable/improving and the performance objectives and regulatory acceptance criteria for the site will be satisfied.

CNSC staff and the government of Saskatchewan have reviewed Cameco's institutional control transfer timeline and found that it is an acceptable plan for transferring the properties into the ICP. Cameco indicated that all properties should be eligible for transfer into the ICP during the current licence term of 10 years.

4 OVERALL CONCLUSIONS AND RECOMMENDATIONS

4.1 Overall Conclusions

Cameco submitted a request to have 20 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 agree that the applicable indicators and criteria have been achieved for these 20 properties.

As CNSC staff have completed their technical review 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 is required for the province before properties can be transferred into the ICP.

CNSC staff recommend that the Commission:

- approve the amended Beaverlodge licence with the 20 properties removed; and
- exempt the government of Saskatchewan under section 7 of the NSCA, in order to allow 19 properties to enter into the ICP.

An Environmental Protection Review under the NSCA was conducted for this application and incorporated into section 3.8 of this CMD. CNSC staff conclude 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.

4.2 Overall Recommendations

CNSC staff recommend the Commission:

- amend Waste Facility Operating Licence WFOL-W5-2120.0/2023 to remove 20 properties from the figure within Appendix A;
- exempt the government of Saskatchewan from licensing under the NSCA for the 19 properties, or portions therein, proposed for transfer into Saskatchewan's Institutional Control Program; and
- accept amended Waste Facility Operating Licence WFOL-W5-2120.1/2023, which has been updated to the current CNSC standard licence format.

The properties to be exempted to enable transfer to ICP and/or released from licensing are described in table 1.1 (section 1.5). Figure 1.2 shows the 19 properties which will require an exemption for the government of Saskatchewan from CNSC licensing and the one property which can be released from CNSC licensing without also being subject of exemption and transfer to the ICP.

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 Proceeding, 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 (e-Doc 4141476).
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 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).
5. *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, International Atomic Energy Agency, June 2001.
6. *Nuclear Substances and Radiation Devices Regulations*, 2000.
7. 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).
8. Final Closure Report – Addendum 1, 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, Cameco Corporation, August 2016 (e-Doc 5058744).
9. Final Closure Report – Addendum 2, 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, Cameco Corporation, November 2016 (e-Doc 5119033).
10. Final Closure Report, Beaverlodge Properties URA 3, URA 5, EXC URA 5, ACE 5, JO-NES, and HAB 2A, Kingsmere Resource Services Inc., March 2018 (e-Doc 5501321).
11. Letter to M. Leblanc (CNSC) from L. Mooney (Cameco) *re: Hearing Request for Release of 20 Properties from Licensing*, February 19, 2019. Email from K. Nagy (Cameco), to R. Snider (CNSC) *Re: Clarification that Cameco Requests a Licence Amendment*, February 20, 2019 (e-doc 5802791).
12. *The Reclaimed Industrial Sites Regulations*. Chapter R-4.21 Reg. 1, effective March 21, 2007 and as amended by Saskatchewan Regulation 109/2010 and 80/2018.

13. Letter to M. Webster (Cameco) from D. Kristoff (SMOE), *re: Release from Decommissioning and Reclamation for 14 Beaverlodge Properties*, February 9, 2017 (e-Doc 5740257).
14. Letter to M. Webster (Cameco) from G. Bihun (SMOE), *re: Clarification on Release from Decommissioning and Reclamation for 14 Beaverlodge Properties* January 29, 2019. (e-Doc 5779351).
15. Letter to M. Webster (Cameco) from G. Bihun (SMOE), *re: Letter of Intent to Release Beaverlodge Properties URA 3, URA5, EXC URA 5, ACE-5, JO-NES, and HAB 2A from Decommissioning and Reclamation Requirements*, April 5, 2019 (e-Doc 5871212).
16. *The Mineral Industry Environmental Protection Regulations, 1996*, Chapter E-10.2 Reg 7 (effective March 6, 1996).
17. Letter to R. Snider (CNSC) from D. Zmetana (SMER), *re: Letter of Intent to Accept Beaverlodge Properties into the Institutional Control Program*, June 25 2019 (e-Doc 5934345).
18. *General Nuclear Safety and Control Regulations*, 2000.
19. Surficial Gamma Radiation Survey of Disturbed Areas at the Former Beaverlodge Mine Site, ARCADIS SENES Canada Inc., November 2014 (e-Doc 4588292).
20. Beaverlodge Site Gamma Radiation Risk Evaluation, ARCADIS SENES Canada Inc., June 2015 (4798829).
21. Beaverlodge Property – Crown Pillar Assessment (2014-2015), SRK Consulting (Canada) Inc., July 2015 (e-Doc 4814188).
22. Decommissioned Beaverlodge Mine Site Environmental Performance Report, Canada North Environmental Services. October 2019 (e-Doc 5688582).
23. Northern Mine Decommissioning and Reclamation Guidelines, EPB 381, Ministry of Environment, November 2008.
24. Pit Slope Stability Inspection Report, SRK Consulting (Canada) Inc., December 2010 (e-Doc 3668048).
25. Record of Proceedings, Including Reasons for Decision In the Matter of Cameco Corporation Application to Renew the Beaverlodge Mine and Mill Site Waste Facility Operating Licence and to Exempt Five Decommissioned Sites, Hearing Date February 18, 2009 (e-Doc 3350132).
26. Geotechnical Report, Stability and Hazard Assessment, Satellite Mine Open Pits, Beaverlodge, Saskatchewan, Clifton Associates Ltd., September 2000 (e-Doc 949001).
27. Saskatchewan Environmental Quality Guidelines (<https://envrbrportal.crmf.saskatchewan.ca/seqg-search/>).
28. Waste Rock Stability assessments Former Eldorado Beaverlodge Sites, SRK Consulting (Canada) Inc., December 2010 (e-Doc 3668058).

29. 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.
30. 2014 Uranium City Consultation on Land Use, SENES Consultants & Kingsmere Resources Services, January 2015 (e-Doc 4714309).
31. Letter to Richard Ferch (CNSC) from Robert Phillips (Cameco), Beaverlodge Project: Financial Assurance for Cameco Corporation, Beaverlodge Decommissioned Mine and Mill Site, Northern Saskatchewan, June 9, 2005 (e-Doc 1260110).

GLOSSARY/ABBREVIATIONS

Abbreviations

ALARA	As low as reasonably achievable
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
EPR	Environmental Protection Review
EQC	Environmental Quality Committee
FRC	Funding Review Committee
JRG	Joint Regulatory Group
ICMMF	Institutional Control Monitoring and Maintenance Fund
ICP	Institutional Control Program
ICUEF	Institutional Control Unforeseen Events Fund
NSCA	<i>Nuclear Safety and Control Act</i>
NSRDR	<i>Nuclear Substances and Radiation Devices Regulations</i>
PFP	Participant Funding Program
QSM	Quantitative Site Model
SRK	SRK Consulting
SMER	Saskatchewan Ministry of Energy and Resources
SMOE	Saskatchewan Ministry of Environment

Glossary

Adit	An entrance to an underground mine which is horizontal or nearly horizontal
Crown Pillar	The rock mass above the uppermost mine working and the ground surface
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

A. BASIS FOR THE RECOMMENDATIONS(S)

A.1 Regulatory Basis

The regulatory basis for the recommendations presented in this CMD is 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:

- *Waste Management, Volume II: Assessing the Long-Term Safety of Radioactive Waste Management (REGDOC-2.11.1, Volume II)*, Canadian Nuclear Safety Commission, May 2018.
- *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 INSTITUTIONAL CONTROL TRANSFER TIMELINE

Property Information		Planned Timelines (2019) 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	
Hab								
HAB 1	19.9	Complete	Complete	Complete	n/a	Complete	Monitor AN-5 through 2022	2023
EXC 1	3.9	Complete	Complete	2019-20	Complete	Complete	Monitor AN-5 through 2022	2023
HAB 2	8.3	Complete	n/a	Complete	Complete	Complete	Monitor AN-5 through 2022	2023
Dubyna								
EMAR 1	10.1	Complete	Complete	n/a	n/a	Complete	Monitor DB-6 through 2022	2023
Verna/Bolger								
BOLGER 1	11.5	Complete	Complete	n/a	n/a	Complete	Monitor AC-6A through 2022	2023
NW 3 Extension	0.5	Complete	n/a	2019-20	n/a	Complete	n/a	2022
NW 3	19.6	Complete	n/a	Complete	Complete	Complete	n/a	2022
ACE 7	3.5	Complete	n/a	n/a	n/a	Complete	n/a	2022
ACE 8	23.2	Complete	n/a	Complete	n/a	Complete	n/a	2022
Lower Ace Creek								
ACE MC	14.5	Complete	Complete	2019-20	Complete	Complete	n/a	2022
ACE 1	19.5	Complete	n/a	2019-20	Complete	Complete	n/a	2022
URA FR	6.3	Complete	Complete	n/a	n/a	Complete	Monitor AC-14 through 2022	2022
URA 1	17.5	Complete	Complete	n/a	Complete	Complete	Monitor AC-14 through 2022	2022
URA 4	21.2	Complete	n/a	2019-20	Complete	Complete	n/a	2022
URA 7	20.9	Complete	n/a	2019-20	Complete	Complete	Monitor AC-14 through 2022	2022
ACE 3	20.9	Complete	n/a	Complete	n/a	Complete	n/a	2022
ACE 9	34	Complete	n/a	n/a	n/a	Complete	n/a	2022
ACE 14	20.9	Complete	n/a	n/a	n/a	Complete	n/a	2022
EXC URA 7	10.1	Complete	n/a	n/a	n/a	Complete	Monitor AC-14 through 2022	2022
Tailings Management Area								
EXC URA 6	6	Complete	n/a	n/a	n/a	Complete	Monitoring TL-7 through 2022	2022
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 15	2	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2022
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 2	20.4	Complete	n/a	n/a	n/a	Complete	Monitoring TL-4 through 2022	2022
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

PART TWO

The second part of this CMD provides information pertaining directly to the licence, including:

1. The current waste facility operating licence WFOL-W5-2120.0/2023
2. Proposed licence changes
3. The proposed waste facility operating licence WFOL-W5-2120.1/2023
4. The draft Licence Conditions Handbook

CURRENT LICENCE

e-Doc 4069368 (PDF)



LICENCE

Directorate of Nuclear Cycle
and Facilities Regulation

Our file Notre référence

2.05

WASTE FACILITY OPERATING LICENCE CAMECO CORPORATION BEAVERLODGE

I) LICENCE NUMBER: WFOL-W5-2120.0/2023

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, SK S7M 1J3**

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

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to possess, manage, and store, the nuclear substances that are 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:

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

- iii) The WFOL-W5-2120.0/2023 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission (CNSC) staff to assess the licensee's compliance with the conditions listed in the licence. The LCH also provides information regarding delegation of authority and applicable version control of documents.

VI) CONDITIONS:

1. GENERAL

- 1.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis.
- 1.2 Changes to the facility, its operation, or safety and control measures described in the application and the documents needed to support that application are permitted provided that the objective of the licensing basis is met.
- 1.3 The licensee shall give written notification to the Commission of any changes made to the documents needed to support the licence application.
- 1.4 The licensee shall, in the event of any conflict or inconsistency between licence conditions or any documents referenced in the LCH, direct the conflict or inconsistency to the Commission, or a person authorized by the Commission, for resolution.
- 1.5 The licensee shall implement and maintain a program for public information for the facility, including a public disclosure protocol.

2. MANAGEMENT SYSTEM

- 2.1 The licensee shall implement and maintain a management system.
- 2.2 The licensee shall ensure that every contractor working at the facility complies with the applicable conditions of this licence including those relating to the licensee's policies, programs, and procedures with respect to the protection of health, safety, and the environment, and to the maintenance of security.

3. OPERATING PERFORMANCE

- 3.1 The licensee shall implement and maintain an operating program.
- 3.2 The licensee shall implement and maintain a process for reporting to the Commission or a person authorized by the Commission that includes reporting of all events required by the *Nuclear Safety and Control Act* and its Regulations.

4. SAFETY ANALYSIS

4.1 The licensee shall implement and maintain a safety analysis program.

5. PHYSICAL DESIGN

5.1 The licensee shall implement and maintain a design program.

6. RADIATION PROTECTION

6.1 The licensee shall implement and maintain a radiation protection program.

7. CONVENTIONAL HEALTH AND SAFETY

7.1 The licensee shall implement and maintain an occupational health and safety program.

8. ENVIRONMENTAL PROTECTION

8.1 The licensee shall implement and maintain an environmental protection program.

9. EMERGENCY MANAGEMENT AND FIRE PROTECTION

9.1 The licensee shall implement and maintain an emergency management program.

10. WASTE MANAGEMENT

10.1 The licensee shall maintain a financial guarantee for long-term monitoring and maintenance of the facility that is acceptable to the Commission.

11. SAFEGUARDS AND NON-PROLIFERATION PROGRAM

11.1 The licensee shall implement and maintain a safeguards and non-proliferation program.

SIGNED at OTTAWA, this 27 day of May, 2013.

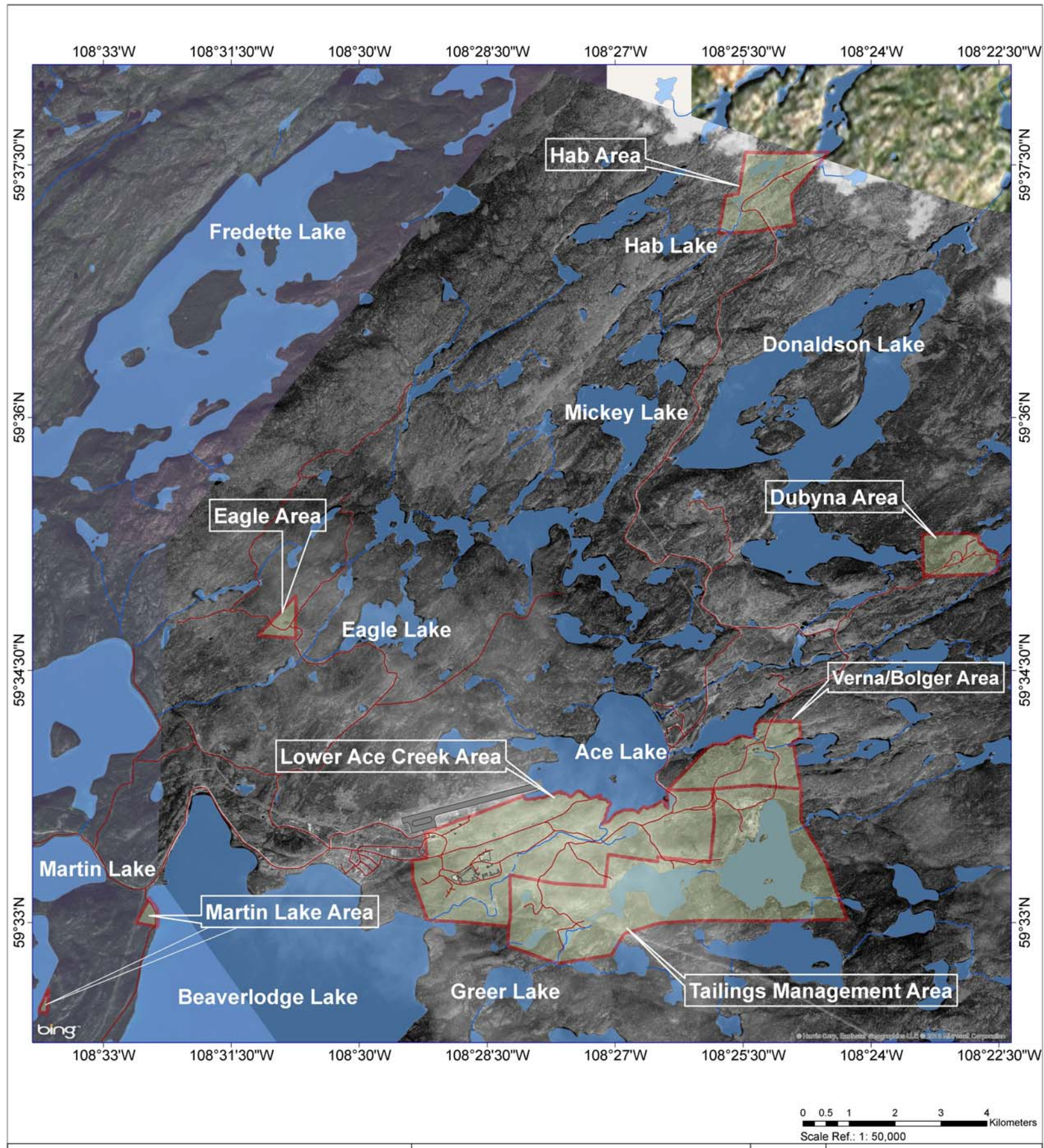


Michael Binder, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

**LOCATION OF THE DECOMMISSIONED
BEAVERLODGE MINE AND MILL SITE**

The location of the decommissioned Beaverlodge mine and mill site is shown on Figure 1-1: Location of the Decommissioned Beaverlodge Mine and Mill Site (E-DOC 4081734).



Location of the Decommissioned Beaverlodge Mine and Mill Site

Legend	
Rivers	Area Boundaries
Roads	Licensed Areas
Water Bodies	

<p>Map No. 1-1</p>	<p>Cameco Corporation</p>
	<p>Drawn by: B.Yee</p>
	<p>Coordinate: WGS84 UTM 12N</p>
<p>Date: Jan. 2013</p>	

Proposed Licence Changes

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 (LCH)s. 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.

The “General” conditions in the proposed licence maintain existing regulatory requirements from the current licence:

- G.1 Licensing Basis for Licensed Activities (previously General 1.1 and 1.2)
- G.2 Notification of Changes (previously General 1.3 and Operating Performance 3.2)
- G.3 Financial Guarantee (previously Waste Management 10.1)
- G.4 Public Information and Disclosure (previously by reference in General 1.5).

The proposed licence retains the safety and control areas from the current licence, with the exception of waste management. There were no conditions under waste management, other than the requirement to maintain a financial guarantee. As this requirement is now in condition G.3 the safety and control area is no longer needed within the licence. The licence has nine conditions related to the safety and control areas which remain relevant at the post-decommissioned site:

- 1.1 Management System (previously 2.1 and 2.2)
- 2.1 Operating Performance (previously 3.1)
- 2.2 Operating Performance (previously 3.2)
- 3.1 Safety Analysis (previously 4.1)
- 4.1 Physical Design (previously 5.1)
- 5.1 Radiation Protection (previously 6.1)
- 6.1 Conventional Health and Safety (previously 7.1)
- 7.1 Environmental Protection (previously 8.1).
- 8.1 Emergency Management and Fire Protection (previously 10.1)
- 9.1 Safeguards and Non-Proliferation (previously 11.1).

The remaining four SCAs are not applicable to the post-decommissioning management of the site, or are very low risk considerations that can be managed under the broad umbrella of the existing SCAs.

Licence Period

There are no changes to the licence period.

Appendix A

It is proposed that Figure 1 be updated to remove 20 properties proposed for release.

PROPOSED LICENCE

e-Doc 5952771 (PDF)



**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 **October 2, 2019** 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 _____ day of _____, 2019.

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

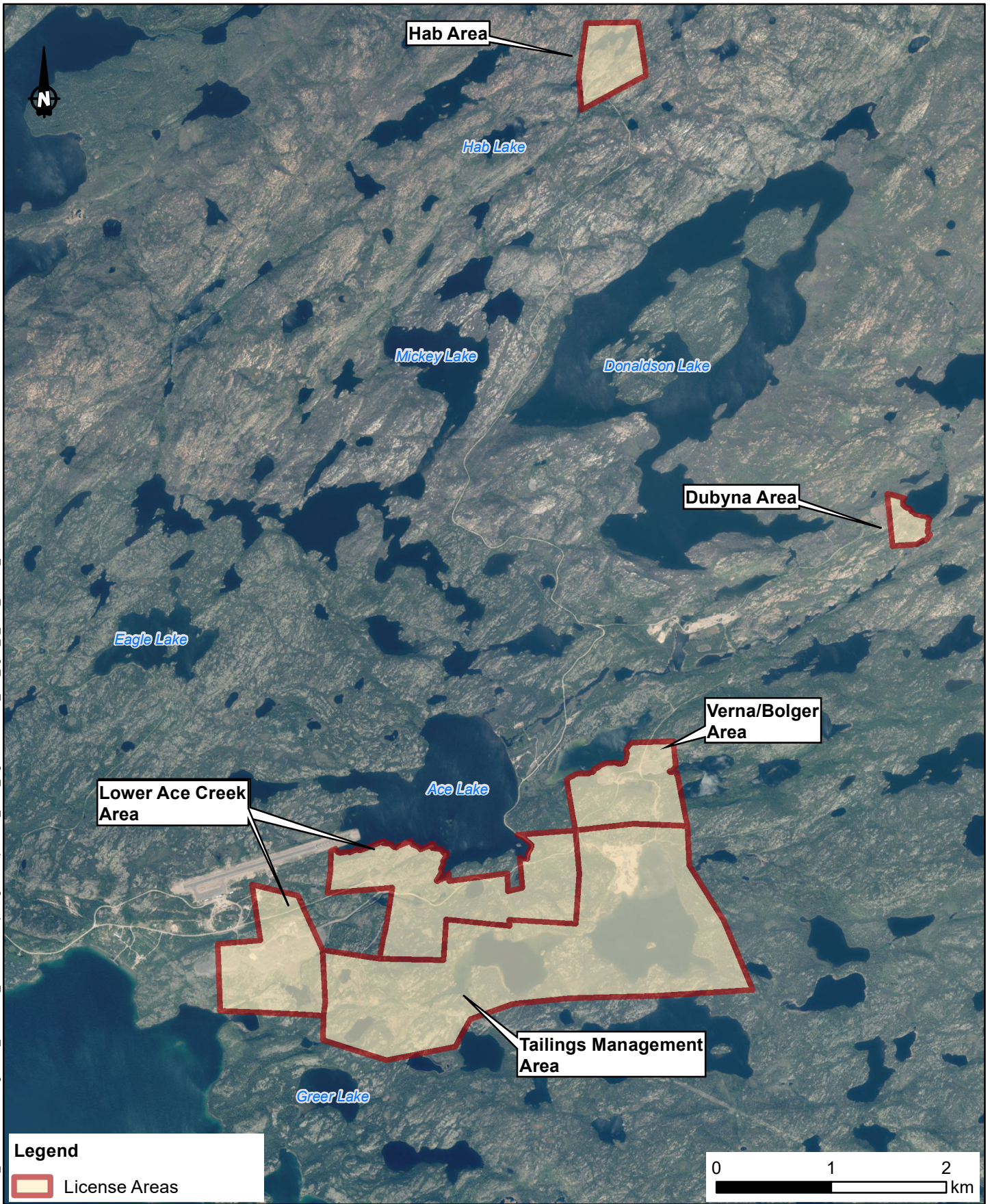
APPENDIX A

LOCATION OF THE DECOMMISSIONED BEAVERLODGE MINE AND MILL SITE

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

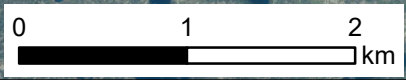
DRAFT

Path: \\srk.adf\dfs\matssk\Projects\01_SITES\Beaverlodge\020_Site-Wide_Data\GIS\Maps\Figure Maps\2019_CMD_Figures\1CC007_054_fig00_0_cnsc_license_areas.mxd



Legend

 License Areas





Job No: 1CC007.054

Filename: 1CC007_054_fig00_0_cnsc_license_areas



CAMECO CORPORATION

Beaverlodge Hearing 2019

Location of the Decommissioned Beaverlodge Mine and Mill Site

Date:	Approved:	Figure:
Apr 2019		1

DRAFT LICENCE CONDITIONS HANDBOOK

e-Doc 4069351 (PDF)



DRAFT

e-Doc 5913955 (Word)
e-Doc 4069351 (PDF)

LICENCE CONDITIONS HANDBOOK

LCH-WFOL-BVL.01/2023

BEAVERLODGE WASTE FACILITY OPERATING LICENCE

WFOL-W5-2120.1/2023

Revision 1



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**Licence Conditions Handbook
Beaverlodge Project
Waste Facility Operating Licence
WFOL-W5-2120.01/2023**

Effective: December XX, 2019

SIGNED at OTTAWA this XX day of December 2019

**Peter Fundarek, 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)
December XX, 2019	1	All	Licence and LCH modernization which includes new standard licence conditions and updated LCH text and format.	5913955 (Word) 4069351 (PDF)

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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 typically 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

INTRODUCTION

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 G1 requires activities (defined in Section IV of the Licence) be conducted in accordance with the licensing basis. Information on the licensing basis, in addition to the definition provided in G1, is discussed in CNSC’s 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. 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. Further information on the licensing basis can be found in INFO-0795 *Licensing Basis Objective and Definition*.

Part (i) of the licensing basis includes, but is not limited to, the following:

- *Nuclear Safety and Control Act*
- *Uranium Mines and Mills Regulations*
- *Radiation Protection Regulations*
- *Packaging and Transport of Nuclear Substances Regulations, 2015*
- *Nuclear Substances and Radiation Devices Regulations*
- *Canadian Environmental Assessment Act, 2012*
- Canada/International Atomic Energy Agency (IAEA) Safeguards Agreement

GENERAL

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 REGDOCs, CSA Group standards or licensee documentation submitted in support of a licence.

Authorized activities at the decommissioned Beaverlodge mine and mill site to which CNSC staff provide oversight include:

- maintenance activities associated with the decommissioned facilities
- environmental monitoring
- implementation of the remedial options identified in the Path Forward Report.

Compliance Verification Criteria

Licensing Basis Documents

Licensing basis documents are listed in Appendix B 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 perceived or real conflict or 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 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 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 in a document separate from the LCH, e-Doc XXXXXXXX.

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 a notification of change. 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 of how the licensee has concluded that the change remains in accordance with the licensing basis

Ongoing regular communication shall be maintained to support a no surprise approach 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).

GENERAL

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 all costs of implementing the proposed decommissioning plan and 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

DRAFT

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

* Document under review and expected to be ready for review prior to signing of the LCH

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	4062387	Yes

Guidance

There is no guidance provided for this licence condition.

GENERAL

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.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management system requirements for nuclear facilities	N286-12
CNSC	Management System*	REGDOC-2.1.1

* Document under review and expected to be ready for review prior to signing of the LCH

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 are no recommendations or guidance.

MANAGEMENT SYSTEM

2 OPERATING PERFORMANCE

Licence Condition 2.1

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

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

Licence 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	Environmental Monitoring Program	4107431	Yes

Construction, commissioning and 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.

OPERATING PERFORMANCE

- 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 Substance 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, January 2018*	REGDOC-3.1.2

* Document under review and expected to be ready for review prior to signing of the LCH

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

Licence Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	3942669	Yes
Cameco	Quantitative Site Model	3956318	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 Modeling 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.

SAFETY ANALYSIS

4. PHYSICAL DESIGN

Licence Condition 4.1

The licensee shall implement and maintain a physical 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

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

The design program will be evaluated against the following principles:

- 4.1.1 The design process is planned, documented and controlled.
- 4.1.2 The design control process is defined and communicated and is understood by affected personnel.
- 4.1.3 A design authority responsible for the design control process is designated.
- 4.1.4 The design control process includes design planning, inputs, output, review, verification, validation, transfer, records and change management.

PHYSICAL DESIGN

- 4.1.5 Design inputs are established and include such items as:
- functional requirements
 - performance and operational requirements
 - environmental, health and safety and human factors considerations
 - applicable codes and standards
- 4.1.6 The design is reviewed by considering design inputs, requirements, experience with similar designs, and the results of research and testing.
- 4.1.7 Design documents are maintained so the design can be related to the design requirements and used by organizations responsible for construction, commissioning, operation, and decommissioning. The following are included in the design documents:
- design requirements
 - inputs, assumptions, methods, modeling, test and development work, and results
 - purchasing, installation and construction requirements
 - design drawings
 - characteristics of the design that need to be confirmed during commissioning
 - system or equipment operating and maintenance requirements
- 4.1.8 The facility design and status documents are accurate and accessible to facility personnel.
- 4.1.9 Operational specifications and restrictions imposed by the design, including risk analyses, are appropriately communicated to the operators and incorporated into operating programs, procedures, practices, and training.
- 4.1.10 Procedures have been implemented to ensure that design output information (document and/or data) appropriately and accurately reflect the approved design.
- 4.1.11 The facility's as-built physical configuration reflects the approved design.

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” (RP) 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), and 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. 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

Licence Documents that Require Notification of Change

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

The 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.

RADIATION PROTECTION

- 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 as low as reasonably achievable in accordance with ALARA principles.
- 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 Human Resources and Skills Development Canada (HRSDC). 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	Notification Requirements
Cameco	Facility Licensing Manual	3942669	Yes

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

- 6.1.1 The necessary people, materials, equipment, programs and procedures to effectively manage, control and minimize health and safety risks have been provided.
- 6.1.2 Housekeeping standards have been identified and are enforced to ensure that work areas are kept clean and organized.
- 6.1.3 Facilities, processes and procedures have been implemented to ensure the safe management of hazardous materials.
- 6.1.4 Employees and contractors actively participate in the management of conventional health and safety.
- 6.1.5 Management verifies that employees and contractors actively participate in the management of health and safety in their workplace.

CONVENTIONAL HEALTH AND SAFETY

- 6.1.6 Procedures have been established and are maintained to communicate information about conventional health and safety.
- 6.1.7 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.
- 6.1.8 Routine inspections are performed by workers, supervisors, senior staff and/or safety professionals to identify any potential safety issues.
- 6.1.9 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.
- 6.1.10 Procedures have been implemented and maintained for reporting work-related injuries, illnesses, fatalities and conventional health and safety incidents including near misses.
- 6.1.11 The causes of injuries are investigated, corrective actions implemented, and the effectiveness of corrective actions verified.
- 6.1.12 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

* Document under review and expected to be ready for review prior to signing of the LCH

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	Water Sampling Program	3682722	Yes
Cameco	Cameco Beaverlodge Mine Site Path Forward Report	4052116	Yes
Cameco	Quantitative Site Model	3956318	Yes
Cameco	Environmental Monitoring Program	4107431	Yes
Cameco	Environmental Risk Assessment	5688582	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	REGDOC-2.10.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Facility Licensing Manual	2942669	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 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	3952669	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 CEEA, 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 onsite 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.

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	Notification Requirements
Facility Licensing Manual	3942669	PN
Quality Management Program	4091997	PN
Water Sampling Program	3682722	PN
Environmental Monitoring Program	4107431	PN
Property Description Manual	4459861	PN
Public Information Program	4062387	PN
Quantitative Site Model	3956318	PN
Cameco Beaverlodge Mine Site Path Forward Report	4052116	PN
Environmental Risk Assessment	5688582	PN
Financial Assurance for Cameco Corporation, Beaverlodge Decommissioned Mine and Mill Site, Northern Saskatchewan	1260110	PN

PN = Prior Notification

APPENDIX B

APPENDIX C LIST OF DOCUMENTS USED AS GUIDANCE OR CRITERIA

Document	Document Title	Document Number
CNSC	Change Control Process	19-318-07
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	Management System*	REGDOC-2.1.1
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures	REGDOC-2.9.1 version 1.1
CNSC	Nuclear Emergency Preparedness and Response	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, January 2018	REGDOC-3.1.2
CNSC	Public Information and Disclosure (implementation, 2013)	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

* Document under review and expected to be ready for review prior to signing of the LCH

APPENDIX C