Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

UNPROTECTED/NON PROTÉGÉ

ORIGINAL/ORIGINAL

CMD: 20-H108

Date signed/Signé le : 19 AUGUST 2020

Reference CMD(s)/CMD(s) de référence : 13-H5

A Licence Amendment

Cameco Corporation

Cigar Lake Operation

Financial Guarantee Review and Licence Modernization Amendments

Hearing in writing based solely on written submissions

Scheduled for:

October 2020

Submitted by:

CNSC Staff

Une modification de permis

Cameco Corporation

Établissement de Cigar Lake

Examen de la garantie financière et modifications aux fins de modernisation du permis

Audience fondée uniquement sur des mémoires

Prévue pour :

Octobre 2020

Soumise par :

Le personnel de la CCSN

e-Doc 6269597 (WORD)
e-Doc 6328228 (PDF)

Summary

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

- the revision of Cameco Corporation's financial guarantee for the Cigar Lake uranium mine;
- the amendment of the CNSC licence issued to Cameco Corporation's Cigar Lake uranium mine (UML-MINE-CIGAR.00/2021) to include standard licence conditions.

CNSC staff recommend that the Commission take the following actions:

- Accept the proposed revised amount of the financial guarantee for the Cigar Lake Operation.
- Issue the proposed uranium mine licence (UML-MINE-CIGAR.01/2021) in order to conform to a standardized licence format.
- Direct Cameco Corporation to submit to the Commission, within 90 days of the publication of a decision, revised financial instruments.

The following items are attached:

- Current licence UML-MINE-CIGAR.00/2021
- Proposed amended licence UML-MINE-CIGAR.01/2021
- Current Licence Conditions Handbook, Revision 0
- Draft Licence Conditions Handbook, Revision 1

Résumé

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

- La révision de la garantie financière de la société Cameco pour la mine d'uranium de Cigar Lake.
- La modification du permis de la CCSN délivré à la société Cameco pour sa mine d'uranium de Cigar Lake (UML-MINE-CIGAR.00/2021) afin d'y inclure des conditions de permis normalisées.

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

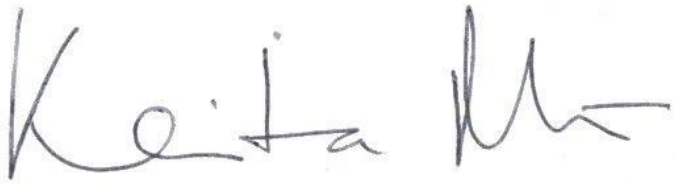
- Accepter le montant révisé proposé de la garantie financière pour l'établissement minier de Cigar Lake.
- Délivrer le permis d'exploitation d'une mine d'uranium (UML-MINE-CIGAR.01/2021) afin de se conformer à un format de permis normalisé.
- Demander à la société Cameco de présenter à la Commission, dans les 90 jours suivant la publication de la décision, des instruments financiers révisés.

Les pièces suivantes sont jointes :

- Le permis actuel, UML-MINE-CIGAR.00/2021
- Le permis modifié proposé, UML-MINE-CIGAR.01/2021
- Le Manuel des conditions de permis actuel, révision 0
- L'ébauche du Manuel des conditions de permis, révision 1

Signed/signé le

19 August 2020



Kavita Murthy

Director General

Directorate of Nuclear Cycle and Facilities Regulation

Directrice général de la

Direction de la réglementation du cycle et des installations nucléaires

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EXECUTIVE SUMMARY

In accordance with section 24 (5) of the *Nuclear Safety and Control Act*, a licence may contain a condition that the licensee provide a financial guarantee in a form acceptable to the Commission.

Accordingly, licence condition 12.3 of the current Canadian Nuclear Safety Commission (CNSC) licence issued to Cameco Corporation's Cigar Lake Operation (UML-MINE-CIGAR.00/2021) requires the licensee to maintain a financial guarantee for decommissioning that is acceptable to the Commission. The financial guarantee must be reviewed and updated every five years, or when there are material changes to operational activities.

To fulfill the requirement of updating the financial guarantee every five years, Cameco Corporation (Cameco) submitted a request to the Canadian Nuclear Safety Commission (CNSC) [1]. A preliminary request, submitted in August 2017, was updated in response to CNSC comments and was finalized on June 12, 2019. This request included a proposed revision to the value of Cameco's financial guarantee from C$49.2 million to C$61.79 million based on the updated Preliminary Decommissioning Plan, a revised cost estimate, and the "decommissioning tomorrow" principle. This change in the financial guarantee triggers an amendment to Cameco's licence (UML-MINE-CIGAR.00/2021), which will be updated to the modern licence conditions and licence conditions handbook (LCH) format.

As part of this request, Cameco submitted its Preliminary Decommissioning Plan and Preliminary Decommissioning Cost Estimate [1]. Following the review, both the Saskatchewan Ministry of Environment and CNSC staff concluded that the Preliminary Decommissioning Plan and the Preliminary Decommissioning Cost Estimate were credible for future decommissioning of the Cigar Lake Operation. Based on CNSC staff review and assessment of Cameco's submitted information, CNSC staff recommend that the Commission:

- accept the proposed revised value of Cameco Corporation's financial guarantee for the Cigar Lake Operation;
- amend the CNSC licence issued to Cameco Corporation's Cigar Lake uranium mine (UML-MINE-CIGAR.00/2021) in order to conform to a standardized licence format; and
- direct Cameco Corporation to submit to the Commission, within 90 days of the publication of a decision, revised financial instruments that are acceptable to the Commission.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality and proprietary considerations.

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

PART ONE

Part One includes:

1. An overview of the matter being presented.
2. General discussion pertaining to the matters for consideration that are relevant to this submission.
3. Discussion about other matters of regulatory interest.
4. Overall conclusions and recommendations.
5. Appendices A and B.

PART TWO

Part Two provides information pertaining directly to the current and proposed licence.

PART ONE

1. OVERVIEW

1.1 Background

Operated by Cameco Corporation (Cameco), the Cigar Lake Operation (CLO) is located approximately 660 kilometres north of Saskatoon, Saskatchewan (figure 1). The villages of Wollaston Lake and Hatchet Lake First Nations, the closest permanent communities, are about 80 kilometres away.

Figure 1: Cigar Lake Operation – location map

Facilities and infrastructure at the CLO include an underground mine, freezing plants and associated freeze pads, ore processing and load out, water treatment, mine rock storage pads, temporary waste storage, workers camp, office and administrative buildings.

High-grade ore from Cigar Lake is transported by truck about 70 kilometres to Orano Canada Inc.'s McClean Lake Operation for processing into yellowcake. All tailings derived from the processing of Cigar Lake ore are placed into the JEB

in-pit tailings management facility at McClean Lake. Problematic waste rock, which is temporarily stored on impermeable lined pads at Cigar Lake, will be disposed of into a purpose-designed disposal facility at McClean Lake.

Cigar Lake has been an active site for about four decades. Starting in 1981, the mineralization deposit was discovered, the deposit delineated by surface drilling, and an exploration camp and airstrip constructed. From 1987 to 1992, a test underground mine was constructed to evaluate mining methods and to further establish the character of the ore body. Following test-mine work, the site was placed into care-and-maintenance for four years to determine whether or not to commercially mine the deposit, and to submit the Cigar Lake environmental impact statement and its addendum. In 1996, federal and provincial governments granted environmental assessment regulatory approval.

From 1996 to 2000, the licensee conducted further engineering studies and testing of mine-development equipment. Following this period, the facility was once again placed in care-and-maintenance for two years while the licensee assessed and decided to mine the deposit. In 2002, CNSC granted the licensee's application to construct. In preparation for mine construction, improvements to surface infrastructure and initiation of freezing around the ore body began. In 2004, work to commence development of the mine began in earnest for target production date of 2007. However, in the fall of 2006, during underground workings development, an uncontrollable water inflow flooded the mine. In 2008, after sealing the initial inflow, a second event occurred during dewatering delaying construction. Remediation efforts continued, and re-entry to the mine was accomplished in 2010 with the development of mining infrastructure and underground processing circuits constructed to facilitate commercial ore production. In the spring of 2015, commercial ore production started. Currently, the CLO is at a steady state of ore production and unchanging surface footprint.

This application represents the eighth update to the financial guarantee (FG) since 1997. There were no past issues with regard to administration of the program. Following the June 2013 public hearing and pursuant to section 24 of the *Nuclear Safety and Control Act* (NSCA), the Commission renewed the uranium mine licence for Cameco's CLO. The revised Preliminary Decommissioning Plan (PDP) and Preliminary Decommissioning Cost Estimate (PDCE) (2012) [3] was also approved as part of the 2013 licence renewal process. The CLO PDP was valid until 2018. The current CNSC licence issued to the CLO is valid until June 2021. The current FG remains in place, while the review of the updated Preliminary Decommissioning Plan and Preliminary Cost Estimate (PDPCE) took place and until a new FG, acceptable to the Commission, is provided.

The updated financial guarantee is based on the site-specific PDP [1] for the CLO, which outlines the end state of the project and the steps the licensee will take to reach that end state. A revised Cigar Lake PDCE [1] outlines the basis for the value of the financial guarantee and is based on the project end state as described in the PDP. CNSC specialists review and assess the PDP and the PDCE against a CSA Group standard and CNSC regulatory documents (appendix B) which result in a determination on the acceptability of the PDP and credibility of the PDCE [1].

Under The *Mineral Industry Environmental Protection Regulations, 1996*, the Saskatchewan Ministry of Environment (SMOE) requires that mining and milling operations prepare decommissioning plans and financial assurances (equivalent to the term financial guarantee under the NSCA) complementary to CNSC staff's review.

A memorandum of understanding between the CNSC and the province of Saskatchewan on reclamation and financial guarantees guide cooperation between the parties [4]. The memorandum of understanding stipulates that it is not intended to require owners and/or operators of uranium mining and milling facilities in Saskatchewan to provide separate and distinct financial guarantees to satisfy federal and provincial requirements. The SMOE provides conditional acceptance of the financial guarantee until it is approved by the Commission. The SMOE is the owner of the lands and beneficiary of the financial guarantee for all operating and decommissioned uranium mines and mills in Saskatchewan. The CNSC or SMOE can invoke the Commission-approved financial guarantee to ensure decommissioning is carried out under extenuating circumstances such as bankruptcy or a failure of the licensee to meet regulatory requirements.

1.2 Highlights

The following is a summary of the financial guarantee regulatory review:

- Cameco submitted an initial PDP and PDCE on August 23, 2017. Following comments from both CNSC staff and SMOE staff, a revised PDP (2019) and a revised cost estimate for decommissioning (PDCE) was submitted on June 12, 2019 [1].
- CNSC staff reviewed and concluded the revised PDP (2019) and PDCE (2019) met the criteria of CNSC regulatory guides and documents (appendix B) [5].
- SMOE conditionally accepted the updated PDP (2019) and the PDCE (2019) on May 7, 2019 [2].
- As part of the submission of the revised PDP and PDCE, Cameco formally requested the Commission approve the proposed value of the updated financial guarantee for decommissioning the CLO and amend the CNSC licence issued to Cameco's CLO (UML-MINE-CIGAR.00/2021) to a format that includes standard licence conditions.
- Based on CNSC staffs' technical assessment of the information submitted by Cameco, CNSC staff prepared a proposed amended licence, updated licence conditions handbook (LCH) and this CMD, including staff's conclusions and recommendations, for the Commission's consideration.

2. MATTERS FOR CONSIDERATION

2.1 Summary of Preliminary Decommissioning Plan Activities

In accordance with paragraph 3(a)(viii) of the *Uranium Mines and Mills Regulations*, Cameco is required to maintain a plan for decommissioning the CLO. Planning for decommissioning is an ongoing process, taking place throughout each stage of the licensed facility lifecycle. PDPs for operating uranium mines and mills are updated and submitted at a minimum every five years or as a result of material changes to operational activities. PDPs provide the basis for revision of material changes to operational activities and of the cost estimate for decommissioning and establishing the value of the financial guarantee. Cameco is required to develop a Detailed Decommissioning Plan (DDP) following the end of production and prior to beginning decommissioning.

As stated by Cameco in the PDP, the decommissioning objectives for the CLO is that all structures and disturbed areas be reclaimed to an ecological and radiological condition that is as similar as is achievable to the surrounding environment with no requirement for long-term maintenance.

Ultimately, the Cigar Lake mine site will be proposed to be released from the CNSC regulatory control and enter into the Province of Saskatchewan's Institutional Control Program.

Cameco has selected a prompt decommissioning strategy. Following the completion of decommissioning and acceptance into the provincial Institutional Control Program, Cameco is planning for an end-state of the mine site suitable for traditional land use with no access restrictions.

The PDP [1] outlines the following activities for the decommissioning of the CLO:

- Decommissioning Approvals
  - Development of DDP and application for required regulatory approvals.
- Active Decommissioning
  - Stage 1: Cessation of production and safely transitioning the site to an inactive state.
  - Stage 2: Underground waste placement and treatment of water collected from slimes dewatering and the underground workings.
  - Stage 3: Post-placement of waste underground, decommissioning surface infrastructure in accordance with the objectives and criteria described in the DDP.
- Decommissioning Project Management
  - Management of active decommissioning activities.

- Environmental Monitoring
  - Monitoring conducted during all stages of active decommissioning. Monitoring frequency, locations, and parameters are reflective of current requirements.
  - Transitional period monitoring conducted following active decommissioning to confirm the success of decommissioning activities and demonstrate the long-term stability of the property. Monitoring frequency, locations, and parameters reduced as compared to current requirements.

2.2 Preliminary Decommissioning Plan and Preliminary Decommissioning Cost Estimate

In accordance with the requirement to update the financial guarantee every five years, as specified under licence condition 12.3, on August 23, 2017, Cameco submitted to the CNSC and SMOE an updated Preliminary Decommissioning Plan and Preliminary Cost Estimate (PDPCE). CNSC staff and SMOE staff reviewed the submission and provided initial comments. A revised PDPCE (2019) [1] was submitted June 12, 2019. The revised PDPCE (2019) contained no significant modifications or deviations from the design decommissioning conditions outlined in the PDP (2012). The revised PDPCE (2019) [1] supports the increase in the value of financial guarantee, which included planned facilities and activities during the five-year guarantee period.

Cameco estimated the updated amount of the cost estimate for decommissioning the CLO to be C$61.79 million. Currently, Cameco has a valid financial guarantee of C$49.2 million. This is an increase of C$12.59 million from the current financial guarantee.

Changes in the revised PDPCE (2019) [1] included an annual discount rate, corrected for inflation and reflecting the published Government of Canada benchmark bond yields. Experience at other facilities has allowed Cameco to refine some of the costs associated with decommissioning the site. Efficiencies in site decommissioning management, equipment costs, revegetation and contouring costs were compared to the PDPCE (2012) [3]. The proposed value of the revised PDPCE (2019) [1] reflects all major decommissioning activities, including decommissioning of underground workings, surface and underground infrastructure, waste management, project management, regulatory oversight, time and institutional control necessary to decommission the CLO as planned. In the PDPCE (2019), Cameco has applied variable contingences ranging from 10 percent to 20 percent to each line item resulting in a total weighted contingency of approximately 16 percent.

On May 7, 2019, SMOE submitted a letter to Cameco [2] that confirmed the PDP and PDCE met provincial regulatory requirements and are acceptable.

CNSC staff's review [5] concluded the revised PDP and PDCE met the requirements of:

- CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*; and
- CSA Group standard N294-09, *Decommissioning of facilities containing nuclear substances.*

Based on the PDP and PDCE review, CNSC staff conclude that the updated amount of C$61.79 million is adequate for decommissioning the CLO.

2.3 Financial Guarantee

Cameco has proposed to continue using letters of credit (LoC) as financial guarantee instruments. The LoC is an acceptable financial instrument that meets the criteria set in the CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities* (appendix B). The province of Saskatchewan is named beneficiary of the financial guarantee, as specified on the LoC comprising the current financial guarantee. The SMOE and CNSC relationship with regard to the financial guarantee matters is outlined in a memorandum of understanding discussed previously in section 1.1 of this CMD.

Currently, Cameco has a valid financial guarantee of a total C$49.2 million in the form of a LoC. Should the Commission approve the proposed financial guarantee amount of C$61.79 million, Cameco will update the LoC to reflect the accepted amount payable to SMOE. CNSC staff will review the LoC to confirm that the financial guarantee instruments meet CNSC acceptance criteria for liquidity, certainty of value, adequacy of value, and continuity. If approved, the updated LoC will be added to the LCH, as recommended by the Commission in the Record of Decision DEC 20-H101 [7].

2.4 Proposed Licence Standardization

In an effort to promote clarity and consistency of language, the CNSC is in the process of implementing standard licence conditions for all CNSC issued licences and standardized text for the uranium mines and mills LCHs. The implementation of the standardized licence conditions for operating uranium mine and/or mill sites started in 2017 with the McClean Lake Operation licence renewal; this process is continuing with Cameco's operations as part of the financial guarantee updates for all of their mine and/or mill sites. The implementation of the standardized licence conditions for the remaining Cameco sites is expected to be completed in 2020/2021.

The update will not have a material change on daily operations for the CLO. A table summarizing the existing and proposed licence changes along with a copy of the existing licence (UML-MINE-CIGAR.00/2021) and proposed amended licence (UML-MINE-CIGAR.01/2021) are provided in Part Two of this CMD.

In addition to updating the licence, the LCH has also been updated to reflect modern standard licence conditions and guidance. The LCH updates include references to CNSC regulatory documents and CSA documents which were published after the last update of the LCH. These documents include both guidance and compliance verification criteria. CNSC staff advised Cameco of the proposed revisions to the licence and LCH; Cameco concurs with the implementation timelines of the LCH documents.

The draft LCH (Revision 1) is also provided in Part Two of this CMD.

2.5 Environmental Assessment

CNSC staff reviewed Cameco's request under the *Nuclear Safety and Control Act* and have concluded that, given the nature of the proposed licence amendment, there are no impacts to the environment.

2.6 Other Matters of Regulatory Interest

The following table identifies other matters that are relevant to this CMD.

OTHER MATTERS OF REGULATORY INTEREST	
Area	**Relevant to this CMD?**
Indigenous Consultation	No
Other Consultation	No
Ongoing Public Engagement	Yes
Cost Recovery	No
Improvement Plans and Significant Future Activities	No
Licensees' Public Information Program	No
Nuclear Liability Insurance	No

The relevant "other matters" of regulatory interest are discussed in section 3.

2.7 Regulatory and Technical Basis

The regulatory and technical basis for the matters discussed in this CMD are provided in appendix B of this document.

The key requirements come directly from the *Nuclear Safety and Control Act*, *General Nuclear Safety and Control Regulations* and the *Uranium Mines and Mills Regulations* as well as applicable CNSC regulatory documents (REGDOCs) and CSA Group standards.

3. OTHER MATTERS OF REGULATORY INTEREST

3.1 Ongoing Pubic Engagement

As per the CNSC's notification process for Commission proceedings, CNSC staff informed the public via the CNSC's website, email subscription list and social media channels of this Commission hearing. The public have been invited to provide written interventions for the hearing.

Although not specific to this CMD, CNSC conduct ongoing engagement activities to inform the public and Indigenous groups of CNSC regulatory activities. On February 28, 2019, CNSC staff provided information to the Northern Saskatchewan Environmental Quality Committee (EQC) on the review status of all preliminary decommissioning plan submissions from Cameco. CNSC staff provided information on the status of each review as well as how the Commission hearing process would likely proceed [6].

As part of improving CNSC's outreach approach associated with the development and presentation of the annual *Regulatory Oversight Report on Uranium Mines and Mills in Canada: 2018*, CNSC staff met with the EQC on September 4, 2019, and with Indigenous leadership and representatives on September 5, 2019 in Prince Albert, Saskatchewan. CNSC staff presented a summary of the *Regulatory Oversight Report on Uranium Mines and Mills in Canada, 2018*, and answered questions on CNSC-regulated uranium mines and mills, including the CLO.

CNSC staff also presented information at an interactive workshop with representatives from communities that have signed collaboration agreements with Cameco. The June 6, 2018, workshop, conducted in Saskatoon Saskatchewan, was titled *Awareness of the Role of Community Involvement in Decommissioning from the Beginning of Uranium Mining to the End of Uranium Mining*. CNSC staff provided presentations on the *Decommissioning of Licensed Facilities and Financial Guarantees*, an *Overview of the CNSC Regulatory Oversight Report* and *CNSC's Role in the Transfer of Decommissioned Mine and/or Mills Site to Institutional Control*.

CNSC staff regularly attend EQC meetings and licensee outreach sessions to present information and answer questions.

4. OVERALL CONCLUSIONS AND RECOMMENDATIONS

4.1 Overall Conclusions

CNSC staff conclude that:

- Cameco's revised PDP meets the requirements of CSA Group standard N294-09, *Decommissioning of facilities containing nuclear substances* and CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*;
- Cameco's revised PDCE meets the requirements of CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*;

- Cameco's revised PDCE is acceptable to meet the remaining detailed decommissioning activities described within the updated PDP; and
- with respect to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act*, CNSC staff have concluded that the licensee:
  - is qualified to carry on the activities authorized by the licence; and
  - will, in carrying out that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

4.2 Overall Recommendations

CNSC staff recommend the following to the Commission:

- accept the proposed revised value of Cameco Corporation's financial guarantee for the Cigar Lake Operation;
- amend the CNSC licence issued to Cameco Corporation's Cigar Lake uranium mine (UML-MINE-CIGAR.00/2021) in order to conform to a standardized licence format; and
- direct Cameco Corporation to submit to the Commission, within 90 days of the publication of a decision, revised financial instruments that are acceptable to the Commission.

REFERENCES

[1] Correspondence from Mr. K. Lamont (Cameco) to Mr. G. Groskopf (CNSC) and Ms. F. McIntyre (SMOE), "*Preliminary Decommissioning Plan and Cost Estimate*", June 12, 2019, (e-Doc 5329312).

[2] Correspondence from Mr. C. McGuire (SMOE) to Mr. T. Hamilton (Cameco), "*2019 Cigar Lake Operation Preliminary Decommissioning Plan and Decommissioning Cost Estimate*", May 7, 2019, (e-Doc 6331299).

[3] Correspondence from Mr. M. Seier (Cameco) to Mr. S. Akhter (CNSC) and Ms. V. Bourhis (SMOE), "*Preliminary Decommissioning Plan and Cost Estimate*", September 10, 2012, (e-Doc 4003438).

[4] Memorandum of Understanding between Saskatchewan and AECB, Atomic Energy Control Board, September 1996, (e-Doc 3816864).

[5] CNSC Memorandum from Mr. R. Lall (WDD) to Mr. G. Groskopf (UMMD), "*Review of Cigar Lake Corporation Response to Comments on Cigar Lake Preliminary Decommissioning Plan and Cost Estimate*", October 5, 2018, (e-Doc 5633738).

[6] CNSC staff presentation to Northern Saskatchewan EQC, February 28, 2019, La Ronge, Saskatchewan, (e-Doc 5453246).

[7] Canadian Nuclear Safety Commission, Record of Decision, DEC 20-H101, *Application for Acceptance of a Revised Financial Guarantee and Licence Amendment for Cameco's Key Lake Operation*, dated July 29, 2020, (e-Doc 6346079).

ACRONYMS

AECB	Atomic Energy Control Board
Cameco	Cameco Corporation
CLO	Cigar Lake Operation
CNSC	Canadian Nuclear Safety Commission
CMD	Commission Member Document
CSA	Canadian Standards Association
DDP	Detailed Decommissioning Plan
EQC	Environmental Quality Committee
LCH	Licence Conditions Handbook
LoC	Letter of Credit
MDMER	*Metal Diamond Mining Effluent Regulations*
NSCA	*Nuclear Safety and Control Act*
PDCE	Preliminary Decommissioning Cost Estimate
PDP	Preliminary Decommissioning Plan
PDPCE	Preliminary Decommissioning Plan and Preliminary Cost Estimate
SMOE	Saskatchewan Ministry of Environment
UMMD	Uranium Mines and Mills Division
WDD	Wastes and Decommissioning Division

A. CIGAR LAKE GENERAL SITE LAYOUT MAP

B. BASIS FOR THE RECOMMENDATIONS

B.1 Regulatory Basis

The regulatory basis for the CNSC staff recommendations presented in this CMD is as follows:

Nuclear Safety and Control Act

Subparagraph 24(2)(a)(b) of the *Nuclear Safety and 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 and 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 the Commission.

Subsection 24(6) of the *Nuclear Safety and Control Act* provides that the Commission may authorize the application of the proceeds of any financial guarantee.

General Nuclear Safety and Control Regulations

The *General Nuclear Safety and Control Regulations* requires under paragraph 3(1)*(l)* that a licence application contains a description of any proposed financial guarantee relating to the activity to be licensed.

Uranium Mines and Mills Regulations

The *Uranium Mines and Mills Regulations* requires, under section 3(a)(viii), the proposed plan for the decommissioning of the mine or mill.

B.2 Technical Basis

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

- CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*
- CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*
- CSA Group standard N294-09, *Decommissioning of Facilities Containing Nuclear Substances*

PART TWO

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

1. Current Uranium Mine Licence UML-MINE-CIGAR.00/2021
2. Proposed licence changes
3. Proposed Uranium Mine Licence UML-MINE-CIGAR.01/2021
4. Draft Licence Conditions Handbook.

CURRENT LICENCE

e-Doc 4065563 (Word)

e-Doc 4065568 (PDF)

LICENCE

Directorate of Nuclear Cycle
and Facilities Regulation

Our file Notre référence

2.04

URANIUM MINE LICENCE
CAMECO CORPORATION
CIGAR LAKE OPERATION

I) LICENCE NUMBER: UML-MINE-CIGAR.00/2021

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

III) LICENCE PERIOD: This licence is valid from July 1, 2013 to June 30, 2021, unless otherwise suspended, amended, revoked, replaced or transferred.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

i) Prepare a site for, construct, operate, modify and decommission a nuclear facility (hereinafter "the facility") for the mining of uranium ore at a site known as the Cigar Lake Operation in the Province of Saskatchewan as shown on the drawing contained in Appendix A to this licence.

ii) Mine a nuclear substance (uranium ore).

iii) Import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices.

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 its associated Regulations.

iii) The UML-MINE-CIGAR.00/2021 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 this 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 objective of 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 objectives 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. HUMAN PERFORMANCE MANAGEMENT

3.1 The licensee shall implement and maintain a training program.

4. OPERATING PERFORMANCE

4.1 The licensee shall implement and maintain an operating program.

4.2 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.

4.3 The nuclear substances and radiation devices possessed by the licensee shall not exceed:

a) The possession limit for unsealed sources; and

b) The maximum activity per sealed source or device;

approved by the Commission or a person authorized by the Commission.

5. SAFETY ANALYSIS

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

6. PHYSICAL DESIGN

6.1 The licensee shall implement and maintain a design program.

7. FITNESS FOR SERVICE

7.1 The licensee shall implement and maintain a maintenance program.

8. *RADIATION PROTECTION*

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

9. *CONVENTIONAL HEALTH AND SAFETY*

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

10. ENVIRONMENTAL PROTECTION

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

10.2 The licensee shall where the effluent concentration reaches or exceeds the discharge limits in the *Metal Mining Effluent Regulations*, immediately investigate and take corrective action to ensure that the effluent concentration is maintained below the discharge limits.

11. EMERGENCY MANAGEMENT AND FIRE PROTECTION

11.1 The licensee shall implement and maintain an emergency management and fire protection program.

12. WASTE MANAGEMENT

12.1 The licensee shall implement and maintain a waste management program.

12.2 The licensee shall maintain a preliminary decommissioning plan for the facility.

12.3 The licensee shall maintain a financial guarantee acceptable to the Commission which shall remain valid and in effect and adequate to fund the Preliminary Decommissioning Plan referenced in licence condition 12.2 of this licence.

13. SECURITY

13.1 The licensee shall implement and maintain a security program.

14. SAFEGUARDS AND NON-PROLIFERATION

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

15. PACKAGING AND TRANSPORT

15.1 The licensee shall implement and maintain a packaging and transport program.

SIGNED at OTTAWA, this 12th day of June, 2013.

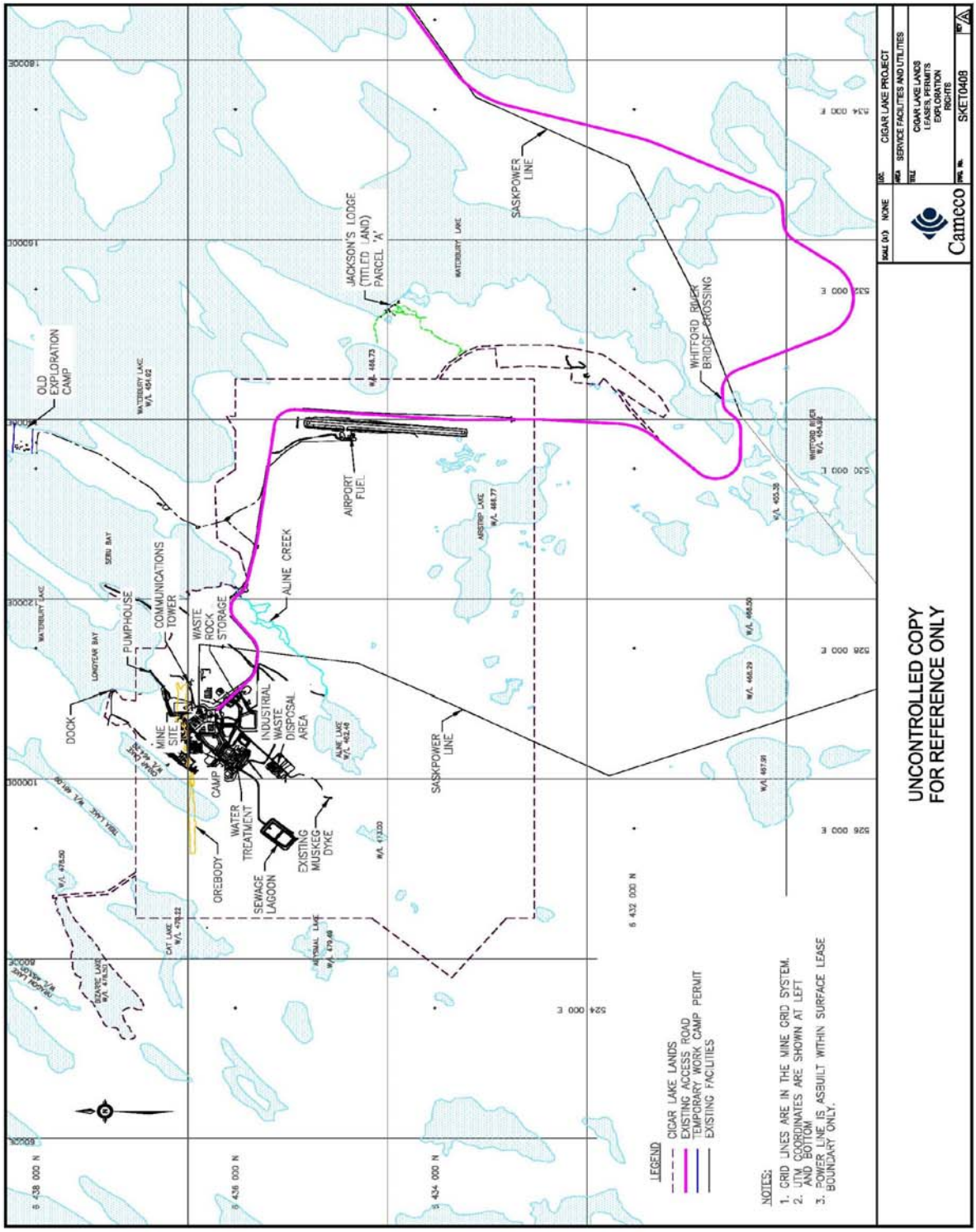
M. Binder

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

APPENDIX A

LOCATION OF CAMECO'S OPERATION AT CIGAR LAKE

The location of the Cameco's Operation at Cigar Lake is shown on Drawing SKET0408, Rev A (E-Docs #4053034).


OLD EXPLORATION CAMP
JACKSON'S LODGE (TITLED LAND) PARCEL 'A'
SASKPOWER LINE
WHITFORD RIVER BRIDGE CROSSING
AIRPORT FUEL
ALINE CREEK
DOCK
PUMPHOUSE
COMMUNICATIONS TOWER
WASTE ROCK STORAGE
MINE SITE
INDUSTRIAL WASTE DISPOSAL AREA
CAMP
WATER TREATMENT
SEWAGE LAGOON
EXISTING MUSKEG DYKE
OREBODY
SASKPOWER LINE
LEGEND
CIGAR LAKE LANDS
EXISTING ACCESS ROAD
TEMPORARY WORK CAMP PERMIT
EXISTING FACILITIES
NOTES:
1. GRID LINES ARE IN THE MINE GRID SYSTEM.
2. UTM COORDINATES ARE SHOWN AT LEFT AND BOTTOM.
3. POWER LINE IS ASBUILT WITHIN SURFACE LEASE BOUNDARY ONLY.
UNCONTROLLED COPY
FOR REFERENCE ONLY
Cameco
CIGAR LAKE PROJECT
SERVICE FACILITIES AND UTILITIES
CIGAR LAKE LANDS
LEASES, PERMITS
EXPLORATION
RIGHTS
SKET0408

PROPOSED LICENCE CHANGES

The table below shows the text in the current licence and the corresponding changes in the proposed licence. For each proposed change, CNSC staff have provided the rationale and comments supporting the change, in the right column, entitled rational or comments.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
	"Draft" is on the document.	-DELETE ROW- Administration to correct during process.
First page - File number and directorate name are at the top on the first page.	File number and directorate name are **not** on the header.	-DELETE ROW- Administration to correct during process.
Page 2 and remaining pages: "Licence" on top right page of header.	Page 2 and remaining pages: Top right page of header: Licensee and Operation name on first line, title of licence on second line.	If pages are separated, apparent to which licence the page belongs to.
Roman numerals following IV) LICENSED ACTIVITIES and V) EXPLANATORY NOTES	Alphabetical following IV) LICENSED ACTIVITIES and V) EXPLANATORY NOTES	Change from roman numerals to alphabetical following the key headings. Eliminate possible confusion towards numbering.
I) LICENCE NUMBER: UML-MINE-CIGAR.00/2021	**I) LICENCE NUMBER: UML-MINE-CIGAR.01/2021**	New version.
IV) LICENSED ACTIVITIES iii) Import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (i) and (ii).	**IV) LICENSED ACTIVITIES** c) possess, transfer, import, use, store, and dispose of nuclear substances	Nuclear substances and prescribed equipment separated and activities brought in line with activities permitted under the NSCA for nuclear substances. Authorized activities listed in order of the NSCA.
IV) LICENSED ACTIVITIES iii) Import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (i) and (ii).	**IV) LICENSED ACTIVITIES** d) possess, transfer, import, use, store prescribed equipment that is required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (a) and (b).	Nuclear substances and prescribed equipment separated and activities brought in line with activities permitted under the NSCA for nuclear substances. Authorized activities listed in order of the NSCA.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
V) EXPLANATORY NOTES: iii) The UML-MINE-CIGAR.00/2021	**V) EXPLANATORY NOTES:** **c)** The UML-MINE-CIGAR.01/2021	New version.
V) EXPLANATORY NOTES: **iii)** The LCH also provides information regarding delegation of authority and applicable version control of documents.	**V) EXPLANATORY NOTES:** **c)** The LCH also provides information regarding delegation of authority and applicable version control of documents comprising compliance verification criteria.	New standardized text.
VI) CONDITIONS: 1. **GENERAL**	**VI) CONDITIONS:** **G. GENERAL**	New standardized text.
1.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the objective of the licensing basis.	**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").	New standardized text.
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 objectives 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.	**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.	New standardized text.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
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.		Text removed.
12.3 The licensee shall maintain a financial guarantee acceptable to the Commission. The financial guarantee shall be reviewed and updated every five years or if there are material changes.	**G.3 Financial Guarantee** The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.	Five year requirement moved to the LCH.
1.5 The licensee shall implement and maintain a program for public information for the facility, including a public disclosure protocol.	**G.4 Public Information and Disclosure** The licensee shall implement and maintain a public information and disclosure program.	Standardized text.
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.	**1. MANAGEMENT SYSTEM** **1.1 Management System** The licensee shall implement and maintain a management system.	Condition 2.2 Not required as already covered in GNSCR 12(e). Not a standard condition. Title added.
3. HUMAN PERFORMANCE MANAGEMENT 3.1 The licensee shall implement and maintain a training program.	**2. HUMAN PERFORMANCE MANAGEMENT** **2.1 Training Program** The licensee shall implement and maintain a training program.	Title added.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
4. OPERATING PERFORMANCE 4.1 The licensee shall implement and maintain an operating program. 4.2 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. 4.3 The nuclear substances and radiation devices possessed by the licensee shall not exceed: a) The possession limit for unsealed sources; and b) The maximum activity per sealed source or device; approved by the Commission or a person authorized by the Commission.	**3. OPERATING PERFORMANCE** **3.1 Operations Program** The licensee shall implement and maintain an operating program, which includes a set of operating limits. **3.2 Reporting Requirements** The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission. **3.3 Nuclear Substances and Radiation Devices** The licensee shall implement and maintain a program for nuclear substances and radiation devices.	Uranium mines and mills operating limits are required through the *Metal Diamond Mines Effluent Regulations.* Nuclear substance standard condition applied. Further information on expectations to meet licence conditions is provided in the LCH.
5. SAFETY ANALYSIS 5.1 The licensee shall implement and maintain a safety analysis program.	**4. SAFETY ANALYSIS** **4.1 Safety Analysis Program** The licensee shall implement and maintain a safety analysis program.	Title added.
6. PHYSICAL DESIGN 6.1 The licensee shall implement and maintain a design program.	**5. PHYSICAL DESIGN** **5.1 Design Program** The licensee shall implement and maintain a design program.	Title added.
7. FITNESS FOR SERVICE 7.1 The licensee shall implement and maintain a maintenance program.	**6. FITNESS FOR SERVICE** **6.1 Fitness for Service Program** The licensee shall implement and maintain a fitness for service program.	Minor change to text and title added. Change in terminology has no impact on required submissions or content of submissions from licensees.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
8. RADIATION PROTECTION 8.1 The licensee shall implement and maintain a radiation protection program.	**7. RADIATION PROTECTION** **7.1 Radiation Protection Program** The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.	Minor change to text and title added. Licensee already has a Radiation Code of Practice which includes a requirement to notify the Commission within 24 hours of triggering an action level.
9. CONVENTIONAL HEALTH AND SAFETY 9.1 The licensee shall implement and maintain an occupational health and safety program.	**8. CONVENTIONAL HEALTH AND SAFETY** **8.1 Conventional Health and Safety Program** The licensee shall implement and maintain a conventional health and safety program.	Minor change to titles.
10. ENVIRONMENTAL PROTECTION 10.1 The licensee shall implement and maintain an environmental protection program. 10.2 The licensee shall where the effluent concentration reaches or exceeds the discharge limits in the *Metal and Diamond Mining Effluent Regulations*, immediately take corrective action and investigate.	**9. ENVIRONMENTAL PROTECTION** **9.1 Environmental Protection Program** The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.	Minor change to text and titles. Licensee already has an Environmental Code of Practice which includes a requirement to notify the Commission within 24 hours of triggering an action level. *Metal and Diamond Mining Effluent Regulations* (MDMER) is a regulatory requirement which includes information on various reporting requirements throughout the document. A licence condition is not necessary to ensure the MDMER is applicable.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
11. EMERGENCY MANAGEMENT AND FIRE PROTECTION 11.1 The licensee shall implement and maintain an emergency management and fire protection program.	10. **EMERGENCY MANAGEMENT AND FIRE PROTECTION** **10.1 Emergency Preparedness Program** The licensee shall implement and maintain an emergency preparedness program. **10.2 Fire Protection Program** The licensee shall implement and maintain a fire protection program.	Minor change to text and titles. Serration of emergency preparedness (management) and fire protection.
12. WASTE MANAGEMENT 12.1 The licensee shall implement and maintain a waste management program. 12.2 The licensee shall maintain a preliminary decommissioning plan for the facility.	**11. WASTE MANAGEMENT** **11.1 Waste Management Program** The licensee shall implement and maintain a waste management program. **11.2 Decommissioning Strategy** The licensee shall maintain a decommissioning plan.	Minor change to text and the addition of titles.
12.3 The licensee shall maintain a financial guarantee acceptable to the Commission. The financial guarantee shall be reviewed and updated every five years or if there are material changes.	**G.3 Financial Guarantee** The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.	Second time change appears in table. Minor change to text; addition of title. Five year requirement is specified in the LCH.
13. SECURITY 13.1 The licensee shall implement and maintain a security program.	**12. SECURITY** **12.1 Security Program** The licensee shall implement and maintain a security program.	Title added..
14. SAFEGUARDS AND NON-PROLIFERATION 14.1 The licensee shall implement and maintain a safeguards and non-proliferation program.	**13. SAFEGUARDS AND NON-PROLIFERATION** **13.1 Safeguards Program** The licensee shall implement and maintain a safeguards program.	Minor change to text and added title.

CURRENT LICENCE	PROPOSED LICENCE	RATIONAL OR COMMENTS
15. PACKAGING AND TRANSPORT 15.1 The licensee shall implement and maintain a packaging and transport program.	**14. PACKAGING AND TRANSPORT** **14.1 Packaging and Transport Program** The licensee shall implement and maintain a packaging and transport program.	Title added.
Michael Binder, President on behalf of the Canadian Nuclear Safety Commission	Rumina Velshi, President on behalf of the Canadian Nuclear Safety Commission	New President.

PROPOSED AMENDED LICENCE

e-Doc 6278488 (Word)

e-Doc 6284709 (PDF)

DRAFT

URANIUM MINE LICENCE
CAMECO CORPORATION
CIGAR LAKE OPERATION

I) LICENCE NUMBER: UML-MINE-CIGAR.01/2021

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 July 1, 2013 to June 30, 2021, unless otherwise suspended, amended, revoked or replaced.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

a) prepare a site for and construct, operate, modify and decommission a nuclear facility (hereinafter "the facility") for the milling of uranium ore at a site known as the Cigar Lake Operation in the province of Saskatchewan as shown on the drawing referenced in appendix A to this licence;

b) mine a nuclear substance (uranium ore);

c) possess, transfer, import, use, store, and dispose of nuclear substances; and

d) possess, transfer, import, use prescribed equipment that is required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (a) and (b).

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 UML-MINE-CIGAR.01/2021 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. HUMAN PERFORMANCE MANAGEMENT

2.1 Training Program

The licensee shall implement and maintain a training program**.**

3. OPERATING PERFORMANCE

3.1 Operations Program

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

3.2 Reporting Requirements

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

3.3 Nuclear Substances and Radiation Devices

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

4. SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5. PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

6. FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7. *RADIATION PROTECTION*

7.1 Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

8. *CONVENTIONAL HEALTH AND SAFETY*

8.1 Conventional Health and Safety Program

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

9. ENVIRONMENTAL PROTECTION

9.1 Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11. WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The licensee shall maintain a decommissioning plan.

12. SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

13. SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

14. PACKAGING AND TRANSPORT

14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

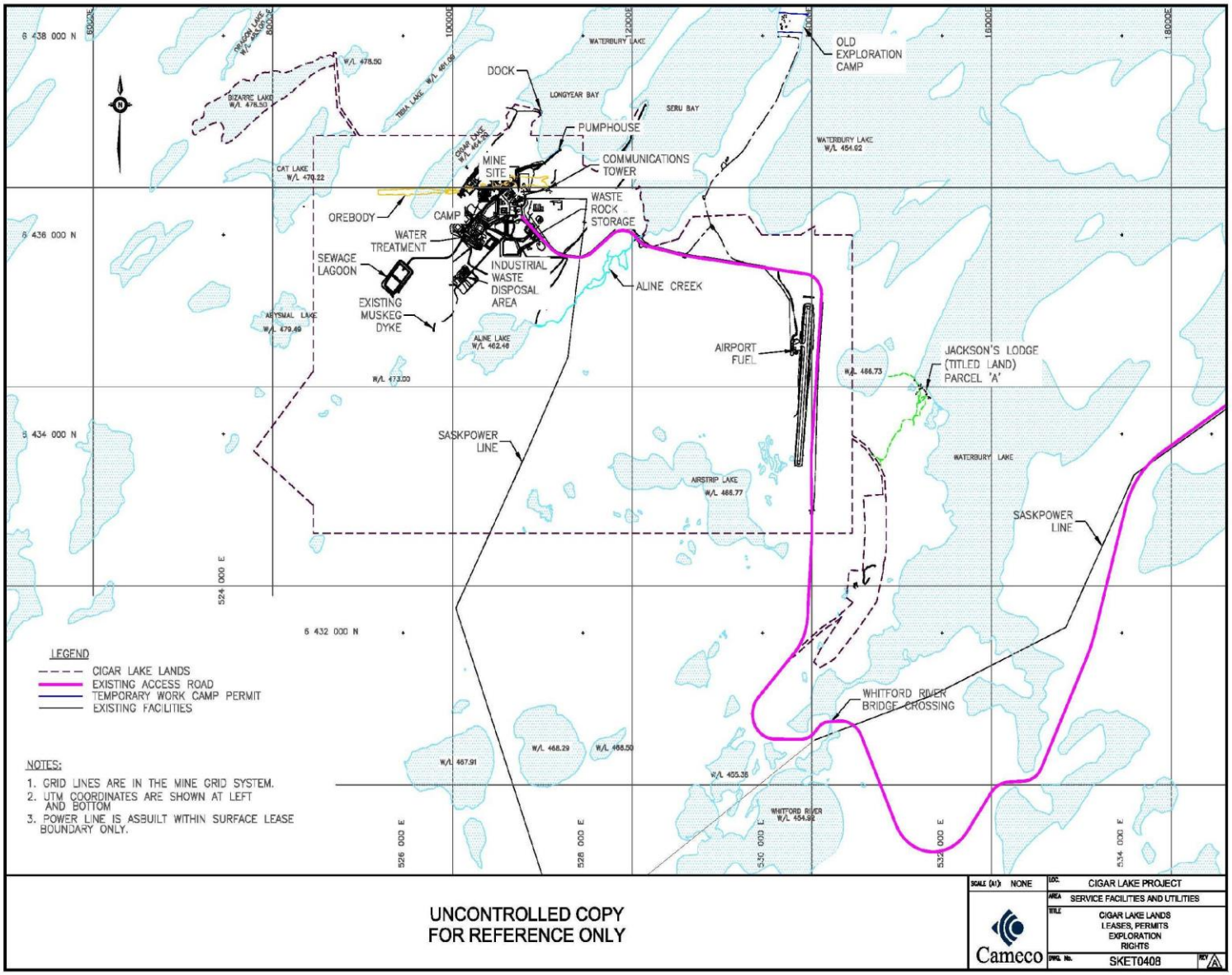
SIGNED at OTTAWA, this _____ day of _____, 2020.

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

APPENDIX A

LOCATION OF CAMECO'S OPERATION AT CIGAR LAKE

The location of the Cameco's Operation at Cigar Lake is shown on Drawing SKET0408, Rev A (e-Doc #4053034).



e-Doc 6278488 (Word)
e-Doc 6284709 (PDF)

CURRENT LICENCE CONDITIONS HANDBOOK

e-Doc 4056563 (Word)

e-Doc 4068688 (PDF)

Canada's Nuclear Regulator

e-DOC 4056563 (Word)
e-DOC 4068688 (PDF)

LICENCE CONDITIONS HANDBOOK

CIGAR LAKE OPERATION
URANIUM MINE LICENCE

UML-MINE-CIGAR.00/2021

Revision 1

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

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Licence Conditions Handbook **Effective: January 23, 2014**

Cigar Lake Operation

Uranium Mine Licence

UML-MINE-CIGAR.00/2021

SIGNED at OTTAWA this 23st day of January 2014

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

Revision History:

Effective Date	Revision	Section(s) changed	Description of the Changes	DCR E-Doc #
	0	N/A	Original document	4056563 (Word) 4068688 (PDF)
January 23, 2014	1	1.2, 1.3, 4.1, 4.3, 10.2, 14.1, Appendix A & C	Formatting changes, updated text on delegation of authority for consistency between UMM LCH's, updated text on reporting for consistency, updated references, added table of radiation devices	4170399

TABLE OF CONTENTS

PART I: INTRODUCTION

1 Background

1.1 Objective

This Licence Conditions Handbook (LCH) identifies criteria that will be used by the Canadian Nuclear Safety Commission (CNSC) staff to assess licensee compliance with the Licence Conditions (LCs) listed in the Uranium Mine Licence (UML) UML-MINE-CIGAR.00/2021. It also establishes provisions for the delegation of authority and conflict resolution.

To support these objectives, the LCH contains the following information:

- A description of each section of the UML
- Background information and compliance verification criteria for each LC
- Delegation of authority to CNSC staff where applicable
- Reference to licensee documentation with version control
- Reference to applicable Canadian Standards Association (CSA) standards or CNSC regulatory documents with version control
- LCH change control procedure

The LCH is intended for use by both the licensee and CNSC staff and should be read in conjunction with UML-MINE-CIGAR.00/2021.

1.2 Delegation of Authority

The statement “a person authorized by the Commission” in 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 Authority) 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

2 DESCRIPTION OF THE SECTIONS IN THE UML

2.1 Section I: Licence Number

The alpha numeric expression UML-MINE-CIGAR.00/2021 stems from the CNSC standard convention for identifying licences. The following table provides a description of each identifier used in the expression:

Identifier	Description
UML	Uranium Mine Licence
MINE	Refers to type of facility (MINE, MILL, MINEMILL)
CIGAR	Refers to facility name
00	Licence version number (00 = Initial licence, 01 = Amendment No. 1, etc.)
2021	Expiration year

2.2 Section II: Licensee

This section of the licence provides the name and the address of the corporate entity that holds the licence, which is referred hereinafter as the "licensee". The licensee is:

Cameco Corporation
2121 – 11th Street West
Saskatoon, SK S7M 1J3

2.3 Section III: Licence Period

This section of the licence identifies the duration for which the licence is valid. The licence period for UML-MINE-CIGAR.00/2021 is from July 1, 2013 to June 30, 2021, unless suspended, amended, revoked, replaced or transferred.

2.4 Section IV: Licensed Activities

This section of the licence identifies the activities that are being licensed. The box below contains a copy of the text in the licence. The authorized activities are from the list of activities described in section 26 of the *Nuclear Safety and Control Act* (NSCA).

This licence authorizes the licensee to:

i) Prepare a site for, construct, operate, modify and decommission a nuclear facility (hereinafter "the facility") for the mining of uranium ore at a site known as the Cigar Lake Operation in the Province of Saskatchewan as shown on the drawing contained in Appendix A to this licence.

ii) Mine a nuclear substance (uranium ore).

iii) Import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices.

The authorized activities at the Cigar Lake Operation include:

- Operation of the underground mine, underground ore-processing facility and surface ore load-out facility
- Use Jet Boring System (JBS) for mining the ore
- Mining and processing ore from the facility
- Mining up to 7.0 million kg of uranium per year, with a production flexibility up to 9.25 million kg of uranium
- Operation of the Water Treatment Plants
- Storage of clean and special-waste rock
- Handling and storage of hazardous materials and disposal of hazardous wastes
- Possession, storage, transfer, importation, use and disposal of nuclear substances and radiation devices

Environmental assessments first carried out in 1995 and most recently in 2011 have evaluated the environmental effects from Cameco's operation at Cigar Lake at an annual production rate up to 7.0 million kg of uranium. Production flexibility allows the licensee to recoup production shortfalls experienced throughout the mine operation. An increase above the authorized annual production rate of 7.0 million kg of uranium per year, or above the production flexibility of 9.25 million kg of uranium per year would need to be reviewed by CNSC staff.

2.5 Section V: Explanatory Notes

This section of the licence provides the following clarifications and introduces the LCH as a compliance tool.

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 its associated Regulations.

iii) The UML-MINE-CIGAR.00/2021 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.

2.6 Section VI: Conditions

This section of the licence lists the LCs.

PART II: FRAMEWORK FOR EACH CONDITION

This section of the LCH provides additional information for each LC including information on the requirements and guidance for meeting each LC, references to licensee documents submitted to meet the requirements and the compliance verification criteria that will be used to verify that the condition is being met and to measure performance.

In assessing compliance with the LCs, CNSC staff will apply a risk-informed approach that is focused on the facilities, activities and supporting programs that can impact the safe operation of the nuclear facility, health and safety of persons, environment, security or compliance with international agreements. The frequency and depth of CNSC verification activities and any subsequent regulatory enforcement will be commensurate with the overall risk.

The information for each LC or group of conditions is organized in the following manner.

Preamble

This section contains background history and/or the regulatory context related to the LC and provides, where applicable, the related regulatory requirements contained in the NSCA and its associated Regulations.

Compliance Verification Criteria

CNSC compliance verification will be limited to activities that may impact the safe operation of the nuclear facility, the health and safety of persons, the environment, and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

The manner of verification of the regulated activities will commensurate with:

- The risk to the health and safety of persons
- The risk to the environment
- The risk to national security
- The effective implementation of measures of control
- International obligations to which Canada has agreed
- The past compliance record of the licensee

This section identifies the criteria or the sources from which the CNSC develops compliance verification criteria that are used to verify compliance with regulatory requirements. Applicable standards such as CSA standards, national codes and guidelines, and/or CNSC regulatory documents are identified. Where there are no published standards or regulatory documents, CNSC expectations are presented as principles. Finally, the licensee is expected to comply with the information provided in licensee produced documents that support the licence application. The key documents are referenced where applicable. Compliance verification criteria are also developed from the information contained in these key documents.

Document Version Control

The documents, and the applicable version, that are used to assess compliance with LCs are identified in this section. These documents include applicable standards, codes and guidelines and CNSC regulatory documents and licensee produced documents such as programs, procedures, work instructions, specifications, drawings, design criteria, process criteria, standards, or plans. If one of the noted documents is revised, a new sub-entry will be added for the revised document and the previous revision will be shaded.

Recommendations and Guidance

This section contains guidance on how to comply with the LC and achieve a high level of safety. It may also include recommended industry best practices to help the licensee achieve fully satisfactory performance. As such, it may refer to documents that are not within the licensing basis. The recommendations and guidance are non-mandatory and licensees may propose alternate ways to meet the LC.

1 GENERAL

1.1 Licensing Basis

Licence Condition 1.1

The licensee shall conduct the activities described in Part IV of this licence in accordance with the objective of the licensing basis.

Preamble

Licence Condition 1.1 requires that activities be conducted in accordance with the objective of licensing basis.

As defined in CNSC Information Document INFO-0795, *Licensing Basis Objective and Definition*, the licensing basis for a nuclear facility or activity is a set of documents or requirements comprising:

(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 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

The "documents needed to support the licence application" contain the information which demonstrates that the applicant is qualified to carry out the licensed activity and that appropriate provisions will be implemented and maintained for the protection of the health and safety of workers, the public and the environment and to meet Canada's international obligations.

Appendix C of the LCH lists the key Cameco documents which are deemed to contain the safety and control measures that are considered to form item (iii) of the licensing basis.

Compliance Verification Criteria

Compliance verification criteria are identified throughout the LCH.

Documents that Require Version Control

Documents that require version control identified throughout the LCH.

Recommendations and Guidance

There are no recommendations or guidance.

1.2 Changes that Meet Objective of the Licensing Basis

Licence Condition 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.

Preamble

Licence Condition 1.2 stipulates that the licensee may make changes to the facility, its operation or safety and control measures described in the documents needed to support the application as long it can be demonstrated that the changes meet the objective of the licensing basis.

During the course of the licensed activities, it is expected that the licensee will periodically make changes to implement improvements or to address changes in operational needs.

The objective 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 that was defined in the various safety analyses such as ecological risk assessments, human health risk assessments, and Hazard and Operability Studies that were carried out in support of the licence application.

1.3 Changes to Supporting Documents

Licence Condition 1.3

The licensee shall give written notification to the Commission of any changes made to the documents needed to support the licence application.

Preamble

Licence Condition 1.3 requires written notification of any changes to the key licensee documents listed in Appendix C of the LCH. Written notification for significant changes must be made prior to implementing the changes and must include an assessment of the proposed changes, identification and assessment of potential risks and impacts and proposed mitigation measures. Written notification of minor or administrative changes may be made in batches after the changes have been implemented.

Compliance Verification Criteria

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 objective of the licensing basis. Written notification of minor or administrative changes may be made in batches after the changes have been implemented.

CNSC staff will review the proposed changes to determine if they are within the objective of the licensing basis in accordance with the process described in Appendix A.

A Delegated Authority will review CNSC staff's assessment and issue the determination. CNSC staff will report on significant changes made to the LCH during the previous year in their annual report to the Commission.

CNSC staff will review the notifications of minor and administrative changes to verify that no formal review is required.

Documents that Require Version Control

Licensee documents that require version control are listed in Appendix C of the LCH. All changes to these documents require a change to the LCH. Sections of these documents applicable to each LC are identified in *Documents that Require Version Control* section following each LC.

Recommendations and Guidance

There are no recommendations or guidance.

1.4 Resolution of Conflicts or Inconsistencies

Licence Condition 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.

Preamble

In the event of any conflict or inconsistency between LCs or any documents referenced in the LCH, the licensee shall direct the conflict or inconsistency to the CNSC for resolution (see Appendix A, section A.3)

The licensee and CNSC staff will discuss any identified conflicts and inconsistencies to ensure a common understanding of CNSC expectations. The resolution of these conflicts and inconsistencies will be documented by CNSC staff and acknowledged by the licensee.

A list of resolutions made pursuant to this LC will be recorded in Appendix E of this LCH. This Appendix will list the subject of the conflict or inconsistency and will give the reference to the electronic record of the resolution.

Compliance Verification Criteria

CNSC staff will ensure through compliance activities that the licensee is complying with the resolution, as formally communicated by the CNSC. Where appropriate, changes will be incorporated into compliance verification criteria.

Document Version Control

There are no documents requiring version control.

Recommendations and Guidance

There are no recommendations or guidance.

1.5 Public Information and Disclosure

Licence Condition 1.5

The licensee shall implement and maintain a program for public information for the facility, including a public disclosure protocol.

Preamble

The primary goal of the Public Information Program is to ensure that information related to the health and safety of persons and the environment and other issues associated with the life cycle 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

The Public Information Program will be evaluated against the regulatory requirements and guidance in *RD/GD 99.3, Public Information and Disclosure.*

Document Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Public Information Program	Revision 2	December 2012	4052377
CNSC	RD/GD-99.3 Public Information and Disclosure	Version 1.0	March 2012	N/A

Recommendations and Guidance

There are no recommendations or guidance.

2 MANAGEMENT SYSTEM

The Safety and Control Area "Management System" 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.

2.1 Management System

Licence Condition 2.1

The licensee shall implement and maintain a management system.

Preamble

This LC requires that the licensee implement and maintain a management system that brings together in a planned systematic and integrated manner the processes for managing the nuclear facility, the actions necessary to satisfy the requirements set out in the NSCA, the regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system.

Compliance Verification Criteria

The management system will be evaluated against the following principles:

2.1.1 Safety is the paramount consideration guiding all decisions and actions.

2.1.2 The business is defined, planned, and controlled. The required quality and the means of achieving it are defined.

2.1.3 Planning identifies and prioritizes hazards, risks, controls, legal requirements, other requirements, management system deficiencies, and opportunities for improvement.

2.1.4 The organization is defined and understood.

2.1.5 Infrastructure and resources needed to achieve health and safety objectives and targets are provided and managed.

2.1.6 Communication is effective.

2.1.7 Information is managed. The preparation and use of documents are controlled. Essential records are maintained.

2.1.8 Work is managed. Work activities are planned and controlled.

2.1.9 Potential problems are identified and resolved. Deficiencies are identified and remedied.

2.1.10 The supply chain process is established and controlled.

2.1.11 A design process is established and controlled.

2.1.12 Changes to accepted items, processes and practices are controlled.

2.1.13 The facility is operated, monitored, and maintained in accordance with documentation that is consistent with the design basis.

2.1.14 Assessments both self and independent are performed.

2.1.15 Managers at all levels regularly assess the management processes for which they are responsible.

2.1.16 Senior management reviews the management system at planned intervals to ensure its continuing adequacy and effectiveness. Experience is sought, shared, and used. The management system is continually improved.

Documents that Require Version Control

Source	Description of Revision Change	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Quality Management Program	Revision 2	November 2012	4043422

Recommendations and Guidance

There are no recommendations or guidance.

2.2 Management of Contractors

Licence Condition 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.

Preamble

This LC requires that the licensee retain responsibility for the protection of the health, safety, and security of the public and workers, and the protection of environment when contractors perform licensed activities.

Compliance Verification Criteria

The management of contractors shall be evaluated against the following principles:

2.2.1 The risks to contractors and risks to the organization from the use of contractors are evaluated to identify, assess, and eliminate or control hazards.

2.2.2 The duties and authorities of contractor personnel are clearly defined and documented.

2.2.3 When the licensee requires contractors to implement parts of the management system, the licensee is directly responsible for ensuring expectations are established, understood and achieved.

2.2.4 Contractors are adequately trained on relevant licensee procedures and are qualified and competent.

2.2.5 Qualified and competent members of the licensee's staff maintain oversight of the contractors' performance. The oversight program is planned, defined and the results documented.

2.2.6 Contractor personnel are held to the same performance standards as licensee employees.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facilities Licensing Manual	Revision 9	October 2012	4026013
Cameco	Training Development Program	Revision 2	November 2012	4040583

Recommendations and Guidance

There are no recommendations or guidance.

3 HUMAN PERFORMANCE MANAGEMENT

The Safety and Control Area "Human Performance Management" covers activities that enable effective human performance through the development and implementation of processes to ensure that licensee staff members are sufficient in numbers in all relevant job areas and have the necessary knowledge, skills, and tools in place to safely carry out their duties.

3.1 Training Program

Licence Condition 3.1

The licensee shall implement and maintain a training program.

Preamble

This LC requires that the licensee implement and maintain a program to provide training to ensure that employees and contractors are trained and assessed to confirm that they have acquired and maintained the knowledge, skills, and competencies to safely perform their work assignments.

Compliance Verification Criteria

The CNSC endorses a Systematic Approach to Training (SAT) as an effective method to establish and maintain training for workers. The Training Program will be evaluated against the following elements of SAT:

3.1.1 A training system is implemented and maintained to ensure that training programs are systematically defined, designed, developed, implemented, evaluated, recorded and managed.

3.1.2 A training system is implemented and maintained to provide a logical progression from an analysis of the training requirements and identification of the qualifications and competencies required for performing a job, to the design, development, implementation, evaluation and management of training. This includes the respective training materials, and the subsequent evaluation and continuous improvement of the training courses and training programs.

3.1.3 All performance requirements of a capability, job or duty are identified by conducting a job analysis to determine all of the tasks, subtasks and task elements involved.

3.1.4 The necessary general worker training, initial job training and continuing training requirements for workers, based on a task analysis of the knowledge, skills, abilities and attitudes required to perform the duties of their position are defined and documented.

3.1.5 Appropriate training is designed, developed and implemented to meet the qualification and competency requirements.

3.1.6 Trainers meet and maintain documented qualification and competency requirements, particularly in the areas of subject matter expertise and instructional skills.

3.1.7 Formal evaluations confirm and document that each trained worker is qualified and competent to perform the duties of his or her position.

3.1.8 The change management process identifies required training and modifications to the training programs.

3.1.9 Continuing training that includes updates to training programs stemming from the change management process is provided to workers.

3.1.10 The results of periodic training program evaluations are incorporated into training program improvements.

3.1.11 Workers are trained in current procedures and in relevant system and equipment configurations and are competent to perform the duties of their position.

3.1.12 Workers' training and qualifications records are established and maintained.

3.1.13 Workers have a level of training related to nuclear safety including but not limited to radiation safety, onsite emergency arrangements, conventional health and safety and environmental protection corresponding to the duties of their position and employment.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Training Development Program	Revision 2	November 2012	4040583

Recommendations and Guidance

Guidance on training programs is provided in CNSC Operational Document HPD-TPE-01, *Objectives and Criteria for Regulatory Evaluation of Nuclear Facility Training Programs, Human Performance Division, Directorate of Assessment and Analysis,* February 2005.

4 OPERATING PERFORMANCE

The Safety and Control Area "Operating Performance" includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.

4.1 Operating Performance

Licence Condition 4.1

The licensee shall implement and maintain an operating program.

Preamble

This LC requires that the licensee implement and maintain an operating performance program for the conduct of the licensed activities including the siting, construction and operation of the nuclear facility. Construction includes the commissioning of the constructed structures, systems and components. Operation includes the care and maintenance of facilities that are temporarily shut down. Operation also includes the remediation of areas of the facility where no further activities are expected to occur.

Compliance Verification Criteria

The conduct of licensed activities must comply with operating limits identified in the Mining Facility Licensing Manual and with the requirements of the Environmental Code of Practice, the Radiation Code of Practice and the Mine Ventilation Code of Practice.

Effluent discharged from mine water treatment plant and contingency water treatment system must comply with the limits for final treated effluent quality as stipulated in LC 10.2.

The design, construction, operation and maintenance of ventilation systems will be assessed against CNSC Regulatory Document G-221, *A Guide to Ventilation Requirements for Uranium Mines and Mills*, June 2003.

Mining is carried out under Cameco's *Mining Operations Program.* Underground ore processing is carried out under Cameco's *Processing Operations Program.* The licensee is required to submit the following status reports at different stages of the project:

1. Status Report 1 - Cameco shall submit a status report of the JBS performance of the drilling test demonstrating the success criteria have all been met and any deficiencies addressed prior to moving Part two for jetting cavities in waste rock.
2. Status Report 2 - Cameco shall submit status reports after completion of Stage 1 and 2 Commissioning and provide Readiness review for commissioning with water and waste.
3. Status Report 3 - Cameco shall submit status reports after completion of commissioning with water and waste and provide Readiness review for commissioning with ore.
4. Status Report 4 - Cameco shall submit a status report including design changes, concessions and procedural modifications after completion of commissioning with ore and a notification of moving into stage 4 commissioning (operation).
5. Status Report 5 - Cameco shall submit a status report after one year from initial commissioning with ore including any additional design changes, concessions and procedural modifications for the high risk Safety and Control Areas (SCAs) including but not limited to Radiation Protection, Emergency Management and Human Performance (Training) based on the results of the ore mining and processing.

Construction, commissioning and operating performance will be evaluated against the following principles:

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

4.1.2 Construction activities are carried out in accordance with drawings and specifications and related work instructions.

4.1.3 Installation procedures and work instructions are documented, reviewed, and approved.

4.1.4 Equipment and systems are commissioned in accordance with documentation prepared prior to commissioning.

4.1.5 Commissioning documentation is reviewed for conformity to the design.

4.1.6 Commissioning reports identify the acceptability of the commissioning results.

4.1.7 The turnover of structures, systems, components, and documents to operations is controlled.

4.1.8 The mine and associated facilities are operated, monitored, and maintained in accordance with documentation that is consistent with the design and licensing basis.

4.1.9 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:

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

4.1.11 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).

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

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

4.1.14 Work is assigned to qualified personnel.

4.1.15 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.

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

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

4.1.18 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

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Mining Operations Program	Revision 1	November 2012	4043427
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Environmental Code of Practice	Revision 1	September 2013	4200759
Cameco	Radiation Protection Program	Revision 3	November 2012	4036630
Cameco	Radiation Code of Practice	Revision 3	November 2012	4036630
Cameco	Processing Operations Program	Revision 1	November 2012	4036654
Cameco	Mine Ventilation Code of Practice	Revision 5	October 2013	4224647
CNSC	G-221, A Guide to Ventilation Requirements for Uranium Mines and Mills	June 2003	N/A	N/A

Recommendations and Guidance

There are no recommendations or guidance.

4.2 Reporting to the Commission

Licence Condition 4.2

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 associated Regulations.

Preamble

This LC requires the licensee to implement and maintain a process for reporting information to the CNSC. This includes monitoring results, performance assessments and the occurrence and response to unusual events.

Compliance Verification Criteria

The Cigar Lake Operation is subject to requirements of other federal and provincial regulatory agencies. The licensee shall report any material violation of applicable law at the federal, provincial or municipal level that pertain to the activities authorized by this licence. A “material violation” is a violation that impacts the ability of a licensee to carry out its licensed activities in

a way that takes into consideration the protection of the environment, health and safety of persons, maintenance of national security and measures required to implement international obligations to which Canada has agreed. When material violations occur the licensee is expected to report the violation by providing the CNSC with copies of the report(s) or notification(s) prepared for other governing regulatory bodies.

The licensee shall report upon becoming aware of the following events:

- That a discharge limit specified in section 10.2 of the LCH has been reached or exceeded
- That an action level (AL) specified in the Environmental Code of Practice has been reached
- A release of hazardous substance into the environment that was not authorized by the licence
- An AL specified in the Radiation Code of Practice has been reached
- An AL specified in the Ventilation Code of Practice has been reached

Preliminary reports of failures or events should be made via fax or e-mail within 24 hours of becoming aware of the event. Preliminary reports must describe the location and circumstances of the situation, and any action that the licensee has taken or proposes to take with respect to it. A supplementary report must be submitted within 21 days of the event.

The licensee shall submit to the CNSC on a quarterly basis, within 90 days after the end of each quarter of a calendar year, the results of:

- The Radiation Monitoring Program including quality assurance and quality control information - more frequent reporting may be requested on a case-by-case basis
- The Environmental Monitoring Program including quality assurance and quality control information - more frequent reporting may be requested on a case-by-case basis

The licensee shall issue worker radiation dose records, within 90 days after the end of each quarter of a calendar year, to:

- The worker
- The CNSC
- The National Dose Registry (NDR)

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

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Radiation Protection Program	Revision 3	November 2012	4036630

Recommendations and Guidance

Guidance on information to be contained in the annual report is provided in *CNSC-Saskatchewan Harmonized Annual Reporting Requirements,* August 2010 (e-DOC 3678482).

4.3 Nuclear Substances and Radiation Devices

Licence Condition 4.3

The nuclear substances and radiation devices possessed by the licensee shall not exceed:

a) The possession limit for unsealed sources; and

b) The maximum activity per sealed source or device;

approved by the Commission or a person authorized by the Commission.

Preamble

This LC places restrictions on the amount of nuclear substances and the types of radiation devices for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices that the licensee can import, possess, use, store, transfer, and dispose of.

Cameco must receive CNSC consent before acquiring amounts of nuclear substances and the types of radiation devices not included on the following tables.

Compliance Verification Criteria

The authorized possession limits for unsealed nuclear substances are:

Nuclear Substance	Limit on Total Activity of Unsealed Sources
Radium -226	0.4 MBq
Barium-133	4 MBq

The maximum authorized quantity of nuclear substances per sealed source is:

Nuclear Substance	Limit on Activity of Any Single Sealed Source
Uranium-238	5 kBq
Radium -226	0.037 MBq
Cesium-137	7.4 GBq
Thorium-230	0.037 MBq
Strontium-90	0.037 MBq
Americium-241*	0.037 MBq
Cobalt-60	3.7 MBq
Thallium-204	3.7 MBq
Plutonium-238	0.037 MBq
Curium-244	0.037MBq

* Nuclear substances used for exploration activities may be stored and used throughout Saskatchewan and Nunavut.

The authorized make and model of radiation devices and the maximum quantity of nuclear substance per each device:

Radiation Device Make and Model	Nuclear Substance	Maximum Quantity per Radiation Device
Ronan Engineering SA-1	Cesium-137	7.4 GBq

The possession limits for unsealed nuclear substances does not apply to natural uranium and its decay products that are contained in the processing and sampling streams.

There is no possession limit on the number of sealed nuclear sources or radiation devices.

The management of nuclear substances and radiation devices will be evaluated against the following criteria:

4.3.1 Full and accurate records are maintained to show:

- The acquisition of nuclear substances and radiation devices including the quantity received, the form of the substance, and the name of the vendor.
- The inventory of all nuclear substances and radiation devices at the facility.
- The disposition of all nuclear substances and radiation devices acquired for use or processed by the facility, including the name and address of the recipient, a copy of the recipient's licence (if applicable), the quantity of the nuclear substance, and the date of shipment.

4.3.2 Each room, area or enclosure where more than one exemption quantity of an unsealed nuclear substance is used at a single time is classified as a basic level laboratory. The quantity of an unsealed nuclear substance used at a single time shall not exceed 5 Annual Limit of Intake (ALI).

4.3.3 A radioisotope safety poster approved by the Commission or a person authorized by the Commission which corresponds to the classification of the area, room or enclosure is posted, in a readily visible location in areas, rooms or enclosures where nuclear substances are handled.

4.3.4 Non-fixed contamination in all basic level laboratories and associated storage areas does not exceed:

- 3 becquerels per square centimetre for all Class A radionuclides.
- 30 becquerels per square centimetre for all Class B radionuclides.
- 300 becquerels per square centimetre for all Class C radionuclides; averaged over an area not exceeding 100 square centimetres.

4.3.5 When in storage, radioactive nuclear substances or radiation devices are accessible only to persons authorized by the licensee; the dose rate at any occupied location outside the storage area, room or enclosure resulting from the substances or devices in storage does not exceed 2.5 microSv/h and measures are in place to ensure that the dose limits in the *Radiation Protection Regulations* are not exceeded as a result of the substances or devices in storage.

4.3.6 The following conditions are met prior to removing basic level laboratories from use:

a) Non-fixed contamination does not exceed:

   i) 0.3 becquerels per square centimeter for all Class A radionuclides.

   ii) 3 becquerels per square centimeter for all Class B radionuclides.

   iii) 30 becquerels per square centimeter for all Class C radionuclides, averaged over an area not exceeding 100 square centimeters.

b) The release of any area, room or enclosure containing fixed contamination, is approved in writing by the Commission or a person authorized by the Commission.

c) All nuclear substances and radiation devices have been transferred.

d) All radiation warning signs have been removed or defaced.

4.3.7 The dose rate from nuclear substances and devices in areas normally occupied by persons other than Nuclear Energy Workers, does not exceed 2.5 microSv/h.

4.3.8 A durable and legible sign that indicates the name or job title and the telephone number of a person who can initiate the accident procedure that pertains to the radiation device and who can be contacted in case of an emergency 24 hours a day is posted, in readily visible location at the place where any radiation device is used.

4.3.9 Radiation devices are installed, mounted and dismounted in accordance with written procedures.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Radiation Protection Program	Revision 3	November 2012	4036630

Recommendations and Guidance

Guidance on the management of nuclear substances and radiation devices is found in regulatory document CNSC RD/GD-371, *Licence Application Guide Nuclear Substances and Devices*, November 2011.

5 SAFETY ANALYSIS

The Safety and Control Area "Safety Analysis" 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.

5.1 Safety Analysis Program

Licence Condition 5.1

The licensee shall implement and maintain a safety analysis program.

Preamble

This LC requires that the licensee implement and maintain a process to identify and assess hazards and risks on an ongoing basis. This would include identifying and evaluating new or unforeseen risks that were not considered at the planning and design stages and updating previous risk assessments by replacing important assumptions with performance data. The results of this process will be used to set objectives and targets and to develop preventative and protective measures.

At the planning stage of a uranium mining/milling facility or a major change in operation of a facility, an environmental assessment (EA) can be carried out to determine whether the project is

likely to result in a significant adverse effect or poses an unreasonable risk to the environment, taking into consideration the proposed mitigation measures. The EA includes the characterization of the baseline environmental conditions, and assessment of alternative ways of carrying out the project, credible accident scenarios and an environmental risk assessment (ERA) that predicts and risk ranks the potential effects of a project on ecological and human health due to both radiological and hazardous substances.

The ERA also serves as an adaptive management tool to assess the results of the facility's monitoring program to determine whether the impact on the environment and human health is within the bounds of those predicted as a basis for licensing and to assess whether additional mitigation measures are necessary. Additional mitigation measures may be necessary to ensure adequate provision and all reasonable precautions are taken to protect the environment and human health and safety and that the facility does not pose an unreasonable risk to the environment, workers and the public. The ERA should be updated with the monitoring results, and be reviewed periodically to identify and assess any risks that might have emerged or changed, and to verify its applicability.

The EAs listed in Appendix C.2 have been carried out to predict the effects of Cameco's operation at Cigar Lake.

Following the EA, recognized hazard analysis and risk assessment techniques are carried out during the design of systems, components and equipment to identify hazards and risks, and to identify the necessary engineering and administrative mitigation and control measures. Safety analyses are prepared for mine development and waste management facilities. CNSC staff verify that the licensee assesses operating performance against these hazard analyses, risk assessments and safety analyses to ensure that the facility's operation remains within the objective of the licensing basis.

Prior to implementing any significant changes or modifications, the licensee must provide the CNSC with an assessment of the proposed changes or modifications, identification and assessment of potential risks and impacts and proposed mitigation measures.

Compliance Verification Criteria

The Safety Analysis Program will be evaluated against the following principles:

5.1.1 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.

5.1.2 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.

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

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

Environmental risk assessments will be assessed against:

CSA Standard N288.6-12 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills.*

Job hazard assessments that are conducted when planning non-routine and complex work activities are discussed under Operating Performance.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Safety and Health Management Program	Revision 2	December 2012	4064102
CSA	N288.6-12 Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	Version 1 Revision 0	June 2012	N/A

Recommendations and Guidance

There are no recommendations or guidance.

6 PHYSICAL DESIGN

The Safety and Control Area "Physical Design" includes activities that impact on the ability of systems, structures, 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.

6.1 Design Program

Licence Condition 6.1

The licensee shall implement and maintain a design program.

Preamble

This LC requires that the licensee implement and maintain a design control process to ensure that design outputs (both interim and final) are reviewed, verified and validated against the design inputs and performance requirements, and to ensure that the design inputs are selected such that safety, performance and dependability of the design item are achieved.

The licensee is encouraged to make continuous improvements to the design of facilities and equipment, as long as the changes remain within the objective of the licensing basis authorized by the Commission.

The design of mining facilities must adapt to conditions encountered as development of the mine advances. An adaptive design process must be implemented and maintained to ensure that the design meets design criteria. The mine design process must include consideration of geology, hydrogeology, rock mechanics, ventilation, hydrology and water management, waste management including waste rock classification, handling and disposal, risk assessment and the identification and implementation of mitigation measures. Climate change should be considered in the mine design.

Compliance Verification Criteria

The Design Program will be evaluated against the following principles:

6.1.1 The design process is planned, documented and controlled.

6.1.2 The design control process is defined and communicated and is understood by affected personnel.

6.1.3 A design authority responsible for the design control process is designated.

6.1.4 The design control process includes design planning, inputs, output, review, verification, validation, transfer, records and change management.

6.1.5 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.

6.1.6 The design is reviewed by considering design inputs, requirements, experience with similar designs, and the results of research and testing.

6.1.7 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

6.1.8 The facility design and status documents are accurate and accessible to facility personnel.

6.1.9 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.

6.1.10 Procedures have been implemented to ensure that design output information (document and/or data) appropriately and accurately reflect the approved design.

6.1.11 The facility's as-built physical configuration reflects the approved design.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Mining Operations Program	Revision 1	November 2012	4043427
Cameco	Mining Facility Description Manual	Revision 3	January 2013	4069696

Recommendations and Guidance

There are no recommendations or guidance.

7 FITNESS FOR SERVICE

The Safety and Control Area "Fitness for Service" covers activities that are carried out to ensure that the physical condition of systems, components and structures remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

7.1 Maintenance Program

Licence Condition 7.1

The licensee shall implement and maintain a maintenance program.

Preamble

This LC requires that the licensee implement and maintain a maintenance program to ensure that the operating condition of systems, equipment and devices is preserved so that they can perform their function reliably. Accuracy is maintained by planning and carrying out periodic adjustments, calibrations, repairs and replacement.

It is expected that the licensee will conduct routine maintenance, inspection and testing to ensure that the availability, reliability and effectiveness of facilities and equipment that may impact health, safety and protection of the environment.

Compliance Verification Criteria

The Maintenance Program will be assessed against the following principles:

7.1.1 Systems, equipment, and devices are maintained in good working order such that they can perform their design function.

7.1.2 Instruments, controls and associated indicators are maintained in an operational state and are in calibration. The method and interval of calibrations are defined, and records of calibrations are kept.

7.1.3 Preventative and corrective maintenance processes and systems have been implemented and are maintained.

7.1.4 Regular inspection and testing of critical infrastructure and equipment are carried out.

7.1.5 A process has been implemented to identify, plan and schedule maintenance activities.

7.1.6 Maintenance, testing, surveillance and inspection backlogs are monitored and minimized.

7.1.7 Methods are used to show the current acceptance and operating status, and to prevent the use of systems, equipment or devices that are inaccurate or not in working order.

7.1.8 When deviations beyond accuracy limits are found or suspected, their consequence on past results, and on present performance is evaluated.

7.1.9 A process exists to verify that changes to calibration, testing and maintenance requirements due to system and equipment modifications and replacements are implemented.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Maintenance Program	Revision 2	November 2012	4036658

Recommendations and Guidance

There are no recommendations or guidance.

8 RADIATION PROTECTION

The Safety and Control Area "Radiation Protection" 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 and controlled.

8.1 Radiation Protection Program

Licence Condition

The licensee shall implement and maintain a radiation protection program.

Preamble

The *Radiation Protection Regulations* require that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried on. This program must ensure that doses to workers do not exceed prescribed dose limits and are kept ALARA, social and economic factors being taken into account. The regulatory dose limits are explicitly provided in the *Radiation Protection Regulations*.

Compliance Verification Criteria

The Radiation Protection Program will be assessed against the following principles:

8.1.1 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.

8.1.2 Workers, supervisors, contractors, and visitors have the qualifications (knowledge, skills, experience) needed to effectively perform RP practices associated with their work. A re-qualification program is implemented to maintain this qualification.

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

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

8.1.5 RP instrumentation and equipment are calibrated, maintained, and used so that radiation levels are accurately determined.

8.1.6 The Personnel Dosimetry Program ensures that external and internal radiation doses to individuals are accurately determined and recorded.

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

Action Levels (ALs) are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL referred to in a licence is unexpectedly reached, a loss of control of some part of the associated RP Program may have occurred, and specific action is required, as defined in the *Radiation Protection Regulations* and the Radiation Code of Practice. The licensee has identified the effective doses to individuals of 1 mSv in one week and 5 mSv in a quarter as ALs. The weekly AL is assessed against engineering monitoring data. The quarterly AL is assessed against official dosimetry results. The licensee is expected to review and, if necessary, revise the ALs specified above at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to the CNSC.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Radiation Protection Program	Revision 3	November 2012	4036630
Cameco	Radiation Code of Practice	Revision 3	November 2012	4036630

Recommendations and Guidance

Guidance on aspects of radiation protection is provided in the following documents:

- CNSC Regulatory Guide G-129, Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable" (ALARA)
- CNSC Regulatory Guide G-228, Developing and Using Action Levels
- CNSC Regulatory Guide G-91, Ascertaining and Recording Radiation Doses to Individuals
- CNSC Regulatory Guide G-4, Measuring Airborne Radon Progeny at Uranium Mines and Mills
- CNSC Regulatory Standard S-106, Technical and Quality Assurance Requirements for Dosimetry Services in Canada
- CNSC Regulatory Standard S-260, Making Changes to Dose-Related Information Filed with the NDR.

9 CONVENTIONAL HEALTH AND SAFETY

The Safety and Control Area "Conventional Health and Safety" covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.

9.1 Occupational Health and Safety Program

Licence Condition 9.1

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

Preamble

This LC requires that the licensee implement and maintain 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. 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 Occupational Health and Safety Act, 1993* (Chapter O-1.1 of the Statutes of Saskatchewan, 1993) and regulations (including *The Mines Regulations, 2003* Chapter 0-1.1 Reg 2).

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

The CNSC expects uranium mines and mills to develop, implement and maintain an occupational health and safety program to promote a safe and healthy workplace for employees and minimize the incidence of occupational injuries and illnesses.

Compliance Verification Criteria

The Occupational Health and Safety Program will be assessed against the following principles:

9.1.1 The necessary people, materials, equipment, programs and procedures to effectively manage, control and minimize health and safety risks have been provided.

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

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

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

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

9.1.6 Procedures have been established and are maintained to communicate information about conventional health and safety.

9.1.7 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.

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

9.1.9 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.

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

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

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

The selection, use and care of respirators will be evaluated against CSA Standard Z94.4-11, *Selection, Use and Care of Respirators*.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Safety and Health Management Program	Revision 2	December 2012	4064102
CSA	Z94.4-11, Selection, Use and Care of Respirators	2011	2011	N/A

Recommendations and Guidance

There are no recommendations or guidance.

10 ENVIRONMENTAL PROTECTION

The Safety and Control Area "Environmental Protection" covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.

10.1 Environmental Protection Program

Licence Condition 10.1

The licensee shall implement and maintain an environmental protection program.

Preamble

This LC requires that the licensee implement and maintain a program to ensure that environmental protection is managed via an integrated set of documented activities that are designed such that environmental issues are identified, monitored, interpreted and acted upon in a manner that demonstrates "adequate precaution" to protect the environment.

The Environmental Protection Program must include an environmental monitoring program (EMP) that monitors all releases of nuclear and hazardous substances to the environment and characterizes and monitors the quality of the environment associated with a licensed facility. The overall objective of the EMP is to measure the effects of a proposed licensed activity on the receiving environment with respect to the concentrations and quantities of nuclear and hazardous substances in the environment (abiotic and biotic) and/or measurable changes in biological processes. A site-specific ERA shall be used to design the monitoring program such that the EMP can be used to determine whether measurable effects are acceptable.

Compliance Verification Criteria

The Environmental Protection Program will be assessed against:

10.1.1 CNSC Regulatory Policy P-223, *Protection of the Environment*.

10.1.2 CNSC Regulatory Document 2.9.1, Environmental Protection: *Environmental Protection Policies, Programs and Procedures*.

10.1.3 CSA Standard N288.4, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*.

10.1.4 CSA Standard N288.5, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills.*

Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Environmental Code of Practice	Revision 1	September 2013	4200759
CNSC	P-223, Protection of the Environment	February 2001	N/A	N/A
CNSC	CNSC Regulatory Document 2.9.1 Environmental Protection: Environmental Protection Policies, Programs and Procedures.	September 2013	N/A	N/A
CSA	Standard N288.4, Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	2010	N/A	N/A
CSA	Standard N288.5, Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	2011	N/A	N/A

Recommendations and Guidance

Guidance on environmental protection programs is provided through CAN/CSA-ISO 14001:04, *Environmental Management Systems – Requirements with Guidance for Use*.

10.2 Reaching or Exceeding Effluent Discharge Limit

Licence Condition 10.2

The licensee shall where the effluent concentration reaches or exceeds the discharge limits in the *Metal Mining Effluent Regulations*, immediately investigate and take corrective action to ensure that the effluent concentration is maintained below the discharge limits.

Preamble

This LC requires the licensee to investigate and take corrective action if measured parameters in the final treated effluent exceed the authorized effluent discharge limits.

Compliance Verification Criteria

AUTHORIZED EFFLUENT DISCHARGE LIMITS

Deleterious Substance[1,2]	Maximum Authorized Monthly Mean Concentration[3]	Maximum Authorized Concentration in a Composite Sample[3]	Maximum Authorized Concentration in a Grab Sample[3]
Arsenic (mg/L)	0.50	0.75	1.00
Copper (mg/L)	0.30	0.45	0.60
Lead (mg/L)	0.20	0.30	0.40
Nickel (mg/L)	0.50	0.75	1.00
Zinc (mg/L)	0.50	0.75	1.00
Total Suspended Solids (mg/L)	15.00	22.50	30.00
Radium-226 (Bq/L)	0.37	0.74	1.11
Acid balance (as H_3O^+) reported as pH	In a range of 6.0 to 9.5		
Acutely Lethal Effluent[4]	0%		

Notes:

1. Definition of Units: mg/L = milligrams per litre
   Bq/L = Becquerels per litre
2. All concentrations and activities are total values.
3. a) "Monthly Mean Concentration" means the average value of the concentrations in composite or grab samples collected over a calendar month, in accordance with the *Metal Mining Effluent Regulations* (MMER).
   b) "Composite Sample" means:
      i) a quantity of undiluted effluent consisting of a minimum of three equal volumes of effluent, or three volumes proportionate to flow, that has been collected at approximately equal time intervals over a sampling period of not less than 7 hours, and not more than 24 hours, or
      ii) a quantity of undiluted effluent collected continually at an equal rate, or at a rate proportionate to flow, over a sampling period of not less than 7 hours, and not more than 24 hours.
   c) "Grab Sample" means a quantity of undiluted effluent collected at any given time.
4. "Acutely Lethal Effluent" means an effluent at 100% concentration that kills more than 50% of the rainbow trout subjected to it over a 96-hour period when tested in accordance with the acute lethality test.

Action Levels (ALs) are designed to alert licensees before regulatory limits are reached. By definition, if an AL referred to in the LCH is unexpectedly reached, a loss of control of some part of the associated Environmental Protection Program may have occurred, and specific action is required, as defined in the *Uranium Mines and Mills Regulations* and the applicable Environmental Code of Practice (ECOP). Administrative and action levels are defined in the Cigar Lake Operations ECOP and are stated in table below. If the average of ten effluent treatment ponds exceeds an administrative level concentration, then an action level has been reached. Reporting requirement regarding exceedances of action level is described in LC 4.2.

Parameter	Administrative Level Representative Sample
Total Suspended Solids	12.0 mg/L
Molybdenum	1.1 mg/L
Radium-226	0.30 Bq/L
pH	≤ 6.5 or ≥ 8.5

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Environmental Code of Practice	Revision 1	September 2013	4200759

Recommendations and Guidance

There are no recommendations or guidance.

11 EMERGENCY MANAGEMENT AND FIRE PROTECTION

The Safety and Control Area "Emergency Management and Fire Protection" covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. It also includes any results of emergency exercise participation.

11.1 Emergency Management and Fire Protection Program

Licence Condition 11.1

The licensee shall implement and maintain an emergency management and fire protection program.

Preamble

This LC requires that the licensee implement and maintain an emergency management and fire protection program to prepare for and respond to emergency events, including fires, initiating at or impacting the licensed site, and for dealing with both the onsite and offsite effects of such emergencies.

The licensee is required to have documented emergency preparedness plans and emergency response procedures that take into account accident scenarios that could have adverse impacts on the environment and the health and safety of on-site staff and the public. Adequate resources, equipment, training, testing are required to ensure that individuals and organizational units are prepared and have the resources to effectively respond to and deal with emergencies. The program must demonstrate that the emergency management and fire protection activities are planned, coordinated, controlled and integrated to achieve the safety objectives.

Compliance Verification Criteria

The Emergency Management and Fire Protection Program will be assessed against the following principles:

11.1.1 Potential emergency situations are identified.

11.1.2 Pre-incident plans for response to emergencies are developed and are maintained.

11.1.3 Resources, including facilities and equipment required to respond to emergencies are identified and are maintained.

11.1.4 Emergency communication protocols are established and understood.

11.1.5 Organization and responsibilities are identified.

11.1.6 Workers are trained to fulfill duties and responsibilities with respect to emergency management and fire plans and procedures.

11.1.7 Procedures are implemented and maintained to prevent, prepare for, and respond to emergencies.

11.1.8 Response plans are periodically tested.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Emergency Preparedness and Response Program	Revision 2	November 2012	4036659
Cameco	Fire Protection Program	Revision 2	June 2013	4040579

Recommendations and Guidance

Guidance on elements that should be included in the Emergency Management and Fire Protection Program is provided in the following documents:

- CNSC Regulatory Guide G-225, *Emergency Planning at Class 1 Nuclear Facilities and Uranium Mines and Mills*, August 2001
- CNSC Regulatory Document RD-353, *Testing the Implementation of Emergency Measures*, October 2008

12 WASTE MANAGEMENT

The Safety and Control Area "Waste Management" covers internal waste-related programs which form part of the facility's operations up to the point where the waste is removed from the facility. It also covers the planning for decommissioning.

12.1 Waste Management Program

Licence Condition 12.1

The licensee shall implement and maintain a waste management program.

Preamble

This LC requires that the licensee implement a program to collect, treat, process, store, transport or dispose of the wastes that are produced by the licensed activities at the Cigar Lake Operation.

Waste management facilities include:

- Clean waste rock and overburden piles
- Mineralized and non-mineralized waste piles
- Site run-off containment ponds
- Drill core storage areas
- Contaminated industrial waste storage
- Storage and recycling facilities for hazardous wastes
- Landfill for uncontaminated industrial and domestic waste
- Domestic sewage treatment

Compliance Verification Criteria

The Waste Management Program will be assessed against the following principles:

12.1.1 A radioactive waste management program is implemented to control and minimize the volume of radioactive waste.

12.1.2 The volume of waste is minimized by applying the “reduce, reuse, recycle and recover” principle.

12.1.3 Work, including selecting and purchasing environmentally preferable material and equipment, is carried out in a manner that minimizes waste and prevents pollution.

12.1.4 Waste is stored or disposed of in the appropriate manner.

12.1.5 Wastes are managed in a manner that does not compromise reclamation or decommissioning plans.

12.1.6 Management verifies that employees and contractors comply with waste management practices.

12.1.7 The effectiveness of waste management practices is monitored, measured and recorded on a regular basis.

12.1.8 Routine inspections are performed to identify any potential waste management issues and to verify the condition of containment structures and waste management facilities.

12.1.9 The safety of embankments/dams is inspected and reviewed.

12.1.10 Records are kept of the quantities and types of waste generated and the method of disposal or management.

12.1.11 Wastes are managed to control the present and future releases of contaminants to the environment.

12.1.12 Surface water is managed to prevent or minimize the volume that is contaminated.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Environmental Management Program	Revision 3	September 2013	4200759
Cameco	Waste Management Program	Revision 1	November 2012	4040582
CNSC	RD/GD-370, Management of Uranium Mine Waste Rock and Mill Tailings	N/A	March 2012	N/A

Recommendations and Guidance

Guidance on elements that should be included in the Waste Management Program is provided in the following documents:

- CNSC Policy P-290, *Managing Radioactive Waste*
- CNSC RD/GD-370, *Management of Uranium Mine Waste Rock and Mill Tailings*
- CNSC GD-320, *Assessing the Long Term Safety of Radioactive Waste Management*
- Canadian Dam Association, *Canadian Dam Safety Guidelines*

12.2 Preliminary Decommissioning Plan

Licence Condition 12.2

The licensee shall maintain a Preliminary Decommissioning Plan for the facility.

12.3 Financial Guarantee

Licence Condition 12.3

The licensee shall maintain a financial guarantee acceptable to the Commission which shall remain valid and in effect and adequate to fund the Preliminary Decommissioning Plan referenced in licence condition 12.2 of this licence.

Preamble

These LCs require that the licensee maintain a Preliminary Decommissioning Plan (PDP) and financial guarantee which is sufficient to fund the implementation of the PDP.

A PDP provides an overview of the proposed decommissioning approach that is sufficiently detailed to assure that the proposed approach is, in the light of existing knowledge, technically and financially feasible and appropriate in the interests of health, safety, security and the protection of the environment. The PDP defines areas to be decommissioned and the general structure and sequence of the principle work packages. The PDP forms the basis for establishing and maintaining a financial arrangement (financial guarantee) that will assure adequate funding of the decommissioning plan.

The latest revision of the PDP and estimation of the cost of decommissioning were finalized in *Preliminary Decommissioning Plan and Cost Estimate, December 2012.*

Letters of credit payable to the Saskatchewan Ministry of Environment for C$49.2 million are sufficient to fund the estimated cost of implementing the PDP.

Compliance Verification Criteria

It is expected that the PDP will be revised as the conditions at the facility change. When the PDP is revised the cost of decommissioning must be reviewed. At a minimum, the PDP and the value of the financial guarantee must be reassessed every five years, or when requested by the Commission or a person authorized by the Commission.

Revisions of the PDP will be assessed against:

- CSA standard N294-09: *Decommissioning of Facilities Containing Nuclear Substances*
- CNSC Guide Document G-219, *Decommissioning Planning for Licensed Activities*

Proposed changes to the financial guarantee will be assessed against:

- CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities,* June 2000

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	E-Doc
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Preliminary Decommissioning Plan and Cost Estimate	Revision 3	December 2012	4054237
CNSC	G-219, Decommissioning Planning for Licensed Activities	June 2000	N/A	N/A
CNSC	G-206, Financial Guarantees for the Decommissioning of Licensed Activities	June 2000	N/A	N/A
CSA	N294-19, Decommissioning of Facilities Containing Nuclear Substances	2009	N/A	N/A

Recommendations and Guidance

There are no recommendations or guidance.

13 SECURITY

The Safety and Control Area "Security" covers the programs required to implement and support the security requirements stipulated in the regulations, in their licence, or in expectations for their facility or activity.

13.1 Security Program

Licence Condition 13.1

The licensee shall implement and maintain a security program.

Preamble

This LC requires that the licensee implement and maintain security measures to prevent the loss of nuclear substances and prevent acts of sabotage at the facility.

Compliance Verification Criteria

The Security Program will be assessed against the following principles:

13.1.1 The Security Program addresses the risks identified in an industrial security threat and risk assessment.

13.1.2 Measures are implemented and maintained to prevent the loss of nuclear substances or prevent acts of sabotage at the facility.

13.1.3 Measures are taken to prevent unauthorized access to the mining facility and to areas within the facility where nuclear substances are stored.

13.1.4 The industrial security threat and risk assessment is periodically reviewed and updated.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Security Program	Revision 2	November 2012	4037602

Recommendations and Guidance

There are no recommendations or guidance.

14 SAFEGUARDS AND NON-PROLIFERATION

The Safety and Control Area "Safeguards and Non-Proliferation" covers the programs required for the successful implementation of the obligations arising from the Canada/ International Atomic Energy Agency (IAEA) Safeguards Agreement.

14.1 Safeguards and Non-Proliferation Program

Licence Condition 14.1

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

Preamble

This LC requires that the licensee implement a safeguards and non-proliferation program to report on the transfer of nuclear material from the facility, provide the required information on its operations for Canada's annual nuclear fuel cycle declaration to the IAEA and to ensure that IAEA inspectors are granted prompt access to the facility.

Compliance Verification Criteria

The Safeguards and Non-Proliferation Program will be assessed against CNSC Regulatory Document RD-336, *Accounting and Reporting of Nuclear Material* and the following principles:

14.1.1 Reasonable services and assistance are provided to the IAEA to enable the IAEA to carry out its duties and functions.

14.1.2 Prompt access to all locations at the facility is granted to the IAEA at all reasonable times where such access is required for the purposes of carrying on an activity pursuant to a safeguards agreement. Health and safety services and escorts are provided as required in order to facilitate activities.

14.1.3 Records that must be kept or any reports that are required to be made under a safeguards agreement are disclosed to the CNSC and the IAEA.

14.1.4 Reasonable assistance is provided to the IAEA to enable sampling and removal or shipment of samples.

14.1.5 Reasonable assistance is provided to the IAEA to enable measurements, tests and removal or shipment of equipment.

14.1.6 Measures are implemented to prevent damage to, or the theft, loss or sabotage of samples collected pursuant to a safeguards agreement or the illegal use, possession or removal of such samples.

14.1.7 Reports and information, that is required to facilitate Canada's compliance with any applicable safeguards agreement, are provided to the Commission.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Security Program	Revision 2	November 2012	4037602
CNSC	RD-336, *Accounting and Reporting of Nuclear Material*	Edition 1.0	January, 2011	3439822

Recommendations and Guidance

There are no recommendations or guidance.

15 PACKAGING AND TRANSPORT

The Safety and Control Area "Packaging and Transport" covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility.

15.1 Packaging and Transport Program

Licence Condition 15.1

The licensee shall implement and maintain a packaging and transport program.

Preamble

Transport of nuclear substances is subject to the *Transport of Dangerous Goods Regulations* and the *Packaging and the Transport of Nuclear Substances Regulations*.

Cameco packages and ships uranium ore slurry. The slurry containers must meet the regulatory requirements for industrial packages (IP-2) as defined in the *Packaging and Transport of Nuclear Substances Regulations.* In addition, small amounts of nuclear substances and radiation devices, radioactive samples and contaminated equipment are received, packaged and shipped to and from site.

This LC requires the licensee to implement and maintain a packaging and transport program for nuclear substances which include the necessary procedures, materials and equipment to:

- Safely receive and unload packages
- Use, inspect and maintain packaging and packages
- Prepare, consign, handle and load packages

Compliance Verification Criteria

The adequacy of the Packaging and Transport Program will be assessed against the following principles:

15.1.1 All radioactive materials are transported in accordance with applicable regulations and procedures.

15.1.2 Procedures describe requirements for the choice of appropriate packages, preparation of transport documentation, packaging, storage and shipment of nuclear substances.

Documents that Require Version Control

Source	Document Title	Revision	Effective Date	e-DOC
Cameco	Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Cameco	Transportation Program	Revision 2	November 2012	4036649

Recommendations and Guidance

There are no recommendations or guidance.

16 FACILITY SPECIFIC

There are no facility specific requirements.

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APPENDIX A CONTROL OF THE LCH

This appendix describes the administrative processes used to control the LCH, LCH change control procedure, change review criteria, dispute resolution, records management and reporting to the Commission.

A.1 LCH Change Control Process

Only those authorized in Part I, section 1.2 of this LCH have the authority to make changes to the LCH.

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

- Preparation and use of the LCH is properly controlled
- All referenced documents are correctly identified and maintained
- Changes are conducted in accordance with CNSC Regulatory Policy P-299, *Regulatory Fundamentals*
- 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.

Those incumbents identified in Part I, section 1.2 may only consent to the requested change once they have determined that the proposed change will not change the objective of the licensing basis.

The following are examples of proposed changes that require a change to the LCH or a document referenced in the LCH which must be considered by a Delegated Authority:

- Changes to the design and/or operation of facilities, processes and equipment
- Mining of uranium ore from a different source
- Clarification of the compliance verification criteria text to achieve a common understanding between the licensee and CNSC staff
- Changes to the codes, standards and regulatory documents which are identified as compliance verification criteria
- Changes to recommendations and guidance such as inclusion or amendment of CNSC regulatory guidance documents or recommendations

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 *Record of CNSC Staff Review of Proposed Change*
3. Complete a technical review of the proposed change, if required
4. Consult the licensee. In case of disagreement on the proposed change, the dispute resolution process outlined in section A.4 will apply
5. Obtain consent and signature from a Delegated Authority
6. Update the LCH in accordance with the approved *Record of CNSC Staff Review of Proposed Change* and send the updated document to the parties identified on the distribution list (see section A.5)

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

The licensee must provide the CNSC with written notification of a proposed 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 objective 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 regard 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 CEAA, or whether a licence amendment or other licensing action would likely be required
    - Where applicable, the alternatives evaluated and the reasons for selection of the chosen option
    - Any changes to the inventories of nuclear substances on site related to the proposed change
    - The construction, commissioning and operating schedule for the proposed change including hold points or progress reports for regulatory review and approval (as appropriate)
    - Expected impacts, if any, on the proposed decommissioning or closure plans
    - Results of any risk analysis or Hazard and 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-term 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 on-site 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 objective of 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:

- Project Officer, Uranium Mines and Mills Division
- Cameco Corporation

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH during the previous year in their annual report to the Commission.

APPENDIX B GLOSSARY OF TERMS

B.1 Acronyms

The following is the list of acronyms used in this document:

ALARA	As Low As Reasonably Achievable, social and economic factors taken into consideration
AL	Action Level
ALI	Annual Limit of Intake
CEAA	*Canadian Environmental Assessment Act*
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DCR	Document Change Request
DNCFR	Directorate of Nuclear Cycle and Facilities Regulation
LC	Licence Condition
LCH	Licence Conditions Handbook
NSCA	*Nuclear Safety and Control Act*
PDP	Preliminary Decommissioning Plan
RP	Radiation Protection
SAT	Systematic Approach to Training
SCA	Safety and Control Area
UML	Uranium Mines Licence
UMMD	Uranium Mines and Mills Division

B.2 Definitions

The following are definitions for words or expressions used in this document. Unless a source is provided in parenthesis, the words or expressions have been defined for the purposes of this document.

Accept/ed/able/ance

Meets regulatory requirements, which means it is in compliance with regulatory documents or technical standards referenced in the licence.

Accepted Items

The term “accepted items” refers to systems, equipment and facilities, as well as other items required for licensed activities. Changes to these other items also need to be controlled; examples are electrical cables, relays, water treatment chemicals, ventilation filters, etc.

Classes of Nuclear Substances

The following table organizes a number of common nuclear substances, including those for which surface contamination and waste disposal limits are typically incorporated into CNSC licences, into three classes (Class A, Class B, or Class C) on the basis of common radiological characteristics.

Class	Radionuclide				
Class A	All alpha emitters and their daughter isotopes			Ag-110m	Ar-41
	C-11	Co-56	Co-60	F-18	Ga-68
	Ga-72	I-124	La-140	Mn-56	N-13
	Na-22	Na-24	Nb-98	O-15	Sb-124
	Ta-182	V-48	Y-86	Zn-65	
Class B	As-74	Au-198	Ba-133	Br-82	Co-58
	Cu-64	Fe-59	Ga-67	Gd-153	Hg-194
	Hg-203	I-131	In-111	In-113m	In-114m
	Ir-192	K-42	Kr-79	Kr-81m	Nb-95
	Pa-233	Rb-84	Rb-86	Ru-103	Sc-46
	Se-75	Sm-153	Sn-123	Sr-85	Sr-90
	Xe-127				
Class C	Au-195m	C-14	Ca-45	Cd-109	Ce-141
	Ce-144	Cl-36	Co-57	Cr-51	Fe-55
	Ge-68	H-3	I-123	I-125	In-114
	Kr-85	Lu-177	Ni-63	P-32	P-33
	Re-186	Re-188	S-35	Sn-113	Sr-89
	Tc-99	Tc-99m	Tl-201	V-49	W-188
	Xe-133	Y-86	Y-90	Yb-169	

Compliance Verification Criteria

Compliance Verification Criteria are measures of conformity to the regulatory requirements. CNSC staff use these criteria to confirm that the licensee is meeting the corresponding LC.

Consent

Permission to proceed, given by the CNSC delegated authority, for situations or changes where the licensee would:

- Comply with a regulatory requirements set out in applicable laws and regulations
- Comply with a LC
- Not adversely impact the licensing basis

Design Basis

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.

Licensee-Produced Licensing Documents

Documents containing the safety and control measures described in the licence application and the documents needed to support that licence application.

Licensing Basis

The Licensing Basis for a regulated facility or activity is a set of requirements and documents comprising:

- The regulatory requirements set out in the applicable laws and regulations
- The conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence
- The safety and control measures described in the licence application and the documents needed to support that licence application

Material Violation

A "material violation" is a violation of applicable law at the federal, provincial or municipal level that pertain to the activities authorized by this licence that impacts the ability of a licensee to carry out its licensed activities in a way that takes into consideration the protection of the environment, health and safety of persons, maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Person Authorized by the Commission

For the purpose of the UML and LCH, it means CNSC staff fulfilling the following positions:

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

Program(s)

A documented group of planned activities, procedures, processes, standards and instructions coordinated to meet a specific purpose.

Written Notification

A physical or electronic communication between a CNSC delegated authority and a person authorized to act on behalf of the licensee.

Written Notification Prior to Implementation

The CNSC must receive the written notification for the proposed changes within a reasonable time prior to the implementation. This will allow sufficient time for CNSC staff to review the submission and determine the acceptability.

APPENDIX C LICENSEE DOCUMENTS

C.1 Documents that require notification of changes

In accordance with the requirements of LC 1.3 the CNSC must be provided with written notification before significant changes may be made to the following documents:

Document Title	Revision	Effective Date	e-DOC
Emergency Preparedness and Response Program	Revision 2	November 2012	4036659
Environmental Code of Practice	Revision 1	September 2013	4200759
Environmental Management Program	Revision 3	September 2013	4200759
Fire Protection Program	Revision 2	June 2013	4040579
Maintenance Program	Revision 2	November 2012	4036658
Mine Ventilation Code of Practice	Revision 5	October 2013	4224647
Mining Facility Licensing Manual	Revision 9	October 2012	4026013
Mining Facility Description Manual	Revision 3	January 2013	4069696
Mining Operations Program	Revision 1	November 2012	4043427
Preliminary Decommissioning Plan and Financial Assurance	Revision 3	December 2012	4054237
Processing Operations Program	Revision 1	November 2012	4036654
Public Information Program	Revision 2	December 2012	4052377
Quality Management Program	Revision 2	November 2012	4043422
Radiation Code of Practice	Revision 3	November 2012	4036630
Radiation Protection Program	Revision 3	November 2012	4036630
Safety and Health Management Program	Revision 2	December 2012	4064102
Security Program	Revision 2	November 2012	4037602
Training Development Program	Revision 2	November 2012	4040583
Transportation Program	Revision 2	November 2012	4036649

Document Title	Revision	Effective Date	e-DOC
Waste Management Program	Revision 1	November 2012	4040582

C.2 Documents describing the objective of the licensing basis

The objective of the licensing basis is to achieve the level of protection of the health, safety, and security of the public and workers, and the protection of the environment that were identified in environmental and human health risk assessments that were carried out in support of the licence application. These risk assessments are contained in the following documents:

Document Title	e-DOC
Cigar Lake Mining Corporation: Environmental Impact Statement 1995	518327
COGEMA Resources Inc. and Cigar Lake Mining Corporation Disposal of Cigar Lake Waste Rock, Environmental Impact Statement, COGEMA and Cigar Lake Mining Corporation, 2001	1037776
Cameco Corporation 2004. Cigar Lake Project: Construction, Operation, and Decommissioning Environment Assessment Study Report.	1034719
Cameco Corporation 2005. Cigar Lake Project: Environmental Assessment Follow-up Monitoring Program.	1240932
Cameco Corporation May 2011. Cigar Lake Project: Revised Mine Plan	3727239
Cameco Corporation June 2011. Cigar Lake Project: Addendum to Mine Plan – Third Party Review	3744768
Cameco Corporation July 2011. Cigar Lake Project: Addendum to Mine Plan – Hold Point and Design Changes	3754121
Cameco Corporation July 2013. Cigar Lake Project: Addendum 3 to the May 2011 Mine Plan	4169517
Cameco Corporation 2012. Cigar Lake: Licence renewal to allow operations and ore slurry transport	3965758
Cameco Corporation 2010. Cigar Lake Water Management Project – Environmental Impact Statement	3675517

APPENDIX D LIST OF DOCUMENTS USED AS GUIDANCE OR CRITERIA

D.1 Canadian Standards Association documents referenced in the LCH

Document	Document Title	Version	LC	e-DOC
CAN/CSA N288.6-12	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	2012	5.1	3974647
CAN/CSA Z94.4-11	Selection, Use and Care of Respirators	2011	9.1	N/A
CAN/CSA N288.4	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	2010	10.1	N/A
CAN/CSA N288.5	Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	2011	10.1	N/A
CAN/CSA N294.09	Decommissioning of Facilities Containing Nuclear Substances	2009	12.3	N/A

D.2 CNSC documents referenced in the LCH

Document	Document Title	Version	L.C.	e-DOC
INFO-0795	Licensing Basis		1.1	N/A
RD/GD-99.3	Public Information and Disclosure	March 2012	1.5	N/A
HPD-TPE-01	Objectives and Criteria for Regulatory Evaluation of Nuclear Facility Training Programs, Human Performance Division, Directorate of Assessment and Analysis	February 2005	3.1	3664038
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements	August 2010	4.2	3678482
RD/GD-371	Licence Application Guide Nuclear Substances and Radiation Devices.	November 2011	4.3	N/A
G-228	Developing and Using Action Levels	March 2001	8.1	N/A
G-218	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	November 2003	8.1	N/A
G-129	Keeping Radiation Exposures and Doses ALARA	October 2004	8.1	N/A
S-106	Technical and Quality Assurance Requirements for Dosimetry Services in Canada	May 2006	8.1	N/A
G-91	Ascertaining and Recording Radiation Doses to Individuals	June 2003	8.1	N/A
G-4	Measuring Airborne Radon Progeny at Uranium Mines and Mills	June 2003	8.1	N/A
P-223	Protection of the Environment	July 2004	10.1	N/A

Document	Document Title	Version	L.C.	e-DOC
REGDOC 2.9.1	Environmental Protection: Environmental Protection Policies, Programs and Procedures.	September 2013	10.1	N/A
G-219	Regulatory Guide, Decommissioning Planning for Licensed Activities, issued June 2000	June 2000	10.1	N/A
G-225	Emergency Planning at Class 1 Nuclear Facilities and Uranium Mines and Mills	2003	11.1	N/A
RD-353	Testing the Implementation of Emergency Measures	October 2008	11.1	N/A
P-290	Managing Radioactive Waste	July 2004	12.1	N/A
RD/GD-370	Management of Uranium Mine Waste Rock and Mill Tailings	March 2012	12.1	N/A
G-320	Assessing the Long Term Safety of Radioactive Waste Management	December 2006	12.1	N/A
G-206	Regulatory Guide, Financial Guarantees for the Decommissioning of Licensed Activities, issued June 2000.	June 2000	12.3	N/A
SRP-2.01-SP	Site Selection Threat and Risk Assessment	October 2008	13.1	3250457
RD-336	Accounting and Reporting of Nuclear Material	January 2011	14.1	3439822
G-314	Implementation of Radiation Protection Programs by Consignors, Carriers and Consignees of Radioactive Material	March 2004	15.1	N/A
P-299	Regulatory Fundamentals	April 2005	All	N/A
G-221	A Guide to Ventilation Requirements for Uranium Mines and Mills	June 2003	4.1	N/A

APPENDIX E RESOLUTION OF CONFLICTS OR INCONSISTENCIES

LC	Subject of Conflict or Inconsistency	e-DOC	Identifier	Approved Date

PROPOSED LICENCE CONDITIONS HANDBOOK

e-Doc 6274206 (Word)

e-Doc 6286325 (PDF)

Canada's Nuclear Regulator

DRAFT

e-Doc 6274206 (Word)
e-Doc 6286325 (PDF)

LICENCE CONDITIONS HANDBOOK

LCH-MINE-CIGAR.01/2021

CIGAR LAKE OPERATION
URANIUM MINE LICENCE

UML-MINE-CIGAR.01/2021

Revision 2

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire
Canada

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Licence Conditions Handbook **Effective: October 5, 2020**

LCH-MINE-CIGAR.01/2021, Revision 2

Cigar Lake Operation

Uranium Mine Licence

UML-MINE-CIGAR.01/2021
(Effective: Month XX, 20XX)

SIGNED at OTTAWA this _____ day of _____, 2020

_____

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 #
	0	N/A	Original document	4056563 (Word) 4068688 (PDF)
January 23, 2014	1	1.2, 1.3, 4.1, 4.3, 10.2, 14.1, Appendix A & C	Formatting changes, updated text on delegation of authority for consistency between UMM LCH's, updated text on reporting for consistency, updated references, added table of radiation devices	4170399 (Word) 4068688 (PDF)
October 5, 2020	2	All	Licence and LCH modernization: new standard licence conditions and updated LCH text and format. Revised financial guarantee value. Added Letter of Credit to list of Documents requiring notification of change.	6274206 (Word) 6286325 (PDF)

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TABLE OF CONTENTS

PART I: INTRODUCTION

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

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

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

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

PART II: FRAMEWORK FOR EACH CONDITION

G. GENERAL

G.1 Licensing Basis for Licensed Activities

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

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

(ii) the conditions and safety 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 (hereafter "the Commission").

Preamble

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

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

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

- *Nuclear Safety and Control Act*
- *Uranium Mines and Mills Regulations*
- *Radiation Protection Regulations*
- *Packaging and Transport of Nuclear Substances Regulations, 2015*
- *Nuclear Substances and Radiation Devices Regulations*
- *Metal and Diamond Mining Effluent Regulations*
- Canada/International Atomic Energy Agency (IAEA) Safeguards Agreements

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.

The CNSC licence authorizes Cameco Corporation (Cameco) to conduct the following undertakings at the Cigar Lake Operation, for which the CNSC provides regulatory oversight:

- operation and changes to the underground mine, underground ore-processing facility and surface ore load-out facility
- transfer, by use of a surface load-out system, the treated uranium ore to another facility authorized by the CNSC to accept the nuclear substance
- mining up to 7.0 million kilograms of uranium per year, with a production flexibility up to 9.25 million kilograms of uranium per year
- operation and changes to the dewatering and water management systems, including water treatment plant
- disposal of contaminated wastes, including off-site
- storage of clean and special-waste rock
- authorized decommissioning and reclamation
- handling and storage of hazardous materials and disposal of hazardous wastes, including disposal off site
- possession, storage, transfer, importation, use and disposal of nuclear substances and radiation devices.

Environmental assessments first carried out in 1995 and most recently in 2017 have evaluated the environmental effects from Cameco's operation at Cigar Lake at an annual production rate up to 7.0 million kilograms of uranium. Production flexibility allows the licensee to recoup production shortfalls experienced throughout the mine operation. An increase above the authorized annual production rate of 7.0 million kilograms of uranium per year, or above the production flexibility of 9.25 million kilograms of uranium per year would need to be reviewed by CNSC staff.

Compliance Verification Criteria

Licensing Basis Documents

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

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

GENERAL

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 3.2 of this LCH.

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

Guidance

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

G.2 Notification of Changes

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

Preamble

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

Appendix B provides a list of licensee documents that require notification of change. CNSC staff track the current version of these documents in a document separate from the LCH (e-Doc 6339027).

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 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 prior written notification. It remains the responsibility of the licensee to ensure that the Cigar Lake Operation continues to operate within the bounds of the licensing basis.

Prior written notification shall include:

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

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

Guidance

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

G.3 Financial Guarantee

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

Preamble

The licensee is responsible for all costs of implementing the proposed decommissioning plan (see LC 11.2) and providing an appropriate financial guarantee that is acceptable to the Commission (see LC G.3).

Cameco Corporation maintains a financial guarantee to cover the future decommissioning of the Cigar Lake Operation, and the long term management of radioactive waste generated during operation and decommissioning. The latest revision of the preliminary decommissioning plan (PDP) and estimation of the cost of decommissioning were finalized in Cameco's *Preliminary Decommissioning Plan and Cost Estimate*, June 12, 2019.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of facilities containing nuclear substances	N294-09

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Preliminary Decommissioning Plan and Cost Estimate	5329312	Yes
Cameco	Letter(s) of Credit		Yes

Letters of Credit

	Value ($CDN)
Cameco	$13,856,925
	$10,755,375
Orano	$1,561,910
	$16,691,290
Idemitsu	$3,874,500
TEPCO	$2,460,000
Total	$49,200,000

The financial guarantee for decommissioning the Cigar Lake Operation shall be reviewed and revised by the licensee every five years, or when requested by the Commission. A review should also be conducted following a revision of the Preliminary Decommissioning Plan or Preliminary Cost Estimate that significantly impacts the financial guarantee.

The next financial guarantee update is due in 2022.

The licensee shall submit annually to the Commission, a written report confirming that the financial instruments for decommissioning costs continue to meet the guidance specified in guidance document G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*. The licensee shall submit this report by the end of March of each year, or at the request of the Commission.

Guidance

Guidance Publications

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

G.4 Public Information and Disclosure

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

Preamble

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

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Public Information and Disclosure	RD/GD-99.3

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Public Information Program	4052377	Yes

Guidance

There is no guidance provided for this licence condition.

1. MANAGEMENT SYSTEM

Licence Condition 1.1

The licensee shall implement and maintain a management system.

Preamble

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

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management system requirements for nuclear facilities (except sections identified under other license conditions)	N286-12
CNSC	Safety Culture* (section 2)	REGDOC-2.1.2

* Elements relating to security culture will not be implemented until 2022.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Quality Management Program	4043422	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Safety Culture (excluding section 2)	REGDOC-2.1.2

2. HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1

The licensee shall implement and maintain a training program.

Preamble

The "human performance management" safety and control area covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee workers are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely perform their duties.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Training Development Program	4040583	Yes

The human performance management program will be evaluated against the following principles:

2.1.1 A training system is implemented and maintained to ensure that training programs are systematically defined, designed, developed, implemented, evaluated, recorded and managed.

2.1.2 A training system is implemented and maintained to provide a logical progression from an analysis of the training requirements and identification of the qualifications and competencies required for performing a job, to the design, development, implementation, evaluation and management of training. This includes the respective training materials, and the subsequent evaluation and continuous improvement of the training courses and training programs.

2.1.3 All performance requirements of a capability, job or duty are identified by conducting a job analysis to determine all of the tasks, subtasks and task elements involved.

2.1.4 The necessary general worker training, initial job training and continuing training requirements for workers, based on a task analysis of the knowledge, skills, abilities and attitudes required to perform the duties of their position are defined and documented.

2.1.5 Appropriate training is designed, developed and implemented to meet the qualification and competency requirements.

2.1.6 Trainers meet and maintain documented qualification and competency requirements, particularly in the areas of subject matter expertise and instructional skills.

2.1.7 Formal evaluations confirm and document that each trained worker is qualified and competent to perform the duties of his or her position.

2.1.8 The change management process identifies required training and modifications to the training programs.

2.1.9 Continuing training that includes updates to training programs stemming from the change management process is provided to workers.

2.1.10 The results of periodic training program evaluations are incorporated into training program improvements.

2.1.11 Workers are trained in current procedures and in relevant system and equipment configurations and are competent to perform the duties of their position.

2.1.12 Workers training and qualifications records are established and maintained.

2.1.13 Workers have a level of training related to nuclear safety including but not limited to radiation safety, on-site emergency arrangements, conventional health and safety and environmental protection corresponding to the duties of their position and employment.

Guidance

There is no guidance provided for this licence condition.

3. OPERATING PERFORMANCE

Licence Condition 3.1

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

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management system requirements for nuclear facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Mine Facility Description Manual	4069696	Yes
Cameco	Quality Management Program	4043422	Yes
Cameco	Environmental Code of Practice (Appendix A of the Environmental Management Program – Code of Practice)	4200759	Yes
Cameco	Radiation Code of Practice (Appendix 4 of Radiation Protection Program – Code of Practice)	4036630	Yes
Cameco	Waste Management Program	4040582	Yes
Cameco	Mining Operations Program	4043427	Yes
Cameco	Process Operations Program	4036654	Yes
Cameco	Mine Ventilation Code of Practice	4224647	Yes

Guidance

There is no guidance provided for this licence condition.

Licence Condition 3.2

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

Preamble

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

Compliance Verification Criteria

Licensing Basis Publications

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

The licensee shall report effluent concentrations that reach or exceed the discharge limits in the *Metal and Diamond Mining Effluent Regulations* in addition to requirements outlined in REGDOC-3.1.2.

The licensee shall submit to the CNSC within 90 days after the end of each quarter of a calendar year, the results of the:

- radiation monitoring program
- environmental monitoring program

Results from the above monitoring programs are also to include quality assurance and quality control information. More frequent reporting may be requested on a case-by-case basis.

The licensee shall issue worker radiation dose records within 90 days after the end of each quarter of a calendar year, to:

- the worker
- the CNSC
- the National Dose Registry (NDR)

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

Guidance

Guidance Publications

Source	Document Title	CNSC e-Access Document Number
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010	3678482

Licence Condition 3.3

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

Preamble

Licensees must receive CNSC approval before the import, possession, use, storage, transfer, or disposal of nuclear substances and radiation devices.

The possession limits for unsealed nuclear substances does not apply to natural uranium and its decay products which originate in the mining or ore-treatment streams.

It is also important to note that there is no possession limit on the number of sealed nuclear sources or radiation devices.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Licence Application Guide: Nuclear Substances and Radiation Devices (excluding section 2)	REGDOC-1.6.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Radiation Protection Program (Appendix 3 – Authorized Nuclear Substance List)	4036630	Yes

The authorized possession limits for unsealed nuclear substances are:

Nuclear Substance	Maximum Total Quantity in Possession
Barium-133	4 MBq
Radium-226	0.4 MBq

The maximum authorized quantity of nuclear substances per sealed source is:

Nuclear Substance	Maximum Quantity per Sealed Source
Americium-241	0.037 MBq
Cesium-137	7.4 GBq
Cobalt-60	3.7 MBq
Curium-244	0.037 MBq
Plutonium-238	0.037 MBq
Radium-226	0.037 MBq
Strontium-90	0.037MBq
Thorium-230	0.037 MBq
Thallium-204	3.7 MBq
Uranium-238	5 kBq

The authorized make and model of radiation devices and the maximum quantity of nuclear substance per each device are:

Radiation Device Make and Model	Nuclear Substance	Maximum Quantity per Radiation Device
Ronan Engineering - SA-1	Cesium-137	7.4 GBq
Mount Sopris - LLP-2676	Americium 241/Be	111 GBq

Note: Includes provision for replacement sources for these radiation devices.

The management of nuclear substances and radiation devices will be evaluated against:

3.3.1 A radioisotope safety poster approved by the Commission or a person authorized by the Commission, which corresponds to the classification of the area, room or enclosure, is posted in a readily visible location in areas, rooms or enclosures where these listed nuclear substances are handled.

3.3.2 When in storage, radioactive nuclear substances or radiation devices are accessible only to persons authorized by the licensee; the dose rate at any occupied location outside the storage area, room or enclosure resulting from the substances or devices in storage does not exceed 2.5 mSv/h and measures are in place to ensure that the dose limits in the *Radiation Protection Regulations* are not exceeded as a result of the substances or devices in storage.

Guidance

There is no guidance provided for this licence condition.

4. SAFETY ANALYSIS

Licence Condition 4.1

The licensee shall implement and maintain a safety analysis program.

Preamble

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

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Environmental Management Program	4200759	Yes
Cameco	Waste Management Program	4040582	Yes
Cameco	Safety and Health Management Program	4064102	Yes

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

4.1.1 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.

4.1.2 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.

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

4.1.4 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

5. PHYSICAL DESIGN

Licence Condition 5.1

The licensee shall implement and maintain a design program.

Preamble

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

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

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Design of Uranium Mines and Mills: Ventilation Systems*	REGDOC-2.5.4
CSA Group	Management system requirements for nuclear facilities	N286-12

* Applicable when applying for a CNSC licence to prepare a site for and construct, operate or decommission a uranium mine or mill.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Mining Facility Description Manual	4069696	Yes
Cameco	Quality Management Program	4043422	Yes
Cameco	Mining Operations Program	4043427	Yes
Cameco	Process Operation Program	4036654	Yes

Guidance

There is no guidance provided for this licence condition.

6. FITNESS FOR SERVICE

Licence Condition 6.1

The licensee shall implement and maintain a fitness for service program.

Preamble

The "fitness for service" safety and control area covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that ensure equipment is available to perform its intended design function when called upon to do so.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management system requirements for nuclear facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Maintenance Program	4036658	Yes

The fitness for service program will also be assessed against:

6.1.1 Systems, equipment, and devices are maintained in good working order such that they can perform their design function.

6.1.2 Instruments, controls and associated indicators are maintained operational and in calibration. Method and interval of calibrations are defined, and records of calibrations are kept.

6.1.3 Preventative and corrective maintenance processes and systems have been implemented and are maintained.

6.1.4 Regular inspection and testing of critical infrastructure and equipment are carried out.

6.1.5 A process has been implemented to identify, plan and schedule maintenance activities.

6.1.6 Maintenance, testing, surveillance and inspection backlogs are monitored and minimized.

6.1.7 Methods are used to show the current acceptance and operating status, and to prevent the use of systems, equipment or devices that are inaccurate, uncalibrated or not in working order.

6.1.8 When deviations beyond accuracy limits are found or suspected, their consequence on past results, and on present performance is evaluated.

6.1.9 A process exists to verify that changes to calibration, testing and maintenance requirements due to system and equipment modifications and replacements are implemented.

Guidance

There is no guidance provided for this licence condition.

7. RADIATION PROTECTION

Licence Condition 7.1

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

Preamble

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

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Radiation Protection Program	4036630	Yes

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

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

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

7.1.3 The personal dosimetry program ensures that external and internal radiation doses to individuals are accurately determined and recorded.

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

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

Action levels (AL) are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL referred to in a licence is reached, a loss of control of some part of the associated RP program may have occurred and specific action is required, as defined in the *Radiation Protection Regulations*, the licence and the applicable code of practice.

Action Level	Dose (mSv)
Weekly Action Level	1
Quarterly Action Level	5

The weekly AL is assessed against official dosimetry results or engineering monitoring data. The quarterly AL is assessed against official dosimetry results. The licensee is expected to review and, if necessary, revise the ALs specified above at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to the CNSC.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Measuring Airborne Radon Progeny at Uranium Mines and Mills	G-4
CNSC	Ascertaining and Recording Radiation Doses to Individuals	G-91
CNSC	Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"	G-129
CNSC	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218
CNSC	Developing and Using Action Levels	G-228
CNSC	Technical and Quality Assurance Requirements for Dosimetry Services	S-106
CNSC	Making Changes to Dose-Related Information Filed with the National Dose Registry	S-260

8. CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1

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

Preamble

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

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

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

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Safety and Health Management Program	4064102	Yes

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

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

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

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

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

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

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

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

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

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

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

Guidance

There is no guidance provided for this licence condition.

9. ENVIRONMENTAL PROTECTION

Licence Condition 9.1

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within 24 hours.

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 Protection Policies, Programs and Procedures	RD-2.9.1
CSA Group	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	N288.4-10
CSA Group	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	N288.5-11
CSA Group	Environmental risk assessments at Class I nuclear facilities and uranium mines and mills	N288.6-12
CSA Group	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	N288.7-15
CSA Group	Establishing and implementing action levels for releases to the environment from nuclear facilities	N288.8-17

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Environmental Management Program	4200759	Yes
Cameco	Waste Management Program	4040582	Yes
Cameco	Cigar Lake Human Health and Environmental Risk Assessment (2017) and Addendum (2019)	5357937 5908811	Yes

To ensure the applicable environmental protection measures have been established, implemented and maintained, the environmental protection program will also be assessed against:

9.1.1 Action levels specified in the environmental code of practice. When the licensee becomes aware that an action level has been triggered, the licensee shall notify the Commission within 24 hours and take specific action as defined in the *Uranium Mines and Mills Regulations* and the environmental code of practice.

9.1.2 The authorized release limits as specified below. When the licensee becomes aware that an authorized release limit has been reached or exceeded, the licensee shall immediately notify the Commission, investigate and take corrective action to ensure that the releases are maintained below the authorized release limits.

The authorized liquid effluent release limits until May 31, 2021 are:

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic (mg/L)	0.50	0.75	1.00
Copper (mg/L)	0.30	0.45	0.60
Lead (mg/L)	0.20	0.30	0.40
Nickel (mg/L)	0.50	0.75	1.00
Zinc (mg/L)	0.50	0.75	1.00
Total Suspended Solids (mg/L)	15.00	22.50	30.00
Radium-226 (Bq/L)	0.37	0.74	1.11

Acid balance (as H_3O^+) reported as pH	In a range of 6.0 to 9.5

Acutely Lethal Effluent	0%

Note: In accordance with the *Metal and Diamond Mining Effluent Regulations*, these are the current limits for the Cigar Lake Operation until May 31, 2021.

The authorized liquid effluent release limits after May 31, 2021 are:

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic (mg/L)	0.30	0.45	0.60
Copper (mg/L)	0.30	0.45	0.60
Lead (mg/L)	0.10	0.15	0.20
Nickel (mg/L)	0.50	0.75	1.00
Zinc (mg/L)	0.50	0.75	1.00
Un-ionized ammonia (mg/L)	0.50	N/A	1.00
Total Suspended Solids (mg/L)	15.00	22.50	30.00
Radium-226 (Bq/L)	0.37	0.74	1.11

Acid balance (as H_3O^+) reported as pH	In a range of 6.0 to 9.5

Acutely Lethal Effluent	0%

Note: In accordance with the *Metal and Diamond Mining Effluent Regulations,* these limits will come into effect on June 1, 2021.

Notes:

1) Authorized release limits have been harmonized, where available, with those required under the *Metal and Diamond Mining Effluent Regulations* (MDMER).

2) Definition of Units: mg/L = milligrams per litre
Bq/L = becquerels per litre

3) All concentrations and activities are total values.

4) "Monthly mean concentration" means the average value of the concentrations measured in all composite or grab samples collected from the final discharge point during each month when liquid effluent is released.

5) "Composite sample" means:
   i) a quantity of effluent consisting of not less than three equal volumes or three volumes proportionate to flow that have been collected at approximately equal time intervals over a period of not less than seven hours and not more than 24 hours; or
   ii) a quantity of effluent collected continuously at a constant rate or at a rate proportionate to the rate of flow of the effluent over a sampling period of not less than seven hours and not more than 24 hours.

6) "Grab sample" means a quantity of undiluted effluent collected at any given time.

7) "Acutely lethal effluent" means an effluent at 100 percent concentration that kills more than 50 percent of the rainbow trout subjected to it over a 96-hour period when tested in accordance with the acute lethality test.

ENVIRONMENTAL PROTECTION

Guidance

Guidance Publications

Source	Document Title	Document Number
CSA Group	Environmental management systems – requirements with guidance for use	ISO 14001:2015

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1

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 Version 2*	REGDOC-2.10.1

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

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Emergency Preparedness and Response Program	4036659	Yes

The emergency management and fire protection program will be assessed against the following principles:

10.1.1 Potential emergency situations are identified.

10.1.2 Pre-incident plans for response to emergencies are developed and are maintained.

10.1.3 Resources, including facilities and equipment required to respond to emergencies are identified and maintained.

10.1.4 Emergency communication protocols are established and understood.

10.1.5 Organization and responsibilities are identified.

10.1.6 Workers are trained to fulfill duties and responsibilities with respect to emergency management and fire plans and procedures.

10.1.7 Procedures are implemented and maintained to prevent, prepare for, and respond to emergencies.

10.1.8 Response plans are periodically tested.

Guidance

There is no guidance provided for this licence condition.

Licence Condition 10.2

The licensee shall implement and maintain a fire protection program.

Preamble

Licensees are required to implement and maintain a fire protection program (a set of planned, coordinated, controlled and documented activities) to ensure that the licensed activities do not result in an unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Fire Protection Program	4040579	Yes

Guidance

There is no guidance provided for this licence condition.

11. WASTE MANAGEMENT

Licence Condition 11.1

The licensee shall implement and maintain a waste management program.

Preamble

The "waste management" safety and control area covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility.

Waste management facilities at the Cigar Lake Operation include:

- clean waste rock and overburden piles
- mineralized and non-mineralized waste piles
- site run-off containment ponds
- drill core storage areas
- contaminated industrial waste storage
- storage and recycling facilities for hazardous wastes
- landfill for uncontaminated industrial and domestic waste
- domestic sewage treatment.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings*	REGDOC-2.11.1

* Applicable to new uranium mine or mill projects and/or new waste management facilities at existing uranium mines and mills.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Waste Management Program	4040582	Yes

The waste management program will be assessed against the following principles:

11.1.1 A radioactive waste management program is implemented to control and minimize the volume of radioactive waste.

11.1.2 The volume of waste is minimized by applying the "reduce, reuse, recycle and recover" principle.

11.1.3 Work is carried out in a manner that minimizes waste and prevents pollution.

11.1.4 Waste is stored or disposed of in the appropriate manner.

11.1.5 Wastes are managed in a manner that does not compromise reclamation or decommissioning plans.

11.1.6 The effectiveness of waste management practices is monitored, measured and recorded on a regular basis.

11.1.7 Routine inspections are performed to identify any potential waste management issues and to verify the condition of containment structures and waste management facilities.

11.1.8 The safety of embankments/dams is inspected and evaluated.

11.1.9 Records are kept of the quantities and types of waste generated and the method of disposal or management.

11.1.10 Wastes are managed to control the present and future releases of contaminants to the environment.

11.1.11 Surface water is managed to prevent or minimize the volume that is contaminated.

Guidance

Guidance Publications

Source	Document Title	Document Number
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A

Licence Condition 11.2

The licensee shall maintain a decommissioning plan.

Preamble

This LC requires that the licensee maintain a preliminary decommissioning plan (PDP).

A PDP provides an overview of the proposed decommissioning approach that is sufficiently detailed to assure that the proposed approach is, in the light of existing knowledge, technically and financially feasible, and appropriate in the interests of health, safety, security and the protection of the environment. The PDP defines areas to be decommissioned and the general structure and sequence of the principle work packages. The PDP forms the basis for establishing and maintaining a financial arrangement (financial guarantee) that will assure adequate funding of the decommissioning plan.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of facilities containing nuclear substances	N294-09

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Preliminary Decommissioning Plan and Cost Estimate	5329312	Yes
Cameco	List of the Letter(s) of Credit		Yes

Letters of Credit

	Value ($CDN)
Cameco	$13,856,925
	$10,755,375
Orano	$1,561,910
	$16,691,290
Idemitsu	$3,874,500
TEPCO	$2,460,000
Total	$49,200,000

The PDP is to be revised at a minimum every five years or when required by the Commission; however, is to be kept current to reflect any changes in the site or nuclear facility. The Cigar Lake Operation PDP was initially submitted to the CNSC in 2017 and finalized in 2019. The Cigar Lake PDP is next scheduled for submission to the CNSC in 2022, at which time it will be reviewed against the current version of the CSA Group Standard.

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

12. SECURITY

Licence Condition 12.1

The licensee shall implement and maintain a security program.

Preamble

The "security" safety and control area covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Security Program	4037602	Yes

The security program will be assessed against the following principles:

12.1.1 The security program addresses the risks identified in an industrial security threat and risk assessment.

12.1.2 Measures are implemented and maintained to prevent the loss of nuclear substances or prevent acts of sabotage at the facility.

12.1.3 Measures are taken to prevent unauthorized access to the mining facility and to areas within the facility where nuclear substances are stored.

12.1.4 The industrial security threat and risk assessment is periodically reviewed and updated.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Security of Nuclear Substances: Sealed Sources	REGDOC-2.12.3

13. SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1

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

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

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Security Program	4037602	Yes

The safeguards and non-proliferation program will be assessed against REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, and the following principles:

13.1.1 Reasonable services and assistance are provided to the IAEA to enable the IAEA to carry out its duties and functions.

13.1.2 Prompt access to all locations at the facility is granted to the IAEA at all reasonable times where such access is required for the purposes of carrying on an activity pursuant to a safeguards agreement. Health and safety services and escorts are provided as required in order to facilitate activities.

13.1.3 Records that must be kept or any reports that are required to be made under a safeguards agreement are disclosed to the CNSC and the IAEA.

13.1.4 Reasonable assistance is provided to the IAEA to enable sampling and removal or shipment of samples.

13.1.5 Reasonable assistance is provided to the IAEA to enable measurements, tests and removal or shipment of equipment.

13.1.6 Measures are implemented to prevent damage to, or the theft, loss or sabotage of samples collected pursuant to a safeguards agreement or the illegal use, possession or removal of such samples.

13.1.7 Reports and information, that is required to facilitate Canada's compliance with any applicable safeguards agreement, is provided to the Commission.

Guidance

There is no guidance provided for this licence condition.

14. PACKAGING AND TRANSPORT

Licence Condition 14.1

The licensee shall implement and maintain a packaging and transport program.

Preamble

The "packaging and transport" safety and control area covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility.

Every person who transports radioactive material, or requires it to be transported, shall act in accordance with the requirements of the *Transportation of Dangerous Goods Regulations* and the *Packaging and the Transport of Nuclear Substances Regulations, 2015*.

The *Packaging and Transport of Nuclear Substances Regulations, 2015* and the *Transportation of Dangerous Goods Regulations* provides specific requirements for the design of transport packages, the packaging, marking and labeling of packages and the handling and transport of nuclear substances.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	4026013	Yes
Cameco	Transportation Program	4036649	Yes

The licensee shall implement and maintain a packaging and transport program that will ensure compliance with the requirements set out in the *Transportation of Dangerous Goods Regulations* and in the *Packaging and Transport of Nuclear Substances Regulations, 2015.*

Guidance

There is no guidance provided for this licence condition.

15. FACILITY SPECIFIC

There are no facility specific requirements.

APPENDIX A CHANGE CONTROL PROCESS

A.1 Change Control Process

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

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

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

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

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

Change Request Form

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

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

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

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

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

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

APPENDIX A

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

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

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

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

c) The assessment of both the short and long term impacts with the mitigation measures in place on:
   - worker's health and safety, including potential radiological and non-radiological exposures
   - the environment
   - security
   - Canada's international obligations

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

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

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

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

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

A.3 Dispute Resolution

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

A.4 Records Management

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

APPENDIX A

A.5 Distribution

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

- Uranium Mines and Mills Division, CNSC
- Cameco Corporation

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH during the previous year in their annual report to the Commission.

APPENDIX B LICENSEE DOCUMENTS THAT REQUIRE NOTIFICATION OF CHANGE

Document Title	e-Doc
Mining Facility Licensing Manual	4026013
Mining Facility Description Manual	4069696
Maintenance Program	4036658
Environmental Management Program	4200759
Waste Management Program	4040582
Radiation Protection Program	4036630
Safety and Health Management Program	4064102
Security Program	4037602
Emergency Preparedness and Response Program	4036659
Quality Management Program	4043422
Training Development Program	4040583
Mining Operations Program	4043427
Process Operations Program	4036654
Public Information Program	4052377
Transportation Program	4036649
Fire Protection Program	4040579
Mine Ventilation Code of Practice	4224647
Preliminary Decommissioning Plan and Cost Estimate	5329312
Cigar Lake Human Health and Environmental Risk Assessment (2017) and Addendum (2019)	5357937 5908811

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

Document	Document Title	Document Number
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A
CNSC	Change Control Process	19-318-07
CNSC	Measuring Airborne Radon Progeny at Uranium Mines and Mills	G-4
CNSC	Ascertaining and Recording Radiation Doses to Individuals	G-91
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	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218
CNSC	Decommissioning Planning for Licensed Activities	G-219
CNSC	Developing and Using Action Levels	G-228
CNSC	Environmental Protection: Environmental Protection Policies, Programs and Procedures	RD-2.9.1
CNSC	Public Information and Disclosure	RD/GD-99.3
CNSC	Licence Application Guide Nuclear Substances and Radiation Devices	REGDOC-1.6.1
CNSC	Safety Culture	REGDOC-2.1.2
CNSC	Design of Uranium Mines and Mills: Ventilation Systems	REGDOC-2.5.4
CNSC	Nuclear Emergency Preparedness and Response, Version 2	REGDOC-2.10.1
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings	REGDOC-2.11.1
CNSC	Security of Nuclear Substances: Sealed Sources	REGDOC-2.12.3
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2

Document	Document Title	Document Number
CNSC	Regulatory Fundamentals	REGDOC-3.5.3
CNSC	Technical and Quality Assurance Requirements for Dosimetry Services	S-106
CNSC	Making Changes to Dose-Related Information Filed with the National Dose Registry	S-260
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010	e-Doc 3678482
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	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	N288.5-11
CSA Group	Environmental risk assessments at Class I nuclear facilities and uranium mines and mills	N288.6-12
CSA Group	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	N288.7-15
CSA Group	Establishing and implementing action levels for releases to the environment from nuclear facilities	N288.8-17
CSA Group	Decommissioning of facilities containing nuclear substances	N294-09
CSA Group	Environmental management systems – requirements with guidance for use	ISO 14001:2015

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

APPENDIX C