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September 29, 2025

VIA EMAIL

Ms. Candace Salmon
Commission Registrar
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, ON KIP 5S9

Dear Ms. Salmon:

Port Hope Conversion Facility renewal of Licence FFOL-3631.00/2027 for a 20-year term

The Port Hope Conversion Facility (PHCF) is located at 1 Eldorado Place, Port Hope, Ontario, L1A 3A1. The PHCF is currently licensed to process natural and depleted uranium compounds. Further to the above-captioned, the current licence for the PHCF, FFOL-3631.00/2027 is set to expire on February 28, 2027.

With the attached application, the PHCF is requesting the CNSC renew the above-referenced Class 1B Nuclear Fuel Facility Operating Licence for the PHCF for a period of 20 years. Cameco is not requesting any changes from the activities authorized under the current operating licence.

Cameco is committed to the safe, clean and reliable operation of all our facilities and strives to continually improve safety performance and processes to ensure the safety of not only our employees but also the public. During the current licence term, the PHCF's operations have maintained radiation exposures well below regulatory dose limits. Further, environmental emissions are being controlled to levels that are a fraction of the release limits, public radiation exposures are well below the established limits, and the facility has a strong occupational health and safety program. The performance of this facility over the current licence period demonstrates that the PHCF is qualified to carry out the activities permitted under the licence.

The attached application will provide the information required to support the renewal of the licence for a period of 20 years. A detailed mapping of the licence application requirements is provided in Appendix 4 of the attached application.

Pursuant to section 15 of the *General Nuclear Safety and Control Regulations* (GNSCR), I have the authority to sign the application on behalf of the PHCF and certify that all statements and representations made in the application and any supplementary documentation are true and correct to the best of my knowledge and are binding on the PHCF.

If you have any questions or if we can provide you with additional information to facilitate your review of the application, then please do not hesitate to contact me or Dave Ingalls, the PHCF General Manager.

Sincerely,

Andy Thorne
Vice-President, Fuel Services Division & Operational Excellence

CAMECO CORPORATION
FUEL SERVICES DIVISION

2025 APPLICATION FOR RENEWAL OF LICENCE FOR PORT HOPE CONVERSION FACILITY FFOL-3631.00/2027

SEPTEMBER 29, 2025

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1.0 INTRODUCTION

1.1 Cameco Corporation and the Fuel Services Division

Cameco Corporation (Cameco) is one of the world's largest uranium producers and is a prominent supplier of uranium processing services required to produce nuclear fuel for the generation of clean electricity. Cameco is committed to the safe, clean and reliable operation of all of its facilities and continually strives to improve safety performance and processes to ensure the safety of both its employees and the people in its neighbouring communities. Cameco's corporate business address is 2121-11th Street West, Saskatoon, Saskatchewan, S7M 1J3.

Cameco's Fuel Services Division (FSD) supplies the world's reactor fleet with nuclear fuel to generate one of the cleanest sources of electricity available today. Cameco operates the Port Hope Conversion Facility (PHCF), which produces uranium hexafluoride (UF_6) and uranium dioxide (UO_2), required in the production of fuel for light water and CANDU-type, heavy water reactors. PHCF's UO_2 and UF_6 conversion services are provided for nuclear operators around the world and satisfy all the UO_2 needs for Canada's domestic CANDU fleet. The business address for the Port Hope Conversion Facility is 1 Eldorado Place, Port Hope, Ontario, L1A 3A1.

The safety of people and protection of the environment are the foundations of Cameco's operations. All workers share the responsibility of continually improving the workplace safety and lessening impacts on the surrounding environment. Cameco values the contribution of every worker and respects individual dignity, creativity and cultural diversity. Through personal and professional integrity, Cameco's workers lead by example, earn trust, honour commitments and conduct our business ethically. Through leadership, collaboration and innovation, Cameco's workers strive to achieve their full potential in the pursuit of excellence in all that they do.

Cameco's four measures of success are:

- a safe, healthy and rewarding workplace,
- a clean environment,
- supportive communities, and
- outstanding financial performance.

Cameco's four measures of success proactively address the financial, social and environmental aspects of its business, and form the foundation of Cameco's sustainable development.

These measures provide the framework on which business decisions are made to ensure that Cameco remains qualified to carry out its licensed activities, in compliance with the applicable regulatory requirements in a manner protective of the environment, health and

safety of people and ensuring that national security and international obligations are maintained.

1.2 Port Hope Conversion Facility

The Port Hope Conversion Facility (PHCF) main operating site is one of the oldest operating nuclear facilities in the world. Radium refinery operations began in late 1932 by Eldorado Gold Mines Limited on the northeastern portion of the site. The company became Eldorado Mining and Refining Limited, a federal Crown corporation in 1944 when Eldorado Gold Mines was purchased by the federal government. In 1988, after its formation, Cameco became the owner and licensed operator of the facility.

The PHCF receives nuclear-grade uranium trioxide (UO_3) from the Blind River Refinery (BRR) for conversion to either UF_6 or UO_2. These compounds are used for the light and heavy water reactor programs, respectively. Uranium processing is federally regulated and licensed by the Canadian Nuclear Safety Commission (CNSC).

As detailed below, the PHCF is integral to the generation of clean electricity domestically and globally:

- Sole commercial supplier of natural UO_2 conversion services for CANDU fuel production
- Uranium processed at the facility is responsible for ~50% of all power generated in Ontario and ~15% of all power generated in Canada
- One of only two facilities in North America producing UF_6 for enrichment and light-water power reactors worldwide

The PHCF is undertaking a major site cleanup and renewal of the facility, known as the Vision in Motion (VIM) Project. The project builds on work now under way through the Port Hope Area Initiative (PHAI) to address historic low-level waste in the Municipality of Port Hope. Significant progress has been made on the project in the current licence period and demonstrates Cameco's commitment to continued operation of the PHCF.

1.3 Application for Licence Renewal

The Vice-President, Fuel Services Division and Operational Excellence is the licence applicant on behalf of Cameco Corporation. Cameco is seeking a licence renewal of the Class 1B Nuclear Fuel Facility Operating Licence FFOL-3631.00/2027 for the Port Hope Conversion facility for a term of 20 years with no changes to the authorized activities or

approved production rates as set out in this application and referenced documents. The current licence for the PHCF is valid until February 28, 2027.

This application for licence renewal is intended to provide the basis for renewal of FFOL-3631.00 and demonstrate adherence of the PHCF's operations to the *Nuclear Safety and Control Act* and associated regulations which are detailed in section 1.4.

Within the requested licence period of 20 years, the PHCF expects to continue with current licensed operations and to complete its VIM project to clean up and renew the facility. This renewal application is written to describe Cameco's licensing basis for the ongoing operations; the licensing basis for the completion of the VIM remediation and decommissioning activities on an active production facility and the current studies supporting these activities.

The current licence authorizes Cameco to possess, transfer, use, process, import, package, transport, manage store and dispose of the nuclear substances that are required for, associated with, or arise from the production of UO_2 and UF_6 and possess and use prescribed equipment and prescribed information that are required for, associated with, or arise from the production of UO_2 and UF_6. The current licence also authorizes Cameco to possess, use, process, store and dispose enriched uranium compounds for experimental and developmental purposes and to store and dispose of enriched uranium compounds in legacy waste.

1.4 Licensing Basis

The basis for licensing consists of applicable laws and regulations, the safety and control measures in the licence and the licence application and documents in support of the application. This includes the *Nuclear Safety and Control Act* (NSCA) and associated regulations, including, but not limited to the following:

- *General Nuclear Safety and Control Regulations*
- *Class I Nuclear Facilities Regulations*
- *Radiation Protection Regulations*
- *Packaging and Transport of Nuclear Substances Regulations, 2015*
- *Nuclear Substances and Radiation Devices Regulations*
- *Nuclear Non-proliferation Import and Export Control Regulations*
- *Nuclear Security Regulations*

Other laws, regulations and international agreements that are applicable to the licensing basis include:

- *Impact Assessment Act* and its regulations*;*
- *Canadian Environment Protection Act, 1999* and its regulations*;*
- *Fisheries Act* and its regulations*;*
- *Nuclear Liability and Compensation Act;*
- *Transportation of Dangerous Goods Act* and its regulations*;*
- *Access to Information Act;*
- *Canada/IAEA Safeguards Agreements;*
- *Canada Labour Code, Part II and Canada Occupational Health and Safety Regulations;*
- *Radiation Emitting Devices Act;*
- *Ontario Environmental Protection Act* and its regulations*;*
- *Ontario Water Resources Act* and its regulations; and
- *Ontario Technical Standards and Safety Act, 2000 and its regulations;*
- *Canada/IAEA Safeguards Agreements*

The safety and control measures are described in the Licence Conditions Handbook (LCH). The CNSC regulatory framework uses CNSC regulatory documents (REGDOCs), Canadian Standards Association (CSA) standards, codes and other regulatory documentation to provide compliance verification criteria as well as additional recommendations and guidance for the PHCF in implementing control measures at the facility. The applicable REGDOCs, standards, codes and other regulatory documentation are provided in Appendix 1, along with current implementation status and implementation dates, as applicable.

PHCF maintains programs and plans to meet the requirements of the Safety and Control Areas (SCA) as required by its licence, which are listed in Appendix 2. These are summarized in the Facility Licensing Manual (PHCF). This application for licence renewal and the referenced supporting documents describes how the PHCF meets licensing requirements and provides the basis for renewal of the operating licence. This application, the FLM and summaries of significant reports supporting the licensing basis as described in the application will be made available to the public through the Fuel Services Division (FSD) community website (www.camecofuel.com). Documents referred to in the application and/or FLM are not all publicly available because they contain confidential and proprietary information, controlled nuclear information or prescribed information as defined by the *General Nuclear Safety and Control Regulations* (GNSCR).

1.5 Application Format

This submission is being made in accordance with the requirements and guidance Regulatory Document REGDOC 1.2.2, *Licence Application Guide: Class 1B Processing Facilities*. This renewal application is written to describe Cameco's licensing basis for the

ongoing operations at the PHCF. The remainder of this application will provide the information required to support renewal of the licence for a period of twenty years.

The information is organized as follows, with a detailed mapping of the licence application requirements set out in the *General Nuclear Safety and Control Regulations*, *Class I Nuclear Facilities Regulations*, *Nuclear Substances and Radiation Devices Regulations* (NSRDR) and the *Nuclear Security Regulations* in Appendix 4.

Section 2 will provide a description of the PHCF operations and other licensed activities.

Section 3 will provide an overview of the site's performance in the current licence period, including achievements and improvement initiatives. A detailed operational performance report for the current licence period is included as Appendix 5.

Section 4 will describe the safety and control areas, programs to meet specific licence conditions, site performance and any improvement initiatives or future activities.

The Appendices provide supporting information for the application and include:

Appendix 1: Standards and Guidance Relevant to Safety and Control Areas
Appendix 2: Documents Supporting the Licence Application
Appendix 3: List of Acronyms used in the application
Appendix 4: Licence Renewal Application Requirements Matrix
Appendix 5: Detailed Operational Performance Report for FFOL-3631.00/2027
Appendix 6: Curve Lake 2024 Annual Report

2.0 DESCRIPTION OF OPERATIONS AND OTHER LICENSED ACTIVITIES

2.1 Organization and Responsibilities

Cameco is a Canadian corporation governed by a board of directors. Operationally, PHCF is part of Cameco's FSD, which is led by a Vice-President. The Vice-President, Fuel Services Division and Operational Excellence reports directly to Cameco's Chief Operating Officer. The organizational structure is further discussed in section 4.1.1.

The Vice-President, Fuel Services Division and Operational Excellence is ultimately responsible to ensure that the facility is operated in accordance with the conditions of the licence, the NSCA and associated regulations. The licensing authority in accordance with subsection 15(a) of the GNSCR for the facility is the Vice President, Fuel Services Division and Operational Excellence. Day-to-day compliance activities are the responsibility of the site General Manager with support and direction from the site regulatory compliance staff. Divisional compliance responsibilities for FSD are handled by the Director, of Regulatory Compliance and Licensing, with support and direction from divisional compliance and licensing staff. Corporately, Cameco has a Safety, Health, Environmental and Quality (SHEQ) department led by the Senior Vice-President and Chief Legal Officer that provides support and oversight for licensed activities. All personnel with the authority to act for PHCF in dealings with the CNSC are identified as described in the FLM.

2.2 Facility Location and Layout

As shown in Figure 1, the facility has two locations in the Municipality of Port Hope. The MPH is situated on the north side of Lake Ontario approximately 100 kilometers east of Metropolitan Toronto.

Site 1 consists of the main site property for operations and storage located at 1 Eldorado Place (designated as "Site 1 – main site operations and storage") as shown in Figures 2 and 3. The main site occupies an area of 9.6 hectares and is bounded on the west by Choate Road and the Municipality of Port Hope Waterworks, on the north by Hayward Street, and on the east by the Port Hope Harbour. Canadian National and Canadian Pacific rail lines separate the facility from the closest residential neighbourhood. The licensed portion of the property is within the fenceline shown in Figure 2.

Site 2 consists of a single property for storage facilities located at 158 Dorset Street East as shown in Figures 4 and 5. The Dorset Street East Warehouse is approximately 2.2 hectares and is located 1.5 km north-east of the PHCF property. The licensed portion of the property is within the fenceline shown in Figure 4.

Figure 1: Location of Port Hope Conversion Facility in the Municipality of Port Hope

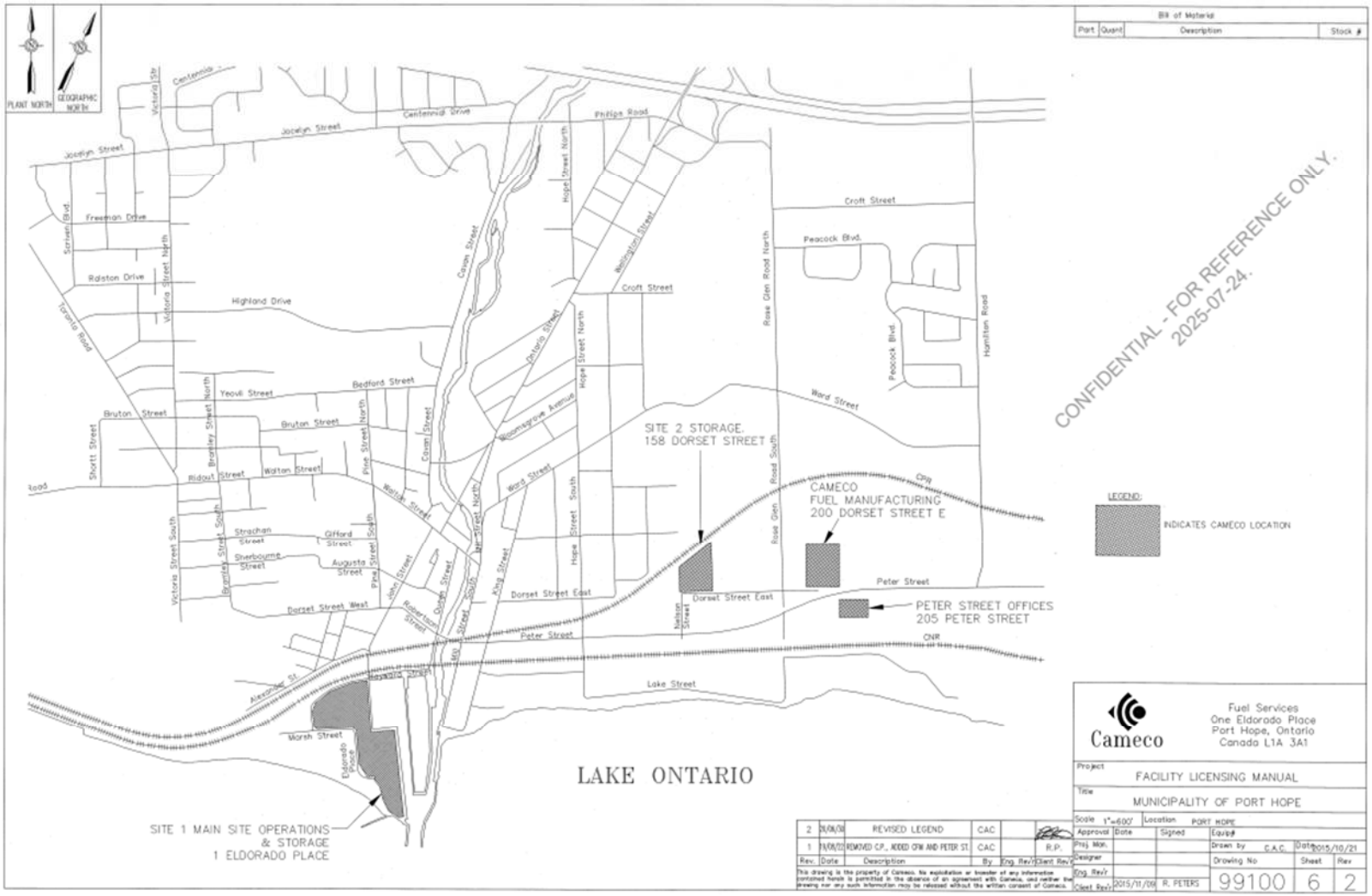


Figure 2: Port Hope Conversion Facility Layout – Site 1: Main Site Operations and Storage

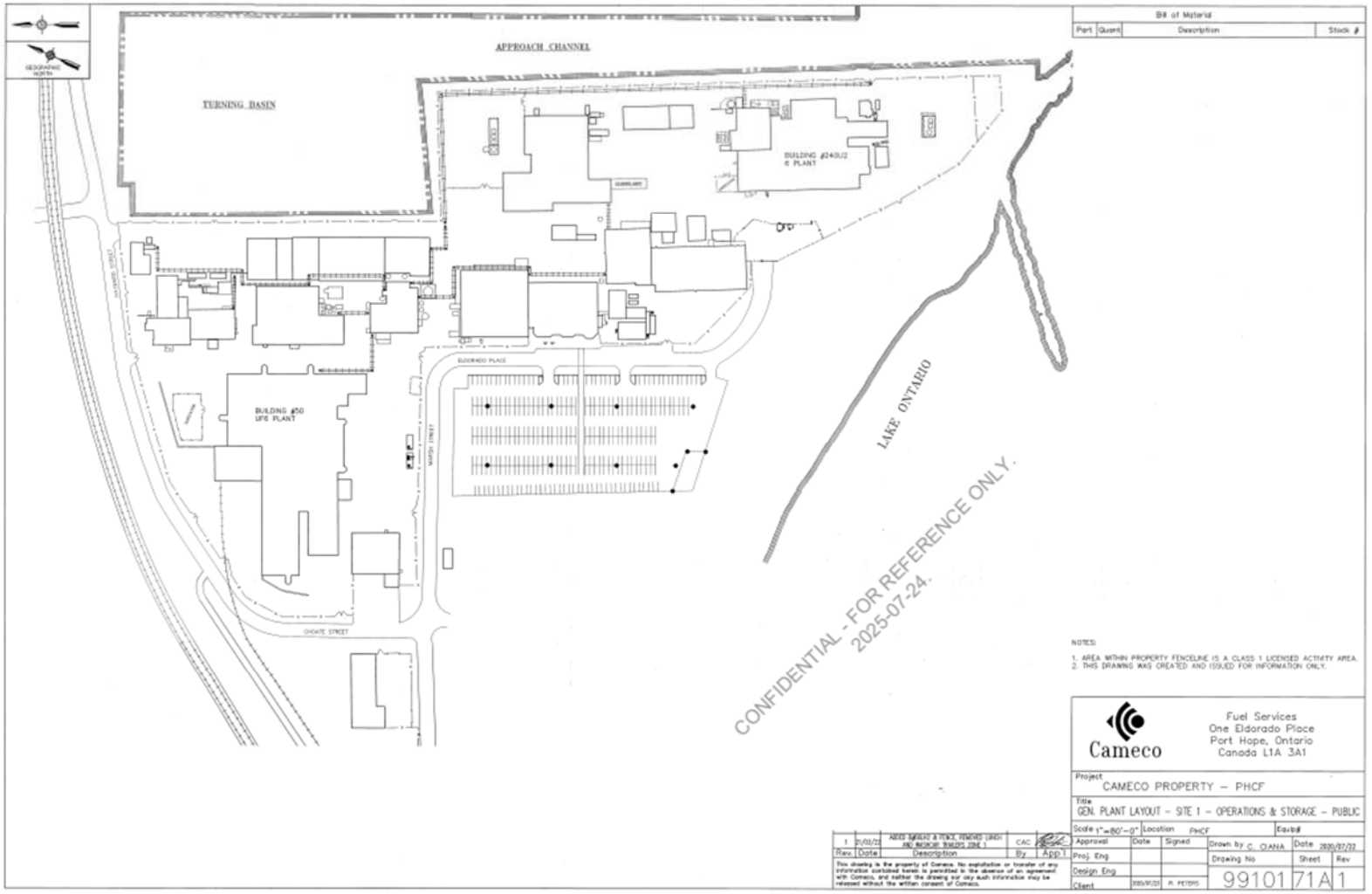


Figure 3: Aerial View of the Port Hope Conversion Facility
Site 1: Main Site Operations and Storage

Figure 4: Port Hope Conversion Facility Layout – Site 2: Dorset Street East Warehouse

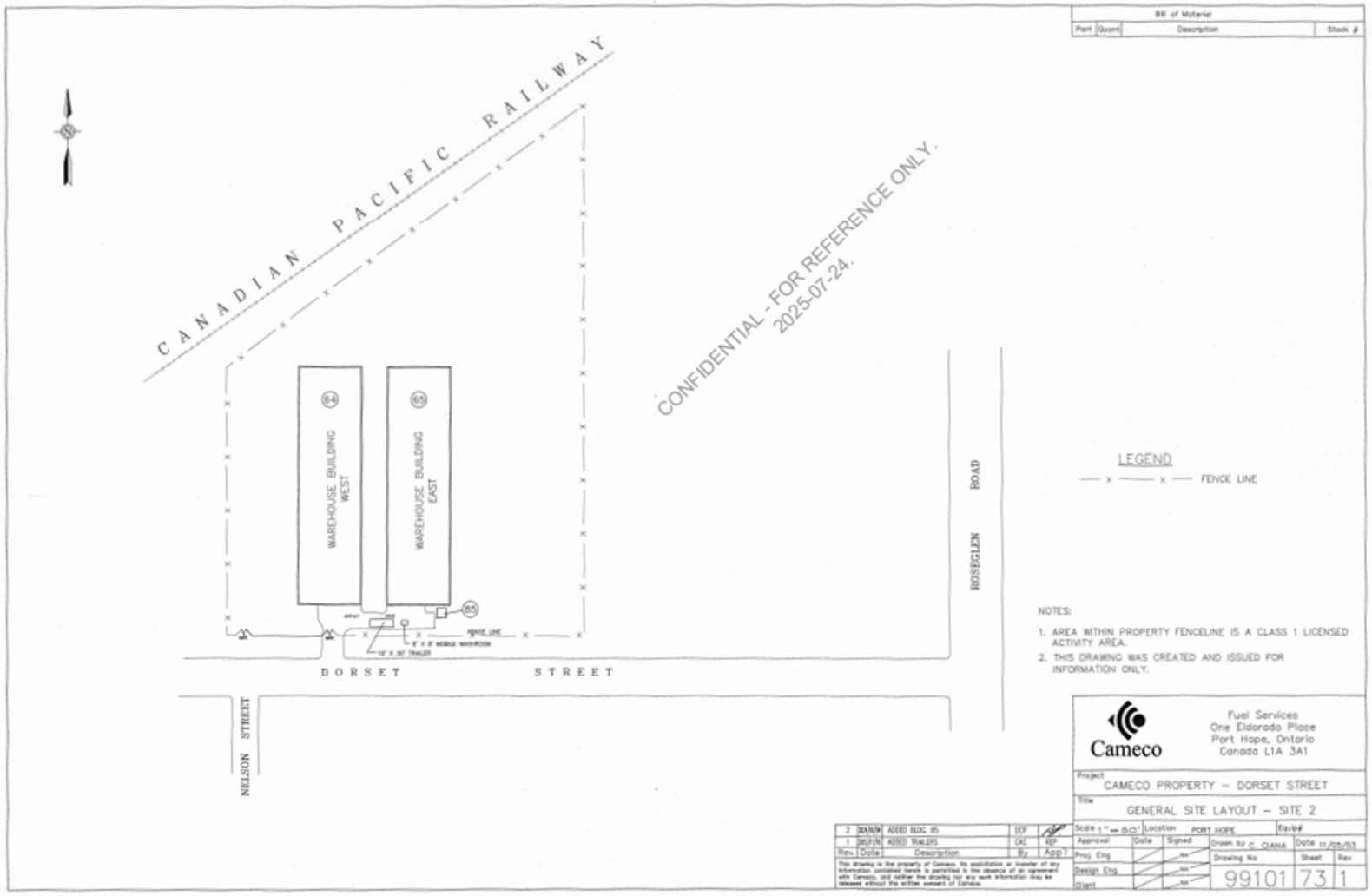


Figure 5: Aerial View of the Port Hope Conversion Facility
Site 2: Dorset Street East Warehouse

2.3 Processes and Materials

2.3.1 Uranium Hexafluoride (UF_6)

As part of the licensing activity of producing UF_6, UO_3 is first pulverized and fed into a fluid bed reactor. Hydrogen gas enters the fluid bed reactors, reducing the UO_3 powder to UO_2. The UO_2 powder is fed into the hydrofluorination reactors where water, hydrogen fluoride (HF) and dilute aqueous hydrofluoric acid convert the UO_2 to uranium tetrafluoride (UF_4). The UF_4 slurry is then dried and calcined, which heats the UF_4 removing the final traces of water.

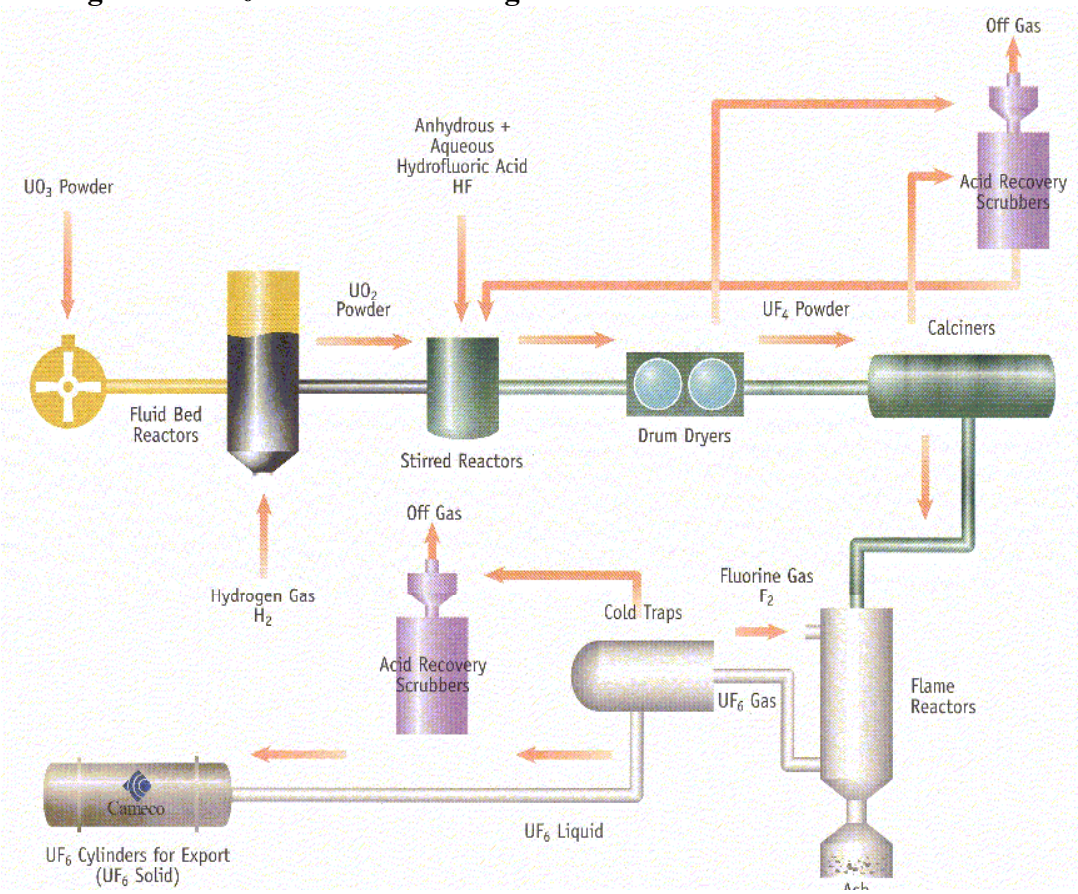
The calcined UF_4 reacts with fluorine gas in a flame reactor to produce UF_6. Cameco produces fluorine using electrolytic cells, which contain molten potassium bifluoride and HF. Electric current is then passed through the cell, which dissociates HF into hydrogen and fluorine. These gases are diverted to separate draw off points and fluorine is used to convert UF_4 to UF_6.

The UF_6 gas produced in both reactors is passed through filters to remove any solid particles before entering the cold traps. The cold traps cool and sublimate the gaseous UF_6 into a white crystalline solid.

When the cold traps are full, they are heated to liquefy the crystallized UF_6. The liquid UF_6 is drained into specially designed, heavy walled 2, 9 or 13 tonne (30B, 48X and 48Y) steel shipping cylinders. The cylinders are allowed to cool to ambient room temperature causing the UF_6 liquid to freeze to a solid. Cylinders containing solid UF_6 are then transported to enrichment plants in other countries.

A simplified block diagram of the UF_6 production process is provided in Figure 6.

Figure 6: UF_6 Process Block Diagram



2.3.2 Uranium Dioxide (UO_2)

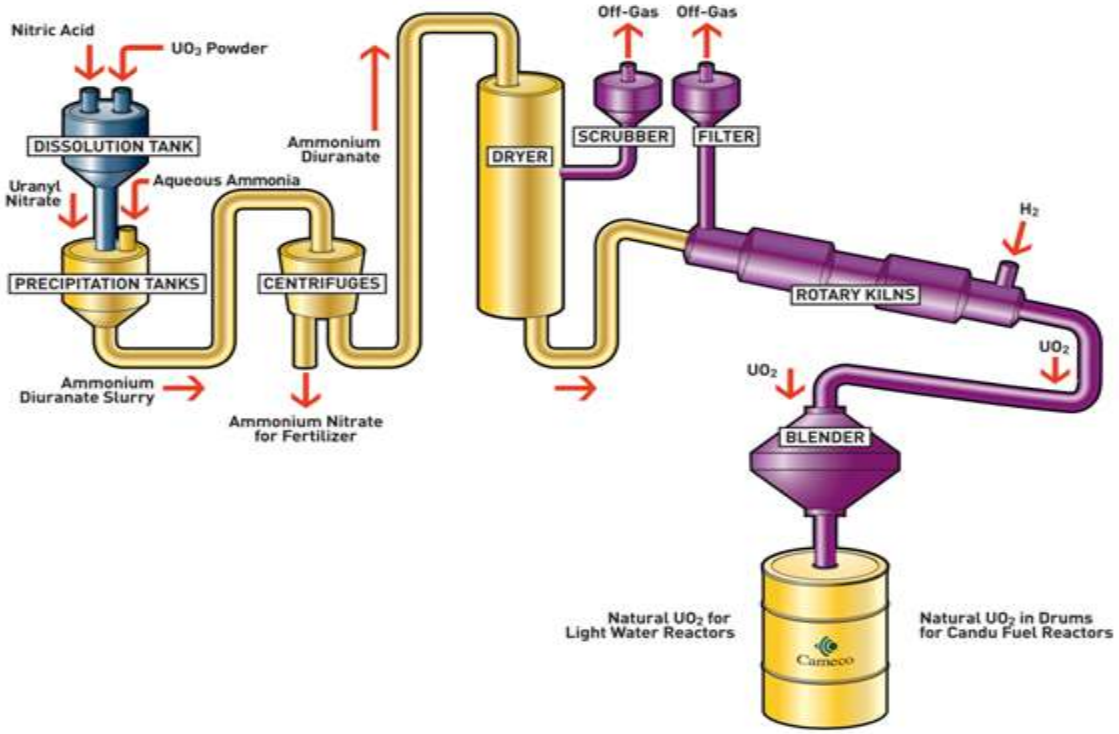
For the UO_2 production process, UO_3 powder is dissolved semi-continuously in nitric acid to produce uranyl nitrate. The uranyl nitrate solution is diluted with water and then reacted with aqua ammonia to precipitate ammonium diurante (ADU).

The ADU slurry undergoes solid liquid separation in centrifuges. The resulting liquid is recovered and sent to the ammonium nitrate circuit for treatment prior to sale as a by-product. The wet ADU solids form a cake in the centrifuge, which is dried continuously by direct contact with hot air in a drier. The dried ADU is then conveyed to the reduction kilns.

The dried ADU solids are reduced with hydrogen to form UO_2 in the heated rotary kilns. The final product of the process is a ceramic grade UO_2 powder. The powder is blended and shipped to domestic and international fuel fabricators.

A simplified block diagram of the UO_2 production process is provided in Figure 7.

Figure 7: UO_2 Process Block Diagram



2.3.3 Depleted Uranium

The UO_2 plant also maintains a depleted uranium circuit. Depleted U_3O_8 is typically received in 205 L drums and gradually added to a dissolution tank containing nitric acid. Depleted U_3O_8 is added to the solution until the appropriate specific gravity and free acid of the solution is obtained. The uranyl nitrate solution is pumped directly to the existing uranyl nitrate storage tank located within the UO_2 processing circuit where it is further processed to ceramic grade depleted UO_2.

2.3.4 Ammonium Nitrate

The UO_2 process generates an ammonium nitrate (NH_4NO_3) solution as a by-product which is released to an agricultural supply company for use as feedstock for production of an agricultural fertilizer. In this process, the solution is separated from the uranium products, filtered and is then concentrated in an evaporator to generate a fertilizer-grade (18 – 21% N) solution. The ammonium nitrate by-product is analyzed to ensure that the uranium and radium contents are less than the exemption quantities in the *Nuclear Substance and Radiation Devices Regulations, 2015* (NSRDR). Solutions that are off-specification are reblended and run through the treatment process a second time. An agricultural supply

company removes certified batches of ammonium nitrate from Cameco property by road tanker to its storage facilities.

2.3.5 Fluoride Product

Within the UF_6 plant effluent treatment circuit, potassium hydroxide (KOH) scrubber discharges, sump materials and cylinder wash solutions are combined and used to neutralize acidic uranium scrap from the flame reactor operations, laboratories and waste recovery. This material is dried to produce a crystalline flake containing potassium hydroxide, potassium fluoride, potassium carbonate and uranium. Occasionally, other inorganic uranium-containing powders are mixed into the solution prior to being dried. The dried flake is known as fluoride product, which is shipped to a licensed uranium mill for uranium recovery.

Cameco ships equipment and materials (i.e. natural uranium scrap, fluoride product and contaminated combustible material) between licensed Cameco sites in order to reduce, re-use, recover and recycle items to the extent practicable. All shipments to and from Cameco's Blind River Refinery and Key Lake Operation are made in accordance with applicable regulations (as detailed in section 1.4) as described in the FSD Packaging and Transportation Program (FSD-PGR-TRN-01).

2.3.6 Nuclear Substances and Radiation Devices

The facility maintains an inventory of sealed sources. PHCF staff track and report their transfer as required by REGDOC 2.12.3: *Security of Nuclear Substances: Sealed Sources and Category 1, II, and III Nuclear Material, Version 2*.

These sources range in type from nuclear gauges and static eliminators to laboratory calibration sources and tracer solutions. The controls associated with sealed sources and radiation devices (including x-ray equipment) are described in the Radiation Protection Program Manual (PHF-MAN-RAD) and Radioisotope Source Control (CAP:RAD:13) and include training, certification where required, leak testing, radiation warning signs and limited access to area where sources are stored.

2.4 Public Information and Community and Indigenous Engagement

The objective of the FSD Public Information and Disclosure Program (PIDP) is to ensure local target audiences with an interest in Cameco's FSD CNSC-licensed facilities are informed on a timely basis about operations, planned activities, health and safety, and potential effects on the environment.

Through a commitment to open communication and an established program for ongoing and timely communication, the program aims to build trust and foster support among primary and secondary audiences as defined in FSD's Public Information and Disclosure Program.

As a publicly traded company, Cameco must comply with strict disclosure requirements under securities laws both in Canada and the United States. These requirements may influence the content and timing of information released to the public.

The PIDP is designed to fulfill the requirements of the CNSC's REGDOC 3.2.1, *Public Information and Disclosure*.

2.4.1 Public Engagement Strategies

PHCF's engagement processes are led by FSD. FSD's overall public engagement process is guided by best practices garnered over decades of experience. These strategies are:

Open Channels for Dialogue

- FSD maintains a variety of communication channels to actively engage with audiences. These open lines of communication help build understanding and allow FSD to listen, respond to, and act on community concerns.
- Examples of these channels include social media, a dedicated email address (cameco_ontario@cameco.com) a phone number (905.885.2020), community barbeque, public opinion polling and participation at community events such as the Port Hope Fall Fair.

Clear and Uncomplicated Communications

- FSD prioritizes fact-based and easy-to-understand communications. By creating clear, concise and accurate content, we help ensure audiences can understand and engage with the information provided.

Adaptive Communications

- Communication is tailored to suit the needs and interests of the various audiences. Whether through public polling, or events such as the Cameco community barbeque or Port Hope Fall Fair, we adapt our communications to reflect the topics that are of interest to the various audiences.

2.4.2 Target Audiences

The PIDP identifies target audiences across two categories: primary and secondary reflecting proximity to the FSD facilities. These categories help tailor communication approaches, but do not necessarily reflect the importance or value placed on any group. In particular, Indigenous rights holders are engaged through a dedicated, respectful approach grounded in relationship-building and transparency.

The identified target audiences are selected due to the potential effects on the environment, health, safety and security related to Cameco's operations being localized to the vicinity surrounding its facilities. Additionally, Cameco has been operating in Port Hope for over 35 years, and these decades of experience have demonstrated that the interest in Cameco's licensed facilities is predominantly localized to the surrounding community.

Primary audiences include those who are directly engaged on a regular basis and who are in close proximity to the FSD facilities. For PHCF, this includes:

- Employees
- Local community residents in Ward 1 and Ward 2 of Port Hope, including those neighbouring CFM and PHCF;
- Local schools;
- Municipal Council and staff;
- Local business organizations, such as the Chambers of Commerce and other relevant industry associations;
- Special interest groups;
- Local non-governmental organizations; charities and community groups;
- Past intervenors in CNSC proceedings;
- Local media; and
- Indigenous Communities:
    - Alderville First Nation
    - Curve Lake First Nation
    - Hiawatha First Nation
    - Mississaugas of Scugog Island First Nation

Port Hope is within the William's Treaty territory area. While there are no First Nations communities located within the MPH, Hiawatha First Nation and Alderville First Nation are located just to the north of Port Hope.

Secondary audiences refer to broader groups that may not be directly engaged, but who may still seek information or wish to participate in engagement activities. For PHCF, this includes:

- Northumberland County residents, businesses and community groups/organizations
- Other interested persons/groups/organizations
- Indigenous Communities
    - Chippewas of Beausoleil First Nation
    - Chippewas of Georgina Island First Nation
    - Chippewas of Rama First Nation
    - Mohawks of the Bay of Quinte
    - Métis Nation of Ontario Region 6

2.4.3 Engagement Mechanisms

FSD uses the following tools to reach its primary and secondary audiences and provide information to the public.

Website

- In addition to its corporate website (www.cameco.com), FSD maintains a dedicated community website (www.camecofuel.com) to broadly communicate information about its Ontario operations and activities.

Social Media

- FSD uses social media to provide news and information about FSD's activities in Ontario, promote community events and engagement activities and drive traffic to Cameco's website. FSD's social media channels are Facebook, X, LinkedIn and Instagram.

Advertising

- FSD uses radio, print and online (including social media campaigns) advertising to support its communication initiatives in Ontario. Advertising is typically used to promote upcoming events and to deliver key messages.

Media Relations

- Requests for information from news media regarding Ontario operations are handled through divisional staff located in Port Hope. FSD monitors news coverage of its operations and the nuclear industry generally on an ongoing basis through subscriptions to media monitoring services as well as search-engine monitoring of news coverage undertaken by FSD staff.

Public Inquiries

- FSD aims to respond to inquiries in a timely manner and to provide access for subject matter experts when needed and has a variety of mechanisms in its PIDP to provide target audiences with opportunities to comment or ask questions about its CNSC-licensed Ontario operations. These include but are not limited to:
    - Social media channels
    - Public inquiry number (905.800.2020)
    - Email inquiry on camecofuel.com (cameco_ontario@cameco.com)
    - FSD leadership and subject matter experts at community or FSD-led events/activities
    - FSD technical liaison contact information provided to CNSC staff for intervenor/public inquiries

In-Person Engagement Opportunities

- FSD actively engages with the local community through both FSD-led and externally hosted events. These in-person opportunities are a key part of the ongoing public engagement strategy, offering valuable moments for one-on-one dialogue with community members.

- Examples include Cameco's annual community barbeque and participation in the Port Hope Fall Fair – both of which allow for meaningful, informal conversations. We also take part in a range of other activities such as local career fairs that help us connect with residents of all ages and interests.

2.4.4 Information Products

FSD makes the following information available to all members of the public through its corporate and/or community websites.

Technical Reports and Licensing Documentation

- Summaries of significant reports supporting the licensing basis of the facilities are available on the dedicated community website, including environmental risk assessment, derived release limit assessment, safety report and preliminary decommissioning plans.
- Documents supporting licensing activities and other select reports are also available to the public on the community website.

Quarterly and Annual Compliance Reports

- Quarterly Monitoring and Operational Performance Reports and Annual Compliance Reports are posted on camecofuel.com.

Videos

- FSD may choose to develop and deploy videos to help highlight various aspects of its operations and/or community activities. These videos may be utilized on its website and/or social media or used at off-site events.

Printed Material

- Print material includes items such as the Energize newsletter, fact sheets and/other printed items. The Energize newsletter is mailed out a minimum of three times per year to every address in Port Hope. Fact sheets are available at community and FSD-led events.

Information Boards

- FSD may choose to use information boards to help highlight various aspects of its operations and community investment activities. These boards may be deployed at community or FSD-led events.

Additional information may be requested at any time through the public inquiry options described above.

2.4.5 Indigenous Engagement

Cameco is committed to building meaningful and long-term relationships with Indigenous communities based on trust, transparency, and respect, through open and honest communication, understanding the unique needs of each community, and creating opportunities for shared value. In this regard, we provide opportunities to engage with First Nation and Métis communities regarding its operations in Ontario and our engagement efforts are in compliance with CNSC's REGDOC-3.2.2. In support of this application, PHCF will submit an Indigenous Engagement Report which fulfills the requirements set out in REGDOC-3.2.2.

Cameco has formalized its relationships with CLFN and MSIFN. These agreements foster reciprocal learning and allow all parties to explore areas of interest and to build meaningful relationships. Cameco's relationship agreements focus on long-term success through five key pillars: education and workforce development, business development, community investment, community engagement and environmental stewardship. More details about the relationship and joint activities with Curve Lake are highlighted in the Curve Lake 2024 Annual Report in Appendix 6.

During the current licence period, Cameco engaged with Williams Treaty First Nations and the Métis Nation of Ontario (MNO) Region 6, offering and providing an overview of local operations to interested First Nations and the MNO.

Public disclosures are sent via email directly to CLFN, MSIFN and Hiawatha First Nation as jointly agreed upon to create greater trust and ensure transparency.

Quarterly Compliance Monitoring and Operational Performance Reports and Annual Compliance Reports are sent via email to Alderville, Curve Lake, Hiawatha, Mississaugas of Scugog Island, Chippewas of Rama First Nations, and the Mohawks of the Bay of Quinte as requested by the respective Nations.

This licence application does not request any changes to the current licensed activities, including production limits. Therefore, Cameco has determined there is no impact to the conclusions of the Environmental Risk Assessment and the licensed activities will not result in either new impacts to the environment or the potential for new adverse impacts on the asserted or established Indigenous and/or treaty rights of Indigenous communities.

Cameco is sending correspondence to the Indigenous communities identified in section 2.4.2 to advise of the submission of this licence application. We are committed to being proactive in our efforts to engage throughout the licensing period. Our engagement will include the ongoing sharing of information, as well as creating opportunities for dialogue, and addressing interests and concerns in a transparent manner.

2.5 Preliminary Decommissioning Plan Financial Guarantee

The PHCF has a Preliminary Decommissioning Plan (PDP), which was prepared based on guidance provided in CSA N294.0-19 *Decommissioning of facilities containing nuclear substances* and REGDOC 2.11.2, *Decommissioning.* The PDP outlines the general requirements for returning the site to the status of unrestricted use and outlines the controls required for the protection of the environment during the decommissioning process. The PDP forms the basis for the financial guarantee in accordance with CNSC REGDOC 3.3.1 *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*. The financial guarantee for $138.2 million was approved by the Commission in May 2024 and is maintained in the form of an irrevocable letter of credit.

Cameco's PHCF PDP documents the following:

- the selected decommissioning strategy
- main decontamination, dismantling and or clean up strategies
- end-state objectives
- an overview of the principal hazards and protection strategies
- a waste management strategy
- a cost estimate
- financial guarantee arrangements

3.0 SITE PERFORMANCE OVERVIEW

This section describes operational highlights and improvement initiatives during the current licence period (Q1 2017 – Q4 2024). A detailed review of performance broken down by Safety and Control Area (SCA) is provided in Appendix 5.

3.1 Performance in the Current Licence Period

Cameco is committed to the safe, clean and reliable operation of all of its facilities and continually strives to improve safety performance and processes to ensure the safety of both its employees and local residents. PHCF maintains the required programs, plans and procedures in the areas of health and safety, radiation protection, environment, emergency response, fire protection, waste management, and training. PHCF's operations have maintained employee radiation exposures well below the regulatory dose limits. Environmental emissions and public radiation exposures are controlled to levels that are a fraction of the regulatory limits.

In its annual performance reports to the Commission, CNSC staff has rated PHCF's performance as Satisfactory in all SCAs each year of the current licence period. CNSC staff continue to confirm that PHCF is in overall compliance with the CNSC regulatory and licensing requirements. Action notices and recommendations made by CNSC inspectors and specialists are reviewed and used to strengthen existing programs and controls to ensure that safety, security and the environment are not compromised.

Cameco is committed to continuous improvement at all of its operations. In the current licence period, PHCF has enhanced its effective site programs to align with new and/or updated CSA standards and new REGDOCs.

3.2 Facility Operation and Physical Design

Throughout the licence period, PHCF operated routinely with no major operating problems. The UO_2 plant shuts down annually in the summer for scheduled maintenance work, employee vacation time and to align production requirements with PHCF. Due to production requirements, in 2024, UF_6 plant transitioned from a summer shutdown. to mini outages (1-2 weeks) to accommodate plant repairs and the CNSC/IAEA PIT/PIV. There are additional shutdown periods throughout the year, ranging from a few hours to a few days for maintenance related activities or extended power outages due to storm events. As well, there was a five-week shut-down in 2020 in response to the COVID-19 pandemic.

The VIM project, which is being executed through a site-specific licence condition has resulted in changes to the physical design of the site throughout the licence period. VIM has removed contaminated soil in serval areas of the site, deconstructed Buildings 14, 15, 27, 40, 41, 43 and removed the liquid hydrogen system north of Building 27 and constructed a new liquid hydrogen system to the south of Building 24. Civil infrastructure was replaced in several locations on the site, redundant pipe rack removal was initiated,

and redundant equipment was removed from Buildings 2 and 5. Cameco safely shipped waste generated through these activities to the Long-Term Waste Management Facility (LTWMF) located in Port Hope and operated by Canadian Nuclear Laboratories (CNL).

One significant operational change was that Cameco replaced the once through cooling water system with a closed loop system in 2023. The closed loop system was installed at Buildings 24 and 50 and the previous system was decommissioned.

3.3 Radiation Protection

The well-established radiation protection program at PHCF has been demonstrated to be effective in the prevention of unreasonable risk to the health and safety of workers. The total effective dose (TED) for all new energy workers (NEW) is shown in Table 1, which are well below the annual regulatory limit set out in the *Radiation Protection Regulations* of 50 mSv/yr.

Table 1: Total Effective Dose in Current Licence Period

2017 - 2024 Total Effective Dose				
Year	**Number of Individuals**	**Minimum Dose (mSv)**	**Average Dose (mSv)**	**Maximum Dose (mSv)**
2017	808	0	0.4	3.9
2018	1025	0	0.6	6.3
2019	1177	0	0.4	4.9
2020	994	0	0.5	5.5
2021	908	0	0.7	6.6
2022	1150	0	0.5	5.9
2023	1173	0	0.6	9.0
2024	1140	0	0.5	5.2

The five-year regulatory limit of 100 mSv established in the *Radiation Protection Regulations* applies to unique five-year periods of time. The periods relevant to the current licence period extend from January 1, 2016 to December 31, 2020 and January 1, 2021 to December 31, 2025. For the first five-year period under this licence (January 2016 to December 2020), the maximum TED for a single individual for all five years was 20.6 mSv. For the current period (January 2021 to December 2025) the highest individual result to date is 19.9 mSv (up to December 2024). This dose data is well below the regulatory limits of 50 mSv/y and 100 mSv/y.

3.4 Conventional Health and Safety

PHCF has a mature Occupational Health and Safety program with a strong commitment to safety. A strong safety culture built from hard work, continuous training, a culture of looking out for all employees.

During the current licence period (2017 – 2024) there were 6 Lost Time Injuries (LTI) with one in 2017, two in 2018 and three in 2024. There were no LTI from 2019 – 2023.

3.5 Environmental Protection

PHCF controls and monitors all releases of nuclear and hazardous materials from the facility. Environmental monitoring is described in the Environmental Protection Program (EPP). A new EPP was developed in the current licensing period to implement the full requirements of Canadian Standards Association (CSA) *N288.4 Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills* and *N288.5 Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*. The EPP and supporting documents were further updated to incorporate updated? requirements from other standards from the CSA N288 suite of environmental standards throughout the licensing period.

During the current licence period, PHCF exceeded four environmental action levels at the UF_6 main stack. These events were managed appropriately and demonstrate that the action levels are appropriate for identifying potential losses of control of the EPP.

During the current licence period, PHCF exceeded the sanitary sewer action level a total of 38 times. Cameco's investigation into these events identified that aging subsurface infrastructure in areas of the site with known groundwater contamination resulted in groundwater infiltration into the sanitary sewer discharge, exacerbated by precipitation events and environmental conditions.

Cameco targeted sanitary sewer infrastructure rehabilitation, replacement and/or abandonment tasks throughout the licence period to improve the subsurface infrastructure in these areas. This work has been successful in reducing the uranium loadings to the sanitary sewer.

Discharges to the sanitary sewer are from grey and dark water sources and the powerhouse. There are no process systems connected to the sanitary system. Given that this was a new action level introduced for the current licence period, Cameco worked with the CNSC to revise the daily action level to a monthly action level to reflect operational risk. Since this was incorporated in 2023, there has been no further exceedances of the action level.

3.6 Waste Management

In the current licence period, Cameco reduced the inventory of accumulated waste stored in drums at the PHCF by approximately 75%. Most of this material was eligible for disposal at the Long-Term Waste Management Facility (LTWMF) located in Port Hope and operated by Canadian Nuclear Laboratories (CNL). The remainder of the material was disposed of at a permitted hazardous waste landfill in the United States.

In 2018 and 2019, Cameco shipped accumulated waste on the Centre Pier to the LTWMF, allowing Cameco to deconstruct the buildings on the Centre Pier. Once licensed activities at this property were terminated in 2019, the Centre Pier property was removed from Cameco's licensed site and CNL assumed control of the property.

Cameco continues efforts to characterize and prepare legacy waste at Site 2 (Dorset Street Warehouse). The accumulated waste inventory will be further reduced in the next three years.

4.0 SAFETY AND CONTROL AREAS

4.1 Management System

The management system program at PHCF is the framework that currently guides the processes and programs required to ensure safety objectives are achieved, performance is monitored and a healthy safety culture is maintained. The Management System Program Manual (MSPM) meets the requirements of CSA N286-12 (R2017): *Management System Requirements for Nuclear Facilities* and REGDOC 2.1.1: *Management System*.

PHCF's management system is based on the following principles, which are described in more detail in the MSPM, and applied in a graded manner commensurate with risk:

- Safety is the paramount consideration guiding decisions and actions;
- The business is defined, planned and controlled;
- The organization is defined and understood;
- Risks are identified and managed;
- Resources, generally captured as financial, human and infrastructure, are identified and managed;
- Communication is necessary and must be effective to achieve our business objectives;
- Information is identified and managed;
- Work is identified and managed;
- Problems are identified, assessed for significance and resolved as appropriate to the significance;
- Changes are identified and controlled;
- Assessments are performed;
- Experience is sought;
- The management system is continually improved; and
- Corporate oversight is defined and performed to ensure the management system meets the business needs of the organization.

The MSPM also applies to supplier(s) contracted to perform the life-cycle activities of design, supply chain, construction, commissioning, operation, and decommissioning, as appropriate, as they relate to the PHCF. However, PHCF's top management remains accountable to ensure the requirements of this program are met.

An annual site management review is held with site, divisional and corporate leadership to review the suitability, adequacy, and effectiveness of the corporate Safety, Health, Environment and Quality (SHEQ) policy and the site programs and procedures to ensure conformance to both Cameco and CNSC requirements. These reviews include assessing opportunities for improvement and the need for changes to site programs, including objectives and targets. Actions are assigned and tracked in the Cameco Incident Reporting System (CIRS).

4.1.1 Organizational Structure

The organizational structures of FSD and PHCF are shown in Figures 8 and 9. The Vice-President, Fuel Services Division and Operational Excellence, directs the operation of and maintains corporate responsibility for the PHCF. The general manager, PHCF operations, has the responsibility of operating the facility in accordance with the corporate policies, principles and operating budgets approved by the company's board of directors. To facilitate administrative control within the facility, employees have been organized into a number of departments. Production and service-oriented departments have been segregated, but all departments report to the general manager.

Designated personnel are responsible for all operations within their departments, which must be carried out in a manner consistent with company policies, programs, plans and procedures. In accordance with Section 15 of the *GNSCR*, the persons who have authority to act for PHCF in dealings with the Commission, and the name and position titles of the persons who are responsible for the management and control of the licensed activities are documented in writing and provided to CNSC staff.

Figure 8: Organizational Structure – Fuel Services Division and Corporate that Support PHCF

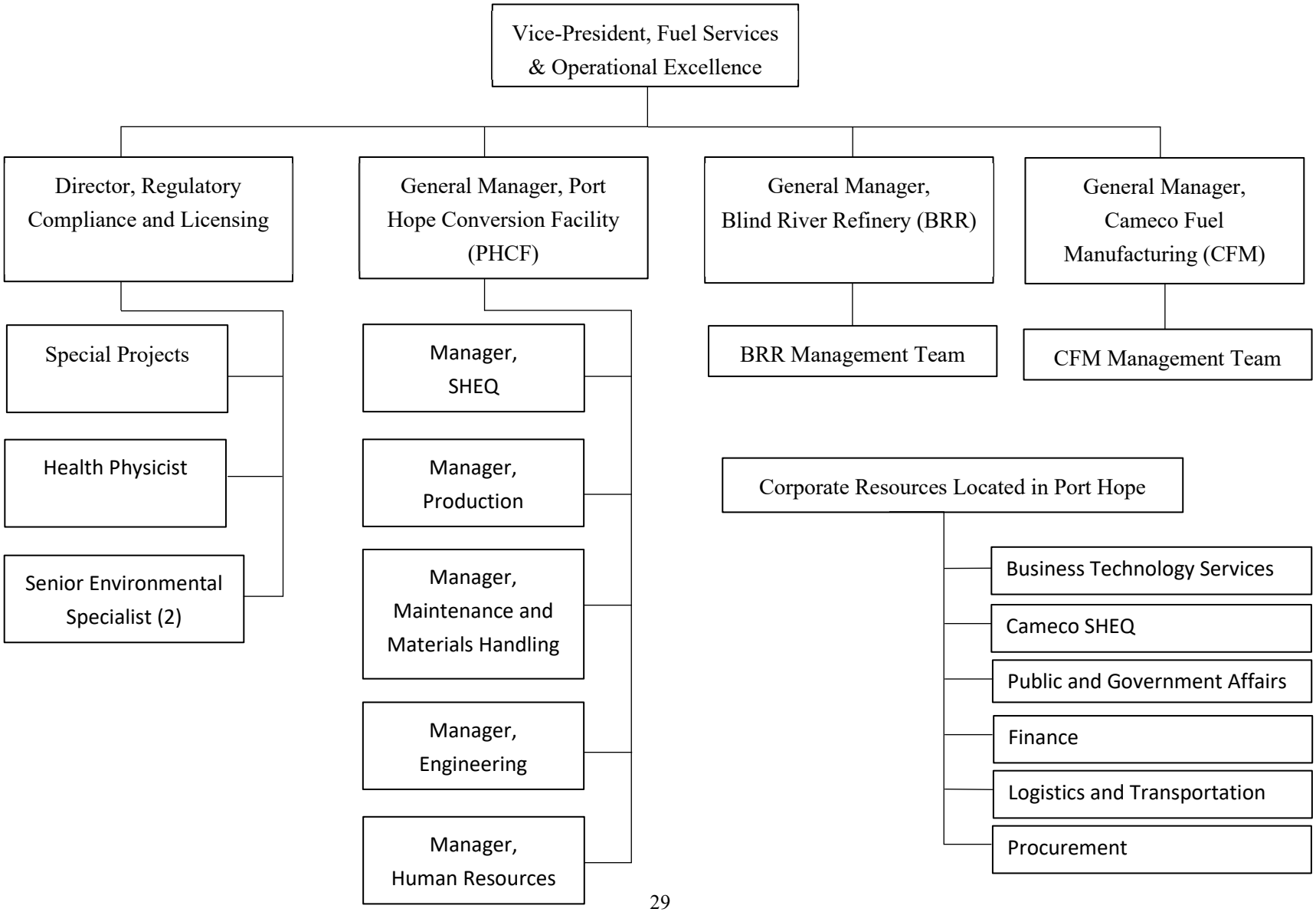
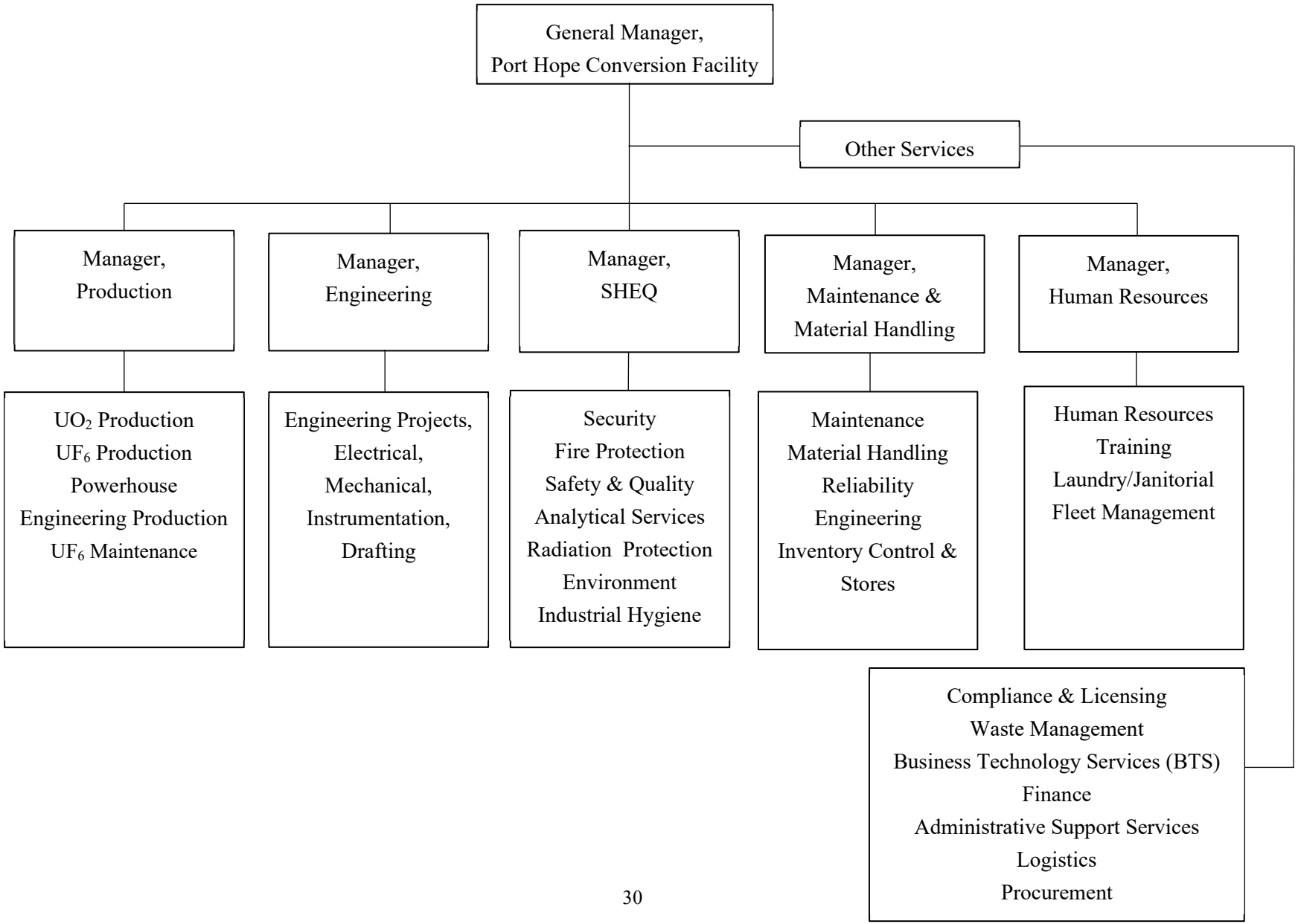


Figure 9: PHCF Organizational Structure



4.1.2 Safety, Health, Environment and Quality (SHEQ) Policy

Consistent with its vision, values and measures of success, Cameco emphasizes that the health and safety of workers and the public, protection of the environment, and quality of its processes are the highest corporate priorities during all stages of its activities, which include exploration, development, operations, restoration, decommissioning and reclamation. As such, Cameco is striving to be a world class performer in all aspects of our business through a strong safety culture, environmental leadership, operational excellence and our commitment to the following:

- Preventing injury, ill health, and pollution;
- Fulfilling compliance obligations;
- Keeping risks at levels as low as reasonably achievable, taking into account economic and societal factors;
- Ensuring quality of processes, products and services; and
- Continually improving our overall performance.

These commitments are reflected in the SHEQ policy, which is publicly available on the Cameco website (www.cameco.com). These commitments are approved and supported by Cameco's board of directors. The officers, senior management and all employees are accountable for the performance of their jobs in compliance with this policy and all relevant legislation.

4.1.3 Safety Culture

Cameco's corporate focus on its management system through governance, quality and safety culture drives accountability and oversight at all operations. Divisional oversight and collaboration are enhancing the FSD safety culture through consistency, management system enhancements and/or divisional program development, to improve safety and environmental performance.

Cameco conducts safety culture surveys (also called safety culture assessments) approximately every five years at all sites within the FSD. These safety culture assessments are conducted in accordance with REGDOC-2.1.2, *Safety Culture*. These surveys gauge the perception of employees in relation to safety culture in a scientifically meaningful way. From these surveys/assessments, Cameco leadership (i.e., the PHCF GM) develop action plans in areas where opportunities for improvement are identified. Further, these actions are entered into CIRS for tracking and follow-up. The safety culture assessments conducted for the PHCF during this license term were completed in 2015 and 2021(delayed due to COVID) and are discussed in Appendix 5.

The PHCF and FSD leadership teams are committed to enhancing a sustainable safety culture and will continue to work diligently to ensure that all employees remain engaged to the extent possible.

4.2 Human Performance Management

PHCF maintains processes to support human performance in its operations. Aspects of human factors have been considered in the development and continual improvement of site management system programs, work instructions, engineering and operations activities, change control and the corrective action process.

Work instructions and operating documents are developed in consideration of the physical interaction of people and the production plant equipment or systems. Various risk assessment tools are used as part of continual improvement, project design and implementation and change control to identify and control error-likely situations.

Corporate requirements for self-check, personal accountability, fitness for duty, and safety and radiation protection apply to all Cameco facilities to support human performance. These are embedded into the site's operating philosophy through multiple tools and practices intended at engaging employees, promoting awareness of operational status, correcting issues and improving communication within and between crews.

PHCF maintain the minimum complement of sufficient personnel to safely operate the facility and respond to emergency situations. Further detail regarding the minimum complement scenarios for production and security personnel is security-sensitive and considered commercially confidential.

PHCF provides training to meet legislative and internal company requirements to ensure that employees have adequate knowledge and skills to fulfil their roles and responsibilities. Employee training plans identify initial and continual qualification requirements of positions. Training plans include position specific, site specific, corporate, progression, and role specific requirements where applicable.

The Cameco training plan:

- Ensures employees are competent on the basis of appropriate education, skills, experience and behaviour(s);
- Provides a means of measuring, monitoring and improving the capability of employees to meet organizational objectives;
- Ensures all training is as efficient and effective as possible;
- Provides a continuous improvement mechanism for the training program.

Department-specific training plans exist for UF_6 (CQP-942 and CQP-943) operations.

Employees are required to meet specified qualification requirements prior to performing assigned task(s) in an unsupervised environment. A qualification consists of related knowledge, skills and attributes (or behaviours) required to perform a task or set of related tasks.

The Cameco procurement and project management processes ensure that contractors are qualified to carry out the work they are contracted to do and would typically not require contractors to complete a SAT-compliant qualification process. However, all contractors and some other non-site personnel who will be performing work in designated areas of the facility are required to complete contractor orientation.

This safety orientation is delivered by the training department and is a structured review of the site hazards, risks and safety procedures that must be followed while on site. Additional work-area specific awareness may be provided through the job hazard analysis and pre-work briefings facilitated by the contractor sponsor. Contractor safety orientation and Nuclear Energy Worker (NEW) qualifications are valid for a period of one year.

In addition to the CNSC's regulatory requirements, the requirements of the *Canada Labour Code* apply to the PHCF. Under Part II of the Canada Labour Code, management and supervisors must take every reasonable precaution for the protection of workers, including ensuring workers use prescribed protective equipment and are advised of potential and actual hazards. It is a requirement that supervisors and management are trained to fully execute these responsibilities, and this training is part of the required health and safety related training for supervisors.

4.2.1 Training Program

The PHCF training program describes the processes in place for a Systematic Approach to Training (SAT). The Port Hope Training Plan, TP01, meets the requirements of REGDOC-2.2.2, *Personnel Training, Version 2*. Operation of the conversion facility requires both professional and non-professional workers for which on-the-job training is required. The conversion facility also has training programs for specific areas, such as emergency response, radiation safety, environment and health and safety. The goal of training is to develop and maintain a competent workforce.

Training and development strategies at PHCF strive to:

- Promote a culture of safety, health and environment
- Apply the corporate systematic approach to training
- Comply with and move beyond legal and regulatory requirements
- Incorporate adult learning principles
- Create a respectful and supportive learning environment by recognizing differences in styles and learner demographics
- Develop employees at every level
- Develop the full potential of all employees in a positive learning environment
- Contribute to business results and competitiveness

PHCF provides training to meet legislative and internal company requirements to ensure that employees have adequate knowledge and skills to fulfill their roles and responsibilities.

Employee training plans identify initial and continual qualification requirements of positions. Training plans include position specific, site specific, corporate, progression, and role specific requirements where applicable. This includes specific training plans for contractors, supervisors and designated work areas. Department-specific training plans exist for UF_6 (CQP-942 and CQP-943) operations.

PHCF maintains the minimum complement of sufficient personnel to safely operate the facility and respond to emergency situations. Further detail regarding the minimum complement scenarios for production and security personnel are security-sensitive and considered commercially confidential.

4.3 Operating Performance

An operating program includes an up-to-date set of operating limits for the facility and activities authorized under the licence, including production limits and limits for the possession, use, management, transfer, storage of nuclear substances, and an inventory of nuclear substances possessed under the licensees' operating licence.

The FLM provides an overview of all the programs in place at the conversion facility to ensure that it operates in a safe manner. The performance of these programs is regularly assessed to assure the site management that these programs are implemented, adequate and effective. Corporate personnel also perform audits of the site management programs on a regular basis to verify that site performance meets both corporate requirements and complies with all applicable regulatory requirements.

4.3.1 Operating Limits

Operating limits are defined in the licensing basis upon which the Commission rendered its decision to renew the conversion facility operating licence in 2017. This licensing basis has been in place for many years with minor changes. They are set out in the licence, Licence Conditions Handbook (LCH) and the FLM.

The current annual and daily production limits for the conversion facility are:

- 2800 tonnes of uranium as uranium dioxide
- 12,500 tonnes of uranium as uranium hexafluoride
- 45 tonnes of uranium hexafluoride daily

Environmental release limits and radiation protection limits are established to ensure the protection of workers, the public and the environment. Radiation protection limits are set out in REGDOC 2.7.1, *Radiation Protection* and documented in the Radiation Protection Program Manual, PHF-MAN-RAD. Environmental protection limits are documented in the Environmental Protection Program, EPP and further discussed in Section 4.9 of this application.

Radioisotope sources are used at the PHCF. The Radioisotope Source Control, CAP:RAD:13 describes the inventory of sealed sources and tracking and reporting requirements in accordance with REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1*.

4.3.2 Operating Plan

Cameco develops three-year plans for strategic planning for the immediate future, with 10-year plans for business development purposes. In the three-year strategic plan, the annual production targets are based on PHCF UO_2 and UF_6 contracts. From a developmental planning perspective, the uranium market has fully recovered and demand for UF_6 is very high.

4.3.3 Reporting Requirements

PHCF reports information to the Commission as required under the NSCA, its regulations, and REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*.

Cameco submits quarterly compliance reports as well as an annual compliance and performance report to the CNSC in accordance with the LCH. These reports are available to the public on the FSD community website (www.camecofuel.com).

Non-routine reporting includes incidents related to plant operations, action level exceedances and environmental releases and other events as defined in sections 29-32 of the *General Nuclear Safety and Control Regulations*, section 27 of the *NSCA*, REGDOC-2.12.3 and the LCH. All non-routine reporting is included in the quarterly and annual reports. In accordance with Cameco's Public Disclosure Protocol for Ontario Operations, the following events are also posted to the FSD community website:

- unusual operational events at our facilities that may have off-site consequences or that would be of interest to our target audience.
- environmental event that triggers a notification to the CNSC under Section 29 of the GNSCR.
- summaries of non-routine environmental incidents that are required to be reported to the Ontario Spills Action Centre.

4.3.4 Regulated Activities

The PHCF is federally regulated by the CNSC as a Class 1B nuclear facility. However, PHCF is also regulated by other government agencies through statute, regulation, permit, approval and/or licence. Table 2 provides a list of key regulatory authorities along with an overview of the key activities they regulate as they pertain to the facility.

Table 2: Agencies with Jurisdiction over PHCF Operations

Agency	Activities Under Jurisdiction
Environment and Climate Change Canada (ECCC)	National Pollutant Release Inventory, halocarbons, spills reporting, deleterious substances enforcement under the *Fisheries Act*
Department of Fisheries and Oceans	*Fisheries Act* and regulations related to protection of fish and fish habitat
Ontario Ministry of the Environment, Conservation and Parks (MECP)	Discharges to air and surface water and associated approvals, monitoring wells and spills reporting
Municipality of Port Hope	By-laws related to noise and sanitary sewer
Department of Employment and Social Development Canada (ESDC)	Conventional health and safety issues through the Canada Labour Code
Ontario Ministry of Labour (MOL)	Contractors at the facility may fall under provincial health and safety regulation
Ontario Technical Standards and Safety Authority (TSSA)	Regulate boiler and pressure vessels and associated piping
Transport Canada	Transportation of dangerous goods and navigable waters regulation
International Atomic Energy Agency	Accounting for nuclear material

4.4 Safety Analysis

The design, construction and operation of the PHCF is intended to eliminate or minimize to the extent possible the potential of radiological, chemical or other physical hazard to facility personnel, the environment and the general public. This is accomplished not by a single approach but rather by a defense-in-depth approach. The hazards, preventative measures and mitigating controls associated with the licensed activities at the PHCF have been systematically reviewed and documented from several perspectives, including but not limited to the following assessments:

- PHCF Safety Analysis Report (SAR)
- Fire Hazard Analysis (FHA)
- Environmental Risk Assessment (ERA)
- Derived Release Limit Report (DRL)
- Spill Prevention and Contingency Plan (SPCP)
- Environmental Aspects Registry

4.4.1 Safety Analysis Report

Hazard risk assessments and safety analyses are now the cornerstone of process safety management throughout the world. This is a widely accepted method and practice used by industry and regulators to assess the risk and potential impact from plant operations.

PHCF utilized a Process Hazards Analysis (PHA) methodology to systematically identify and analyze hazards associated with the licensed activities. A PHA is a set of organized and systematic assessments of the potential hazards associated with an industrial process; provides information intended to assist managers and employees in making decisions for enhancing safety and reducing the consequences of unwanted or unplanned releases of hazardous chemicals; and, is directed toward analyzing potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals, focusing on equipment, instrumentation, utilities, human actions, and external factors that might impact the process.

The SAR takes the detailed analyses found in the PHAs and summarizes by area the hazards, potential accident scenarios and controls in place to prevent and/or mitigate the consequences of these scenarios. The SAR is reviewed periodically to assess the following and revise scenarios, safety measures and conclusions as appropriate:

- incidents that have occurred at the facility against the report to confirm the response of safety systems
- design changes, including those initiated as a result of an incident or accident
- results of supporting studies and reports
- credible accident scenarios and predictive modelling

The SAR was updated in 2022 to incorporate information from other supporting studies, such as flood assessment and external event analysis, and to incorporate guidance from the International Atomic Energy Agency (IAEA) standard SSR-4, *Safety of Nuclear Fuel Cycle Facilities* and to meet the requirements of REGDOC-2.4.4, *Safety Analysis for Class 1B Nuclear Facilities*. Further, Cameco expects to submit a revision of the SAR in Q4 2025.

The SAR demonstrates that the current site safety systems, procedural controls and abatement equipment in place at PHCF mitigate risk to the public and the environment arising from accidents associated with the uranium and hazardous materials stored, processed and transported to and from the PHCF.

The SAR contains technical detailed information that is considered confidential and proprietary and includes controlled nuclear technology and is not publicly available. Cameco has prepared a technical summary of the SAR that is available on Cameco's community website.

4.5 Physical Design

PHCF is required to have a program for physical design of the facility to assess the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and manage changes to ensure that safety is maintained.

4.5.1 Facility Design

Site details are provided in Section 2.2. The licensed areas are secured by a metal fence that encloses the entire perimeter other than the front of the main building.

Modifications to the facility are made in accordance with the *National Building Code of Canada*, 2020 edition, the *National Fire Code of Canada*, 2020 edition and *National Fire Protection Association*, CSA N393-22, *Fire protection for facilities that process, handle, or store nuclear substances.*

4.5.2 Facility and Process Changes

PHCF's Process and Design Change Control, CQP 113 describes the process used to identify and manage changes at site in a manner appropriate to the type and significance of the change. All changes to the facility's design and equipment are reviewed and documented throughout Cameco's Management of Change (MOC) process. The MOC process involves subject matter experts and identifies potential implications with respect to operability, health and safety and the environment, including any regulatory and/or code implications.

4.5.3 Third Party Review for Fire Protection

Modifications for which the initial assessment indicates a potential impact on fire protection design basis, goals, or criteria are subject to a qualified third-party review in accordance with CSA N393. All third-party reviews are conducted by qualified persons from organizations whose management and financial operations are independent of the design organization. All third-party fire reviews are submitted to CNSC staff as required by the licence and LCH.

4.5.4 Pressure Boundary Program

As required by the operating licence, the PHCF maintains an agreement with an Authorized Inspection Agency (AIA) for the registration, inspection and other activities related to pressure systems. The Technical Standards and Safety Authority (TSSA) is the AIA for the PHCF. The TSSA approves the quality control program that governs the shop fabrication, field installation, assembly, repairs and erection of piping systems as well as repairs and alterations of boilers and pressure vessels, piping and fittings in accordance with applicable codes.

The Pressure Boundary Program, which meets the requirements of CSA B51-19, *Boiler, pressure vessel, and pressure piping code*, establishes the infrastructure and defines the activities necessary to maintain a sustainable process that allows PHCF to perform activities associated with repairs, replacements, modifications and alterations to pressure retaining items, components, and systems including installation of new systems.

Licensee documents associated with the Pressure Boundary Program include: CQP – 501, In Service Inspection of Safety Significant Systems, Structures/Components; CQP - 706, Pressure and Safety Significant Piping and Vessel Control and CQP – 707, Registration and Inspection of Pressure Piping and Pressure Vessels.

4.6 Fitness for Service

PHCF has a Preventative Maintenance program, CQP-701, for the facility, which includes a program for the periodic inspection and testing for the facility. This area includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

4.6.1 Maintenance Program

The PHCF has an established preventative maintenance program as described in Preventative Maintenance, CQP-701. All preventative maintenance work is initiated and documented through the work notification system in SAP. For safety significant systems, structures and components, preventive maintenance plans are reviewed and updated periodically. The site maintenance program ensures that equipment functions as designed over its lifetime so that safety systems remain available, meet the design intent in the safety report and that equipment failures are minimized. This is accomplished by completion of corrective and preventative maintenance activities along with routine inspections on system components to ensure that they remain in good operating condition.

4.6.2 In-service Inspection Program

PHCF has an in-service inspection program that applies to piping and vessels in the safety significant systems. Technicians performing the inspections are certified in accordance with the Canadian General Standards Board. Inspection methods (e.g. ultrasonic or liquid penetrant) have been selected based on the historical record of operation and inspection at the PHCF. These methods have been determined to be the most appropriate for detecting potential problems and for revealing the type of deterioration most likely to occur as a result of the service conditions to which the equipment is subjected.

4.6.3 Periodic Inspection and Testing for Fire Protection Systems

Fire protection systems are tested according to an established schedule developed using the *National Building Code*, 2020 edition and *National Fire Code*, 2020 edition. Reviews of

aspects of the fire protection systems are completed as required by CSA N393-22: *Fire protection for facilities that process, handle, or store nuclear substances.*

4.7 Radiation Protection Program

In accordance with the *Radiation Protection Regulations*, PHCF maintains a detailed radiation protection program for the facility as outlined in the Radiation Protection Program Manual (PHF-MAN-RAD). Radiation protection measures are in place to minimize and control the potential for radiation exposure to both workers and members of the general public arising from the PHCF operations.

The PHF-MAN-RAD describes written procedures used to ensure that radiation exposures and doses are kept as low as reasonably achievable (ALARA), social and economic factors taken into account, through the implementation of:

- Management control over work practices
- Personnel qualification and training
- Control of occupational and public exposure to radiation
- Planning for unusual situations

Radiation exposure for workers is monitored through a comprehensive dosimetry program that includes monitoring for internal and external radiation exposures. Radiation exposure for the public is part of the Environmental Protection Program and is calculated based upon the derived release limit (DRL) as described in section 4.9.

4.7.1 Potential Radiological Hazards

Radiation hazards at PHCF are primarily associated with natural, and to a lesser degree depleted and enriched uranium and the associated decay products and impurities. The hazards associated with natural uranium are of greater concern due to the quantities received, processed and produced at the facility. Exposure can be from beta or gamma radiation outside the body, or alpha, beta or gamma radiation from inside the body as a result of inhalation, ingestion or absorption through the skin of uranium bearing materials. While both external and internal radiation hazards are found at the facility, the potential risk associated with internal hazards are of more significance. Working in the presence of uranium, internal exposure can result from inhalation, ingestion or contamination of an open wound. The primary hazards are chemical toxicity effect to the kidney, radiation dose to the bone, and radiation dose to the lung.

4.7.2 Nuclear Energy Worker (NEW) Designation

Employees or contractors that have a reasonable probability of receiving a radiation dose greater than 1 mSv are designated as Nuclear Energy Workers (NEWs). As required by the *Radiation Protection Regulations*, all NEWs are notified in writing of this designation,

the risks associated with radiation that they may be exposed to in the course of their work and of the applicable effective and equivalent dose limits. Female NEWs are also notified in writing of their rights and obligations related to pregnancy, including the requirement for female NEWs to inform Cameco, in writing, that they are pregnant.
All NEWs receive training from Cameco in radiation safety when first hired or returning to work after an extended absence. Cameco also requires annual refresher training. To support the radiation protection and occupational health and safety monitoring programs, employees will receive a medical examination at the time of hire. Medical surveillance examinations are then conducted on a periodic basis. Contractors designated as NEWs may be given a medical appraisal by the occupational health nurse depending on the nature and duration of their work.

4.7.3 Radiation Protection Control Measures

Radiation protection controls and measures at the PHCF to ensure radiation exposures and doses are kept at as low as reasonably achievable (ALARA) levels are described in the PHF-MAN-RAD and associated site documents and procedures. PHCF's procedures for radiation protection cover areas including, but not limited to, individual exposure monitoring, in-plant air monitoring, zone control, contamination control, radioisotope control, use of radiation meters and calibration of radiation monitoring and sampling equipment.

Permanent air sampling stations are located throughout the facility. Stations are located in process areas where there is a higher likelihood of airborne uranium dust being present and are operated on a continuous basis. The air sampling stations serve to assist in identifying process upsets, equipment breakdowns or other instances of loss of containment. Cameco uses real-time uranium in air monitoring at the PHCF to alert workers when respiratory protection is required.

Regular gamma surveys of the plant and storage areas are performed and areas with dose rates above 25 μSv/h are posted. This posting informs workers that the time spent in this area should be minimized.

Maintenance work requires a safety clearance, which may trigger the completion of a radiation work permit where additional controls to minimize dose may be required, based upon factors such as the equipment, nearby nuclear devices, high gamma areas or the duration of the work.

Supervisors are responsible for ensuring their employees follow all radiation safety procedures including zone control procedures, proper use of protective clothing and devices, contamination control and proper waste disposal.

In terms of protecting the public, the RP program prevents the uncontrolled release of contamination or radioactive materials from the site by controls and monitoring of people and materials.

Table 3: Radiation Protection Controls

Parameter	Period	Action Levels
Whole Body Exposure (NEW)	Monthly	2.0 mSv
	Quarterly	2.0 mSv
	Monthly – Pregnant Worker (NEW)	1.0 mSv
	Cumulative Does During Pregnancy – Pregnant Worker (NEW)	2.0 mSv
Skin Exposure (NEW)	Monthly	15 mSv
	Quarterly	15 mSv
Eye Dose (NEW)	Monthly	6.0 mSv
	Quarterly	12.0 mSv
Urinalysis (NEW)	Bi-Weekly – UO_2/UF_6 Operators, Maintenance, Technical Support	65 µg U/L
	Monthly – Administrative Support	25 µg U/L
	Bi-Weekly – Long-term Contractors	65 µg U/L
	Daily – Short-term Contractors	80 µg U/L
	Chemical Toxicity – Post Shift Sample	500 µg U/L
	Fluoride Toxicity – All Samples	7 mg F/L
Urinalysis (Non-NEW)	Daily – Routine Sample	40 µg U/L
	Chemical Toxicity – Post Shift Sample	500 µg U/L
	Fluoride Toxicity – All Samples	4 mg F/L
Lung Counting (NEW)	Semi-Annual – UO_2/UF_6 Operators, Maintenance	5.0 mSv
	Annual – Technical Support	5.0 mSv
	Administrative Support (as required)	5.0 mSv
	Long-term and Short-term Contractors (as required)	5.0 mSv

4.7.4 Personal Dosimetry

The dose assignment to NEWs working at the PHCF consists of both external and internal dose components. The effective dose is the sum of their external whole body dose as measured by dosimeter badges plus internal dose assigned from uranium in urine plus internal dose assigned from lung burden and is reported to the NEWs on an annual basis. Each of the three components of the personal dosimetry program is described below.

External exposures are monitored using a CNSC-approved licensed dosimetry service provider. As discussed in further detail below, Cameco's Fuel Services Division maintains an internal dosimetry service licence issued by the CNSC for the urine analysis and lung counting programs.

4.7.5 External Dosimetry

Individually assigned dosimeters are used to determine external dose as both deep-dose (whole body) equivalent and shallow (skin) dose equivalent exposure from external sources of radiation. Eye dose is also determined using a pro-rating algorithm. The external dosimetry service for Cameco is provided through a CNSC approved external dosimetry service provider. PHCF has set action levels that are approved by CNSC staff and referenced in the PHF-MAN-RAD and in the appropriate radiation protection procedures to trigger investigation of unusual radiation exposure. Extremity dose measurements may also be performed using ring-type personal dosimeters that are processed by the external dosimetry service provider. Due to the nature of the work at PHCF, there is low probability of high extremity dose and routine use of ring dosimeters is not required.

Table 4: Action Levels for External Dosimetry

External Dosimetry Parameter	Frequency	Administrative Level (mSv)	Regulatory Action Level (mSv)
Whole Body Exposure	Monthly	1.2	2.0
	Monthly – Pregnant Worker	0.3	1.0
	Monthly – Pregnant Worker (Cumulative dose during pregnancy)	1.0	2.0
	Quarterly	1.2*	2.0
Skin Exposure	Monthly	8.3	15.0
	Quarterly	8.3	15
Lens of an Eye Exposure	Interim Monthly**	4.0	6.0
	Interim Quarterly**	8.0	12.0
* Quarterly frequency OSLDs not monthly totaled in a quarter ** Interim action levels pending the completion of eye dose studies to derive more accurate algorithm from OSLD dose and acceptance by the CNSC staff.			

4.7.6 Internal Dosimetry

Cameco's Fuel Services Division holds a licence from the CNSC (11010-34.0) that authorizes Cameco to provide internal dosimetry services to the PHCF, Blind River Refinery and Cameco Fuel Manufacturing. The internal dosimetry program meets the requirements of CNSC Regulatory Document REGDOC-2.7.2, *Dosimetry, Volume II: Technical and Management System Requirements for Dosimetry Services*. Additional

information regarding this program may be found in Cameco's FSD Internal Dosimetry Program Technical Basis Document (TBD).

Internal dose is assessed and assigned through two programs – urine analysis and lung counting. As described in the TBD, routine dose assignment through the urine analysis program assumes that the acute exposure occurred to a fast (soluble) type of uranium material. Routine dose assignment based on measured lung burden assumes chronic exposure to a combination of medium (slightly soluble) and slow (insoluble) type of uranium material. When the source of the exposure to a NEW is known (e.g. due to a process upset), the non-routine dose assignment is completed using specific solubility parameters to that material.

4.7.7 Urine Analysis

All employees and contractor NEWs are required to submit routine urine samples for the analysis of uranium and (depending on their work area), fluorides. Routine urine samples that meet the criteria specified in the TBD are used to calculate and assign dose to the worker. Any urine result exceeding 13 µg U/L is screened by the radiation protection personnel to validate the sample and - when applicable - initiate investigation into an abnormal intake as defined in the PHF-MAN-RAD. Urine analysis action levels, which were accepted by CNSC staff, are documented in the PHF-MAN-RAD and are appropriate to the sample type and submission frequency.

4.7.8 Lung Counting

The dose assessment of uranium in lungs is based on measurement using a germanium detector-based lung counting system. A group-counting technique is used for dose assignment where all NEWs in a similar work group who are below the decision level (DL) are assigned a dose based on the average exposure for the group. The frequency of lung counting of NEWs is based on the work group to which the worker belongs and is described in the PHF-MAN-RAD.

Individuals with lung count results above the DL are assigned a dose based on their individual measurement and their measurement is not included in the group average. The dose from lung counting is assigned to NEWs annually as part of their annual dose report. Individuals with confirmed lung burden above the DL are informed of their dose after completing their lung count and investigation is initiated into the cause.

Employees with low risk for internal exposure (e.g. administration and technical support staff) and contractor NEWs have their lung-based internal dose pro-rated using the average dose of the measured group(s) and time spent in exposure areas.

4.7.9 Radiation Protection Dose Limits and Action Levels

Maximum permissible doses and action levels are documented in the PHF-MAN-RAD. Worker exposures are tracked on a monthly basis by the radiation protection team.

4.7.10 Zone Control – Contamination Control

The PHCF maintains zone control and monitoring programs as described in the PHF-MAN-RAD to identify areas of potential contamination and prevent the spread of contamination from these areas. There are three aspects to maintaining contamination control:

- Controlling contamination at the source,
- Containing and controlling radioactive and contaminated materials,
- Monitoring to verify the effectiveness of contamination control.

The site has been delineated into three control zones, and the zones are simply referred to as Zone 1, Zone 2 and Zone 3. The possibility of contamination increases with an increasing zone number.

4.7.11 Radioisotope Control

The facility uses a number of radioisotopes that are regulated under the *Nuclear Substances and Radiation Devices Regulation*. Cameco maintains a record of the specific radioisotope sources on site that are present above an exemption quantity, the radioisotope used and the maximum activity of the device as described in the PHF-MAN-RAD and the associated procedures. These sources range in type from nuclear gauges and static eliminators to laboratory calibration sources and tracer solutions. This information is available to CNSC inspectors when they are on site.

The controls associated with sealed sources, unsealed sources and radiation devices (including x-ray equipment) are described in the PHF-MAN-RAD and associated procedures and include training, certification (where required), leak testing, radiation warning signs and limited access to areas where sources are stored.

4.7.12 Planning for Non-Routine Incidents

The PHF-MAN-RAD outlines the triggers for an investigation related to a non-routine radiation protection incident. Examples would be:

- Contamination identified outside of the production areas
- Routine monitoring of product or equipment leaving site above release levels as described in the PHF-MAN-RAD
- Personal dosimetry results above the administrative or regulatory action levels set out in the PHF-MAN-RAD

- Injury with potential for uranium contamination of the wound
- Airborne release of uranium within a production area as identified by routine monitoring

The level of investigation is determined by the significance of the event, as defined by Cameco's corrective action process.

Screening, administrative and action levels have been established to verify urine samples and trigger investigations for potentially significant intakes, both from a radiological and chemical toxicity point of view. Formal dosimetry investigations involve verification of the sample, reviewing the workplace conditions, tasks performed and personal protective equipment used by the worker. A temporary removal from a production area may be required to collect additional urine samples, a lung count and/or other follow-up as determined by radiation protection personnel or medical personnel. Dose is assigned in accordance with Cameco's dosimetry program licensed by the CNSC or individually performed non-routine dose assessment.

Corrective actions from dosimetry and/or contamination incidents are used to strengthen the radiation protection program at the facility. Planning for and responding to specific non-routine situations that may occur at the facility is also addressed in various radiation protection, fire safety and emergency response documentation.

4.8 Conventional Health and Safety

This safety and control area covers the implementation of a program to manage non-radiological workplace safety hazards and to protect personnel and equipment. A key element of a safe, clean and reliable operation is a comprehensive and well-established worker protection program, which has been in place for many years at the PHCF. The foundation of the program is based on the NSCA and its regulations as well as Part II of the *Canada Labour Code*.

4.8.1 Conventional Safety Program

The health and safety management program fosters and promotes a strong sustainable safety culture with a safe, healthy and rewarding workplace. Cameco has five key principles in the area of safety that form the framework of how safety is managed. These are:

- safety is our first priority;
- we are all accountable for safety;
- safety is part of everything that we do;
- safety leadership is critical to Cameco Corporation; and
- we are a learning organization.

The health and safety of workers at PHCF is ensured through the Occupational Health and Safety Management Program Manual, PHF-MAN-OHS, which meets the requirements of REGDOC-2.8.1 *Conventional Health and Safety.* Key components of the program include:

- compliance with all safety and health-related legal and regulatory requirements;
- the setting of site safety and health objectives;
- the implementation of corporate safety standards;
- the development and maintenance of a formal hazard recognition, risk assessment and change control processes; and
- the documentation of health and safety significant incidents from the start through to the verification of completion of corrective actions via the CIRS database.

PHCF has a safety charter (the Charter) in place detailing our employees' commitment to safety. Each employee is asked to sign the Charter to demonstrate their personal commitment to safety. As new employees are hired, Cameco explains the Charter to them and requests they sign the Charter. A copy of the Charter with all employee signatures is posted at the PHCF entrance.

4.8.2 Hazards

PHCF is a Class IB nuclear facility and a chemical processing plant. There are radiological hazards associated with the various forms of uranium found at the facility as well as chemical hazards from process chemicals, including: bulk quantities of anhydrous hydrogen fluoride, aqueous hydrofluoric acid, fluorine, hydrogen, aqua ammonia, nitric acid, phosphoric acid, and smaller quantities of laboratory chemicals, water treatment chemicals and materials used for maintenance activities.

There are also a variety of physical hazards that are monitored and controlled at the site, such as heat, lighting, noise, vibration, traffic and extreme weather.

These hazards are identified in various site documentation and procedures.

4.8.3 Work Controls

All site personnel have a general awareness of the occupational health and safety hazards that exist at the site and the various means of minimizing these risks. All groups attend regular department safety meetings where workers are encouraged to discuss safety issues or concerns. Safety awareness, training and re-training are done through in-class sessions, safety meetings, and computer-based training depending on the topic as described in section 4.2.1

Hazardous materials are labeled or identified to meet applicable regulations. The proper identification of hazardous materials decreases the likelihood of improper use, handling and disposal, which reduces potential risks and negative consequences. Purchasing

procedures are in place for the procurement of chemicals. Safety Data Sheets (SDS) are requested from vendors for each type of chemical purchased. SDS information has also been developed for all of the uranic materials on site. SDS information is available and managed through an online database.

Work instructions, procedures, job hazard analysis (JHA), task analysis safety cards (TASC Card), hazard identification risk assessment and control (HIRAC), safety clearances and hazard specific clearances, are some of the tools used to identify and control hazards in the workplace.

Personal protective equipment (PPE) is provided as necessary and is specified in the work instruction, JHA or clearance for the job. All PPE is approved by the SHEQ department to ensure that the correct PPE is available for each job. Chemical resistant gloves, chemical goggles and/or face shields, chemical suits and disposable coveralls are available for safe chemical handling. Half mask, full-face mask and supplied air respiratory protection with appropriate respirator cartridges are available for tasks where inhalation of uranium, chemicals and/or dust is possible. PHCF's use of respiratory protection meets the requirements of CSA Z94.4-11 *Selection, use and care of respirators*.

In addition to air-purifying respirators, process and emergency response personnel are trained in the use of self-contained breathing air (SCBA) apparatus.

Personal and area monitoring is performed to assess workplace exposures. These include in-plant uranium in air levels, fluoride levels in occupational areas and urine analysis programs for fluoride and uranium. Monitoring for other parameters (e.g. asbestos, lead in paint, heat, lighting etc.) is performed on an "as needed" basis.

The requirements for a Policy Health and Safety Committee (PHSC) and a Workplace Health and Safety Committee (WHSC) of the *Canada Labour Code Part II* are met by the Conversion Safety Steering Committee (CSSC). This committee is an employee driven safety committee with subcommittees focusing on specific safety topics. The CSSC reviews and discusses matters involving OH&S policies, procedures and programs, safety performance, safety program performance, work refusals, safety related projects, and joint union/management OH&S issues that may arise from time to time. It was established in 2013 and meets monthly to address safety performance and safety culture. One meeting per month is specifically dedicated to the health and safety committee requirements in the *Canada Labour Code Part II*. Time is allotted, actions are reviewed, issues discussed, and minutes are maintained separately to address the code requirements of both a PHSC and WHSC. The CSSC is active in promoting continuous improvement that supports the site moving towards an injury-free workplace.

4.9 Environmental Protection

PHCF is required to have in place an environmental protection program that identifies, controls and monitors all releases of radioactive and hazardous substances from the facility.

4.9.1 Environmental Protection Program

The PHCF maintains an Environmental Protection Program (EPP) that meets the requirements of CNSC REGDOC-2.9.1: *Environmental Protection: Environmental Principles, Assessments and Protection Measures (Version 1.2),* as well as the following CSA environmental standards:

- *CSA N288.1, Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*
- *CSA N288.4, Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*
- *CSA N288.5, Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*
- *CSA N288.6, Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*
- *CSA N288.7, Groundwater protection programs at Class I nuclear facilities and uranium mines and mills*
- *CSA N288.8, Establishing and implementing action levels for releases to the environment from nuclear facilities.*

The following Licensing Basis documents also apply:

- REGDOC – 3.1.2, *Reporting Requirements, Volume 1: Non-Power Reactor Class 1 and Uranium Mines and Mills*

The FSD Environmental Management System, FSD-PGR-EMS-001 (EMS) describes the higher tier program elements that meet the requirements of the ISO 14001:2015 Environmental Management System – Requirements with guidance for use standard and applicable CSA N288 series standards. The site's EPP describes site-specific aspects associated with the environmental sampling that is carried out in support of the EMS and the Environmental Risk Assessment (ERA). This monitoring data is then compared to applicable action levels and limits to ensure operations remain in compliance with applicable regulations and licence limits.

4.9.2 Environment Risk Assessment

PHCF maintains an ERA in accordance with the requirements of CSA N286.6: *Environment Risk Assessments at Class 1 Nuclear Facilities and Uranium Mines and Mills*. The 2016 ERA found there were no undue risks to the environment or to human health as

a result of facility operations. A summary of the ERA and a redacted version of the ERA are available on the Cameco community website. In accordance with N288.6-12, a review of the ERA was carried out in 2024 which determined that conditions were consistent with the conclusions reached in 2016. This review determined that a full update of the ERA would be required following the completion of the VIM project. An additional review will be carried out in 2025 to assess changes carried out under VIM since the last review to support this licence application.

4.9.3 Environmental Regulation

Airborne and liquid effluent discharge quality is defined and regulated by federal and provincial regulators. For Cameco, the main federal regulatory agencies are the CNSC and ECCC. Provincial regulation is by the Ontario MECP. The acts (and associated regulations) enforced by these agencies include the *NSCA, Canadian Environmental Protection Act, 1999, Fisheries Act, Ontario Water Resources Act* and the *Environmental Protection Act*. PHCF must also comply with applicable municipal bylaws.

The facility maintains the following approvals from MECP:

- MECP PTTW P-300-5055667864, Water taking – groundwater (wells and excavations)
- MECP ECA 1310-CK5MMH – Revised storm sewer works associated with the Vision in Motion project execution and the transition from once-through cooling water works
- MECP ECA 2229-9FFK9G – Air and noise emissions

4.9.4 Airborne Emission Program

The Emission Summary and Dispersion Modelling Report (ESDM) documents the air emissions sources at the PHCF and maintains the most current listing of all stacks/sources, their specifications and parameters emitted as required by the provincial ECA for air emissions. The majority of emissions from facility operations are discharged through the UF_6 main stack, UO_2 stack and the UO_2 SCR stack. The airborne effluent monitoring program is focused on these three stacks while the respective areas of the plant are operating.

Source Monitoring

The EPP describes the source monitoring program in detail. Uranium emissions from the UF_6 main stack are sampled nearly continuously during operations using a TSI sampler. HF emissions from the UF_6 main stack are continuously monitored by an on-line analyzer.

The UO_2 main stack is sampled for uranium and ammonia using an impinger train. The UO_2 selective catalytic reduction (SCR) stack is sampled during depleted UO_2 operations for nitrogen oxides and ammonia.

In-plant uranium in air concentrations are determined through continuous and or fixed air sampling systems. Using exhaust information such as fan flow rate, HEPA filter reductions and in-plant air monitoring associated with specific exhaust fans, building ventilation emissions are estimated.

Validation of Cameco's emissions and samplers is completed by compliance testing conducted by an independent third-party expert. These sources are tested using approved sampling protocols outlined by the United States Environmental Protection Agency (US EPA), Environment and Climate Change Canada (ECCC) and Ontario Source Testing Code (OSTC) for licensed parameters.

Total site emissions are documented and compared against point of impingement standards in the site ESDM report, which is reviewed by the MECP annually. The ESDM predicts contaminant concentrations from the facility at the facility fence line and into the community using a developed worst-case emission scenario and an air dispersion model that meets the requirements of O. Reg. 419 and the ECA for the facility.

Ambient Monitoring

The atmospheric environmental monitoring program is intended to collect data for uranium and fluoride to assess whether airborne emissions from the PHCF may be detected at offsite locations in the vicinity of the facility. This is used to support PHCF operations in the event of an upset condition, to support validation of existing air dispersion models and periodic review of the ERA. The current program uses high volume (hi-vol) air samplers, lime candles and dustfall to assess ambient air quality.

The high volume (hi-vol) air-sampling program monitors the concentration of uranium suspended in the air near the facility. Approximately 40 cubic feet per minute of air is passed through and collects on a filter over a 24-hour period. There is no regulated standard for uranium content in hi-vol monitoring.

Fluorination rate is an indirect measurement of the gaseous fluoride concentration in the ambient air. An established method for measuring the fluoride concentration in ambient air is to expose lime (calcium oxide) coated filter papers, commonly called lime candles, for a fixed period of time. The fluoride reacts with the lime, and the analysis of the lime candles provides a time-averaged fluoride concentration. The lime candles are prepared, deployed and collected on a specific frequency and are analyzed. The period of time is normally 30 days; however, weekly periods are also used.

Dustfall monitoring is a measurement of deposition rate and is obtained by collecting particulate matter in a container, termed a dustfall jar. The particulate matter is collected over a one-month period and analyzed to determine the uranium deposition rate. In addition to the uranium analysis, the fluoride content of the collected dust provides information on fluoride in air near the facility.

4.9.5 Sanitary Sewer Monitoring

Primary inputs to the sanitary sewer are grey water and black water sources, powerhouse effluent and condensates. Sampling of the sanitary sewer discharge is achieved through an automated composite sampler at the discharge from the facility. Uranium and pH are determined daily. Other parameters required by the MPH Sewer Use Bylaw 30/94 are determined annually.

4.9.6 Environmental Monitoring – Water

The environmental monitoring program for water includes the collection of surface water (currently inactive until completion of the PHAI remedial work in the harbour), stormwater and groundwater.

The surface water program (when active) is run quarterly at locations in the harbour and approach channel. Thirteen locations at two depths are collected and analyzed for uranium, arsenic, ammonia, nitrate, fluoride and radium. This program is currently suspended due to harbour remediation activities being undertaken by CNL.

The stormwater program is run semi-annually with samples at up to 6 storm drains. These are analyzed for uranium, arsenic, ammonia, nitrate, fluoride and radium.

Groundwater is collected at on-site monitoring wells. The program includes monthly, quarterly, annual and biennial sampling at various monitoring wells across the site for uranium, arsenic, ammonia, nitrate, fluoride and radium. In addition, and dependent on the sampling schedule samples are also collected for petroleum hydrocarbons and a VOCs suite.

4.9.7 Terrestrial and Other Monitoring Programs

The terrestrial environmental monitoring program is intended to collect data for uranium (as an indicator of all emissions) to assess whether airborne effluent emissions from the PHCF are accumulating in soil.

Soil Monitoring

In order to support the periodic review of the ERA, Cameco collects soil samples at two designated locations on an annual basis. This program is currently a limited program due to interferences from PHAI remedial activities. Following the completion of the PHAI and VIM projects, Cameco has committed to developing a new soil monitoring program for Port Hope.

Vegetation Monitoring
The vegetation monitoring program is managed in conjunction with the MECP. Locations and the types of vegetation are selected with the MECP. A qualitative and quantitative (fluoride concentration) is undertaken on the collected composites.

Noise
Noise assessment, measurement and acoustic modeling is undertaken at the facility. This is reviewed as part of the Acoustical Assessment Report under provincial regulations.

Gamma Monitoring
Gamma radiation emissions from the licensed sites can cause radioactive dose to members of the public via external gamma radiation exposure. Fenceline gamma measurements are performed around the facility each month using optically stimulated luminescence dosimeters (OSLD).

4.9.8 Estimated Dose to the Public

The derived release limit (DRL) for a given radionuclide is defined as the release rate that would cause an individual of the most highly exposed group to receive and be committed to a dose equal to the regulatory annual dose limit of 1 mSv. As part of the periodic review of the DRL, the most exposed receptor locations for each receptor activity is determined to identify the critical receptor. A person located at this receptor, given their proximity to the facility and the theoretical length of time that could be spent at this location, would be expected to receive the highest possible radiation dose that any member of the public could receive.

The DRL for PHCF was revised in 2025 and is based on three components: dose to the public from air emissions, dose from sanitary sewer discharges and dose from gamma radiation. For PHCF, dose to the public from air and water emissions are a very small fraction of the public dose limit and the gamma component represents virtually all the estimated public dose. The critical receptor is an adult who lives on Alexander Street and carries out other recreational activities near the PHCF.

The DRL has been submitted to the CNSC for their review and acceptance. It's Cameco's intention to update the release limits based on this report during the next licence period.

4.9.9 Setting of Authorized Release Limits for Air Emissions and Sanitary Sewer Effluent

Release limits for radionuclides have previously been established set based upon the DRL for the facility. To support this application, the proposed licence limits utilize Exposure-Based Release Limits (EBRL) methodology. EBRLs are concentration-based release limits that are based on meeting endpoint parameters which consider radiotoxicity, chemical toxicity, and protection of aquatic life.

The EBRL has been submitted to the CNSC for their review and acceptance. It's Cameco's intention to update the release limits based on this report during the next licence period.

The existing environmental release limits for this licence period are shown in Tables 5, 6, and 7.

4.9.10 Setting of Action Levels

CSA N288.8-17 *Establishing and implementing action levels for release to the environment from nuclear facilities* details that action levels are considered for the releases of contaminants or physical stressors, which are measured at the final discharge point as part of an effluent monitoring program or estimated using upstream measurements. For PHCF, action levels are emission rates (for air) or a concentration (for water) that when reached, might indicate a potential loss of control of part of the environmental protection program and will require specific action to be taken.

PHCF established action levels following the guidance of N288.8-17, which were accepted by CNSC staff.

Table 5: Action Levels for Airborne Emissions

Release Source	Parameter	Limit	Action Level	Averaging Period
UF_6 Main Stack	Uranium	280 g/h	40 g/h	Daily
	HF	650 g/h	230 g/h	Daily
UO_2 Main Stack	Uranium	240 g/h	10 g/h	Daily
	NH_3	58 kg/h	10 kg/h	Daily
UO_2 Plant Depleted Operations Stack (SCR)	NOx	78 kg/h	n/a	Daily

Table 6: Action Levels for Sanitary Sewer

Source	Substance	Limit	Action Level	Averaging Period/Monitoring Frequency
Sanitary Sewer	pH	6.0 & 9.5		Daily
	Uranium	275 ug/L		Monthly Mean
	Uranium		150 ug/L	Monthly Mean/Daily

Table 7: Limits for Gamma Emissions

Parameter	Limit	Frequency
PHCF Main Site TLD 2	0.57 µSv/h	Monthly
PHCF Main Site TLD 10	0.61 uSv/h	Monthly
Dorset Street Site TLD 21	0.26 uSv/h	Monthly

4.9.11 Reporting of Environmental Information

PHCF makes information related to the environment and the public available through a variety of methods. Quarterly and annual compliance reports that are submitted to the CNSC are posted to the community website, and a record of spills and other events that may be of interest to the public is also maintained on the website. Cameco also provides its Quarterly Compliance Monitoring and Operational Performance Report and Annual Compliance Report interested parties as described in section 2.4. Additional updates are provided to the Municipality when requested.

4.10 Emergency Management and Fire Protection

PHCF is required to maintain an emergency preparedness plan and a fire protection program to ensure that licensed activities do not result in an unreasonable risk to the health and safety of persons and the environment.

4.10.1 Emergency Response Plan

The PHCF Emergency Response Plan (ERP) is compliant with the requirements of REGDOC 2.10.1: *Nuclear Emergency Preparedness and Response*. In addition to the ERP,

there are a number of other site documents that provide additional emergency response information, including information specific to emergency response related training.

The ERP assigns specific accountabilities and sets out processes and procedures to protect the health and safety of workers, contractors, the public and the environment in the case of an emergency. It outlines the actions to be taken to respond to emergencies including response team assembly, personnel accounting, event classification, emergency hazard monitoring, and the treatment of casualties as well as the return of the facility to normal operations.

In addition to the ERP, Standard Operating Guidelines (SOGs) and Pre-incident Plans (PPs) provide additional emergency response information. These documents outline the requirements for training, drills and exercises as well as emergency response facilities and equipment and interface with off-site organizations and community notification in event of an emergency.

In addition to the CNSC licensing requirements, ECCC and the MECP have requirements related to emergency planning and spill prevention. The federal *Environmental Emergency Regulations* identify specific chemicals and quantity levels that require the facility to develop release scenarios and conduct drills at prescribed frequencies as part of an Environmental Emergencies Plan (E2 Plan). Ontario Regulation 224/07 *Spill Prevention and Contingency Plans* requires the site to maintain a site-specific Spill Prevention and Contingency Plan (SPCP) as a resource for preventing, detecting and responding to spills. The E2 Plan and SPCP complement the site ERP.

4.10.2 Emergency Preparedness and Response Elements

Depending on type and magnitude of an incident, the site may activate any or all of the following response organizations for the protection of human health, the environment and property: Emergency Response Team (ERT), Emergency Response Organization (ERO), Local Crisis Management Team, and Corporate Crisis Management Team. Each of these elements has a manual and/or procedures or guidance documents to ensure that the organizational response to an emergency situation is systematic and meets the regulatory requirements commensurate with the nature of the emergency.

4.10.3 Emergency Response Team

The PHCF ERT consists of approximately sixty-five employees, and includes employees trained in firefighting (NFPA 600), Hazmat (1072), and Confined Space Rescue (NFPA 1006). There are ERT personnel on each Security and process crew, as well as on dayshift. There is a minimum of four ERT members, and one incident commander on site always when the facility is operating.

A mutual aid agreement has been signed by the Municipality of Port Hope Protective Services and Cameco. The commitment for assistance by the Municipality provides an additional layer of support to the facility's emergency response capability. In addition, Cameco provides the Municipality with support, either financial or through the donation of equipment, and conducts joint training exercises with the Municipality so that in the event of an emergency at the facility requiring off-site assistance, there will be a coordinated and effective response.

4.10.4 Exercises and Drills

PHCF completes a minimum number of drills and training exercises (tabletop and full simulations) each year to test the ERP and provides the members of the various EROs to improve and sustain their emergency response capability. Drills and exercises are an opportunity for continual improvement through the development and implementation of recommendations from previous drills and exercises, audits and inspections, lessons learned from external incidents and other sources of corrective actions or opportunity for improvement. Tabletop exercises, drills and full simulations are used for the following purposes:

- Tabletop Exercises - round table discussions of a potential emergency situation. They are developed to practice elements of the ERP and structured to meet the specific objectives identified. Tabletop exercises will be conducted a minimum of once every three years.

- Drills - are hands-on activities that test a certain element of the emergency response system, such as facility evacuation and census. The drills are based on realistic scenarios that could impact the facility. They involve activating personnel to handle the described emergency. Personnel will be required to respond to an evolving emergency event run on real time. Drills are completed quarterly and may be utilized in training/qualification of ERT members, involve a subset of the facility or ERO and/or be coordinated with a full simulation exercise.

- Full Simulations – to test the complete emergency response organization. An actual incident is staged, and the complete organization is mobilized to deal with it. Community resources are invited to participate in the exercise simulation. PHCF will conduct a full simulation exercise to test specific elements of the ERP at least once every three years.

4.10.5 Emergency Response Assistance Plan

Cameco also has an Emergency Response Assistance Plan (ERAP) that is approved by Transport Canada, pursuant to federal transportation of dangerous goods requirements, and applies to transportation emergencies. Transportation activities related to the shipping and

receiving of goods at or from PHCF are included in the plan. Cameco reviews and updates the ERAP, as required.

4.10.6 Fire Protection Program

The Fire Protection Program (FPP), CQP 1200 has been developed and implemented to comply with the requirements of the National Fire Code, National Building Code, and with CSA N393-22: *Fire Protection for facilities that process, handle, or store nuclear substances.*

The FPP consists of the following main elements: the Fire Hazard Analysis (FHA), the Fire Safety Plan (FSP), CQP 1201, Pre-incident Plans and related fire safety procedures. These documents are reviewed and updated on a periodic basis by qualified personnel, as required.

Routine inspections and testing of the fire protection system are conducted by or under the direction of Cameco personnel. Cameco has a system that is in place to enable detection of a fire and notification of personnel. Emergency pull stations are located strategically throughout the facility. Areas with potential fire hazards are equipped with appropriate fire detection and/or suppression systems. Fire safety equipment is maintained with the use of preventive maintenance and periodic inspections.

4.10.7 Fire Hazards Analysis

PHCF maintains a site Fire Hazards Analysis (FHA) that meets the requirements of CSA N393-22, *Fire Protection for Facilities that Process, Handle or Store Nuclear Substances* and supporting reference materials. The FHA evaluates the impact of fire on the facility and demonstrates that the fire protection objectives can be met under foreseeable fire events. To satisfy this objective, safety significant systems and equipment as well as fire hazards have been identified. An analysis has been made of the potential for a worst-case fire event to impact safety related systems and equipment.

4.10.8 Fire Safety Plan

The FSP is a key element of the site's Fire Protection Plan and is intended to be a companion document to the site FHA. While the objective of the FHA of the site buildings is to identify fire hazards and fire protection features intended to meet nuclear and life safety requirements, the objective of the FSP is to define the administrative controls required to maintain fire safe conditions and help the occupants in utilizing life safety features in the buildings, ensure an orderly evacuation at the time of an emergency and provide a maximum degree of flexibility to achieve the necessary fire safety for the buildings.

The following controls are documented in the FSP:

- Fire protection systems;
- Inspection, testing and maintenance program;
- Impairments;
- Fire separations;
- Emergency response plan;
- Emergency organization; and,
- Pre-incident plans.

4.10.9 Emergency or Fire Recovery Plan

The emergency recovery plan will depend on the nature of the emergency situation, i.e., whether the emergency is local (within the plant), external (off-site) or a transportation event. Depending on the situation, the recovery plan may require regulatory review and approval. Recovery plans would be developed to minimize the impact to personnel involved in the clean-up, the environment and the general public. Guidance on what is to be included in a recovery plans is provided in the ERP.

4.11 Waste Management

PHCF is required to maintain a waste management program at the facility which covers the internal waste-related programs that 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.

4.11.1 Waste Management Program

The waste management program for PHCF is described in the FSD Waste Management Program, FSD-PGR-WM-01, site Waste Management Program, WMP-01 and Clean Up Program, WMP-02. The program meets the requirements for management of radioactive waste in solid, liquid or gaseous states as defined by CSA Standard N292.3-14 *Management of low- and intermediate-level radioactive waste*, CSA Standard N292.0-14 *General principles for the management of radioactive waste and irradiated fuel* and for hazardous waste as defined by Ontario Regulation 347 General – *Waste Management*.

The program is also compliant with REGDOC 2.11.1, *Waste Management, Volume 1: Management of Radioactive Wastes.*

The waste management activities at PHCF are conducted with the following objectives:

- To manage and dispose of wastes in accordance with applicable laws and generally accepted industry practices so as to minimize the potential adverse impact to personnel and to the environment;

- To minimize and reduce the quantity of stored onsite waste through recycle, re-use and recovery to the extent possible;
- To segregate radioactively contaminated and non-contaminated waste materials;
- To maintain an inventory of waste materials produced, received, disposed of and stored, including quantities and location on site;
- To store waste materials only when re-use, recycle or recovery is not possible and then to do so with proper management systems and controls in place; until an acceptable method has been identified for their eventual disposal; and
- To continually evaluate disposal alternatives and new technologies for waste reductions.

4.11.2 Current PHCF Waste Streams

Recoverable Uranium Materials

The conversion facility sends suitable natural uranium material from the PHCF to the BRR for uranium recovery. In addition, the facility produces fluoride product, which is sent to a uranium mill for recovery of the uranium. Other natural uranium scrap materials may also be sent to a uranium mill for recovery of the uranium to the fuel cycle. This prevents these materials from becoming waste.

Conventional Waste

The facility also has processes in place for the collection, storage and disposal of non-contaminated, non-hazardous waste materials, such as cardboards, plastics, clean chemical drums and lunchroom refuse. Materials that are sent to conventional landfill or recycling are scanned to ensure they are free of uranium contamination prior to release from the facility.

Contaminated Waste Materials (Radioactive Waste)

Radiologically contaminated waste materials contaminated are stored on-site or at the 158 Dorset Street property and are appropriately managed.

Drums or other packages containing contaminated solid material are stored pending characterization and disposal. Qualifying wastes that meet the Waste Acceptance Criteria (WAC) are sent to Long-Term Waste Management Facility (LTWMF) located in Port Hope and operated by Canadian Nuclear Laboratories (CNL). Non-qualifying wastes are sent to an appropriately licensed facility in the United States subject to meeting the WAC of that facility.

Drums containing contaminated liquid wastes are stored inside bermed areas inside Building 5. These materials require further processing prior to uranium recovery and/or disposal at an appropriately permitted facility.

Some materials, such as metal vessels, may be decontaminated on-site and the material released for recycle. Other wastes will require additional stages of characterization,

processing and/or determination of an appropriate outlet for disposal or recycling. All radiologically contaminated waste materials will remain in safe, secure storage until acceptable permanent disposal or recycle options have been identified.

Hazardous Waste Materials

Non-contaminated hazardous waste materials are managed and disposed of in accordance with the requirements under the provincial waste management regulation, O. Reg. 347. Cameco maintains a Generator Registration Number (ON0008200) for a small number of hazardous waste classes that are registered through the MECP Resource Productivity Recovery Authority (RPPA) Hazardous Waste Program Registry.

4.12 Security

PHCF maintains a security program to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment or prescribed information.

4.12.1 Security Plan

PHCF's Security Plan presents an overview of the security operations at PHCF and identifies the systems and processes in place to meet security program objectives. The Security Plan meets the requirements of REGDOC-2.12.3 *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2*. Accordingly, this document is considered prescribed information and is subject to the requirements of the *General Nuclear Safety and Control Regulations*. The objective of the PHCF Security Plan is to ensure safe and secure operation of the facility, by maintaining protection through use of equipment, personnel, and procedures. The PHCF Security Plan has continued to evolve in order to meet all regulatory requirements and commitments over the period of the current operating licence.

4.13 Safeguards and Non-Proliferation

PHCF is required to have a program in place that ensures all obligations arising from the Canada/International Atomic Energy Agency (IAEA) Safeguards agreement are met. The objective of the Canada-IAEA safeguards agreements is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are for peaceful uses and that there is no diversion to nuclear weapons or other nuclear explosive devices or an indication of undeclared nuclear materials or activities.

4.13.1 International Obligations

PHCF complies with 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*. Safeguards involves inspection and

other verification activities undertaken by the IAEA to evaluate compliance with obligations under safeguards agreements with the IAEA.

4.13.2 Inventory and Reporting

PHCF complies with REGDOC 2.13.1 *Safeguards and Nuclear Material Accountancy* as described in FSD Safeguards Program (FSD-PGR-SG-01). The facility maintains a natural uranium inventory system in which receipts and shipments are recorded. Monthly inventory reports are distributed to the CNSC that include safeguarded natural uranium as well as the inventory of non-safeguarded material.

PHCF completes an annual Physical Inventory Taking (PIT) as part of the FSD Safeguards Program, which is followed by a Physical Inventory Verification (PIV) with the IAEA or a Physical Inventory Taking Evaluation with the CNSC. Short Notice Random Inspections (SNRIs) of the facility are conducted by the IAEA periodically throughout the year to ensure compliance with safeguards obligations.

4.14 Handling, Storing, Packaging and Transport

PHCF is required to have a packaging and transport program that meets the requirements set out in the *Packaging and Transport of Nuclear Substances Regulations, 2015* and the *Transportation of Dangerous Goods Act* and regulations.

4.14.1 Packaging and Transport Program

As described in the FSD Packaging and Transportation Program (FSD-PGR-TRN-001), Cameco maintains corporate standards and site procedures that cover the safe packaging and transport of nuclear substances to and from its licensed facilities. All radioactive materials are transported in a package designed for its' contents. The contents, isotopic level and physical/chemical properties will determine the type of package.

The site has procedures related to the handling, storing, loading, transporting and receipt of nuclear substances and other dangerous goods. Employees are trained in the safe handling, packaging and shipping of dangerous goods commensurate with their responsibilities.

UO_2 is packaged in UN traceable open head steel drums with a bolted ring closure (typically a 55 US gallon drum). UF_6 is shipped in cylinders type 48X, 48Y or 30B by road or road/marine to other customers worldwide. All of these containers meet the Type IP-1 packaging requirements with the exception of 30B cylinders which are B(U)F certification compliant.

If required by the *Nuclear Non-proliferation Import and Export Control Regulations*, an import or export licence is obtained from the CNSC prior to shipment and corresponding import or export permits are also obtained from Global Affairs Canada.

Other materials, such as laboratory samples, other uranium-containing materials, and wastes (conventional, hazardous, radioactive or mixed) are packaged and safety marks applied in accordance with the appropriate regulations.

4.15 Nuclear Facility Specific Areas of Interest

4.15.1 Site Clean Up Program

PHCF has established a Clean-Up Program (CUP) for the purpose of reducing environmental liabilities, addressing health and safety hazards in underutilized buildings, creating useable space and improving the appearance of the facility. This program covers the removal of obsolete buildings, equipment, contaminated soils, building materials, and wastes at the facility. This program is described in WMP-02 Clean Up Program, the Supplemental VIM Submission and the Supplementary Monitoring Plant for Vision in Motion and other Clean-Up Program Projects. These documents describe the work carried out under this program; the roles, responsibilities and qualifications and training required to carry out this work; and other steps undertaken by the licensee to carry out this work safely and in a manner that provides adequate provision of protection to workers and the environment.

For the VIM project, PHCF will submit information for CNSC staff review and feedback in advance of starting any large or non-routine scope of work as described in WMP-02.

4.15.2 Nuclear Liability Insurance

As required by the operating licence and associated LCH, the PHCF maintains valid nuclear installation liability insurance and annually provides proof of this insurance to CNSC staff.

4.15.3 Criticality Safety and Quantity of Fissionable Material

The Nuclear Criticality Safety Program Manual (NCSPM) has been developed to meet the requirements of REGDOC-2.4.3, *Nuclear Criticality Safety*.

The NCSPM applies to operations including research, storage and special projects involving small quantities of fissionable materials (less than 80% of the Smallest Critical Mass (SCM)) and operations including research, storage and special projects involving large quantities of fissionable material (greater than 80% of the SCM). Any activities involving large quantities of enriched material requires special handling as outlined in the NCSPM as well as review and acceptance of project-specific safety and operating procedures by CNSC staff.

Appendix 1: Standards and Guidance Relevant to the Safety and Control Areas

This appendix lists the REGDOCs, standards and other regulatory documents listed in the LCH for the facility. Compliance Verification Criteria (CVC) imply implementation of the requirements of the document as they are used by CNSC staff to verify and oversee PHCF's compliance with the licence conditions. Guidance is non-mandatory information on how PHCF may comply with the licence conditions. New revisions to existing CVC or guidance documents or new REGDOCs or standards may be added throughout the term of the licence in accordance with the CNSC regulatory framework.

SCA	Document Title	Document Reference	CVC or Guidance	Status
General	Regulatory Fundamentals	REGDOC-3.5.3 (2018)	Guidance	N/A
Management System	Management System Requirements for Nuclear Facilities	CSA N286-12 (R2017)	CVC	Implemented
	Management System	REGDOC-2.1.1 (2019)	Guidance	N/A
	Commentary on N286-12, Management systems requirements for nuclear facilities	CSA N286.0.1 (2014	Guidance	N/A
	Safety Culture	REGDOC-2.1.2 (2018)	CVC	Implemented
	Public Information and Disclosure	REGDOC-3.2.1 (2018)	CVC	Implemented
Human Performance Management	Personnel Training, Version 2	REGDOC-2.2.2 (2016)	CVC	Implemented
	Minimum Staff Complement	REGDOC-2.2.5 (2019)	Guidance	N/A
	Human Performance, Version 2	REGDOC-2.2.1 (2023)	Guidance	N/A

SCA	Document Title	Document Reference	CVC or Guidance	Status
Operating Performance	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2 (2018)	CVC	Implemented
Safety Analysis	Safety Analysis for Class 1B Nuclear Facilities	REGDOC-2.4.4	CVC	October 2025
	Safety of Nuclear Fuel Cycle Facilities	IAEA SSE 4 (2017)	Guidance	N/A
Physical Design	National Building Code of Canada 2020	NRCC 56190	CVC	Implemented
	National Fire Code of Canada 2020	NRCC 56192	CVC	Implemented
	Fire Protection for Facilities that Process, Handle or Store Nuclear Substances	CSA N393-22	CVC	Implemented
	General Design Considerations: Human Factors	REGDOC-2.5.1 (2019)	Guidance	N/A
	Boiler, pressure vessel, and pressure piping code	B51 2019	CVC	Implemented
Fitness for Service	National Fire Code of Canada 2020	NRCC 56192	CVC	Implemented
	Fire Protection for Facilities that Process, Handle or Store Nuclear Substances	CSA N393-22	CVC	Implemented
Radiation Protection	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2 (2018)	CVC	Implemented
	Radiation Protection	REGDOC-2.7.1 (2021)	Guidance	N/A
	Dosimetry, Volume I: Ascertaining Occupational Dose	REGDOC-2.7.2 (2021)	Guidance	N/A
	Selection, use and care of respirators	CSA Z94.4-18	CVC	Implemented

SCA	Document Title	Document Reference	CVC or Guidance	Status
Conventional Health and Safety	Conventional Health and Safety	REGDOC-2.8.1 (2019)	Guidance	N/A
Environmental Protection	Environmental Principles, Assessments and Protection Measures, version 1.2	CNSC REGDOC 2.9.1 (2020)	CVC	Implemented
	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2 (2018)	CVC	Implemented
	Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities	CSA N288.1-14 (R2019)	CVC	Implemented
	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	CSA N288.4-10 (R2015)	CVC	Implemented
	Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	CSA N288.5-11 (R2016)	CVC	Implemented
	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	CSA N288.6-12 (R2017)	CVC	Implemented
	Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills	CSA N288.7-15 (2015)	CVC	Implemented
	Establishing and implementing action levels for releases to the environment from nuclear facilities	CSA N288.8-17 (2017)	CVC	Implemented
Emergency Management and Fire Protection	Nuclear Emergency Preparedness and Response	REGDOC 2.10.1 (2016)	CVC	Implemented
	National Building Code of Canada 2020	NRCC 56190	CVC	Implemented

SCA	Document Title	Document Reference	CVC or Guidance	Status
	National Fire Code of Canada 2020	NRCC 56192	CVC	Implemented
	Fire Protection for Facilities that Process, Handle or Store Nuclear Substances	CSA N393-22	CVC	Implemented
Waste Management	General Principles for the Management of Radioactive Waste and Irradiated Fuel	CSA N292.0-19 (2019)	CVC	Implemented
	Management of Low- and Intermediate –level Radioactive Waste	CSA N292.3-14 (2014)	CVC	Implemented
	Waste Management, Volume 1: Management of Radioactive Waste	REGDOC 2.11.1	CVC	Implemented
	Decommissioning of Facilities Containing Nuclear Substances	CSA N294-19 (2019)	CVC	Implemented
	Decommissioning	REGDOC-2.11.2 (2021)	CVC	Implemented
	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1	CVC	Implemented
Security	Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	REGDOC-2.12.3 (2020)	CVC	Implemented
Safeguards and Non-Proliferation	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1 (2018)	CVC	Implemented
Packaging and Transport	Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2	REGDOC-2.14.1 (2021)	Guidance	N/A

Appendix 2: Documents Supporting the Licence Application

PHCF has identified the following documents to be relevant to supporting this application for the renewal of its Fuel Facility Operating Licence (FFOL-3631.00/2027)

Document Title	Document Type	Available on Website
Safety, Health, Environment and Quality Policy	Corporate Policy	Yes
Facility Licensing Manual (FLM)	Site Program	Yes
Management System Program Manual (MSPM)	Site Program	Description in FLM
Port Hope Training Program (TP-01)	Site Program	Description in FLM
Radiation Protection Program (PHF-MAN-RAD)	Site Program	Description in FLM
Environmental Protection Program	Site Program	Description in FLM
Occupational Health and Safety Management System Program Manual (PHF-MAN-OHS)	Site Program	Description in FLM
Fire Safety Plan (CQP-1201)	Site Program	Description in FLM
Waste Management Plan (WMP-01)	Site Program	Description in FLM
Clean-Up Program (WMP-02)	Site Program	Description in FLM
Internal Dosimetry Technical Basis Document	Divisional Program	No
Public Information Program, FSD-PGR-PIP-001	Divisional Program	Summary available
FSD Environmental Management System, FSD-PGR-EMS-001	Divisional Program	No
FSD Waste Management Program, FSD-PGR-WM-01	Divisional Program	Summary available
FSD Safeguards Program, FSD-PGR-SG-01	Divisional Program	No
FSD Packaging and Transportation, FSD-PGR-TRN-01	Divisional Program	No
Facility Licensed Area Drawing, PHCF Layout Site 1	Site Drawing	A version is available in the FLM

Document Title	Document Type	Available on Website
PHCF Site 2 – Dorset Street	Site Drawing	A version is available in the FLM
Radioisotope Source Control (CQP-RAD-13)	Site Procedure	No
Process and Design Change Control (CQP-113)	Site Procedure	No
Design Control Procedure, PR 33	Site Procedure	No
Quality Control Manual for TSSA Certificates of Authorization	Site Procedure	No
Preventative Maintenance (CQP-701)	Site Procedure	No
Authorized Inspection Agency Services Agreement	Procurement Document	No
Security Plan (SecurityPlan001)	Site Plan	No
Emergency Response Plan (ERP)	Site Plan	No
Fire Hazard Analysis	Site Plan	No
Spill Prevention and Contingency Plan	Site Plan	No
Environmental Aspects Registry	Site Plan	No
Safety Report for PHCF	Supporting Study	Summary Available
Derived Release Limit	Supporting Study	Summary Available
Fire Protection Plan (CQP-1200)	Supporting Study	No
Environmental Risk Assessment	Supporting Study	Yes
Review of Environmental Action Levels to Support the Environmental Protection Program	Supporting Study	No
Preliminary Decommissioning Plan	Supporting Study	Summary Available
Nuclear Criticality Safety Program Manual	Site Program	No

Document Title	Document Type	Available on Website
Supplementary Environmental Monitoring Plan for Vision In Motion and Other Clean-Up Program Projects (EMP-VIM)	Site Program	No
Supplementary VIM Submission (VIM Description)	Site Program	No

Appendix 3: List of Acronyms Used in the Application

Acronym	Meaning
ADU	Ammonium Diuranate
AHF	Anhydrous Hydrogen Fluoride
AIA	Authorized Inspection Agency
ALARA	As low as reasonably achievable
Cameco	Cameco Corporation
CAMRAD	Cameco Radiation protection database
CFM	Cameco Fuel Manufacturing Inc.
CIRS	Cameco Incident Reporting System
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
C of A	Certificate of Approval
CSA	Canadian Standards Association
CVC	Compliance Verification Criteria
DRL	Derived Release Limit
EBRL	Exposure Based Release Limits
ERL	Eldorado Resources Ltd
ENL	Eldorado Nuclear Limited
E2	Environmental Emergency
ECCC	Environment and Climate Change Canada
ECA	Environmental Compliance Approval
EMS	Environmental Management System
EPP	Environmental Protection Program
ERA	Environmental Risk Assessment
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESDC	Department of Employment and Social Development Canada
ESDM	Emission Summary and Dispersion Model
F_2	Fluorine
FFOL	Fuel Facility Operating Licence
FHA	Fire Hazards Analysis
FLM	Facility Licensing Manual
FPP	Fire Prevention Program
FSD	Fuel Services Division
FSP	Fire Safety Plan

Acronym	Meaning
GNSCR	*General Nuclear Safety and Control Regulations*
H_2	Hydrogen
HAZOP	Hazards and Operability
HHRA	Human Health Risk Assessment
Hi-vol	High volume air sampler
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
JHA	Job Hazard Analysis
LCH	Licence Conditions Handbook
LTWMF	Long-Term Waste Management Facility
MECP	Ontario Ministry of the Environment, Conservation and Parks
MOL	Ontario Ministry of Labour
MSPM	Management System Program Manual
mSv	Millisievert
NEW	Nuclear Energy Worker
NOx	Nitrogen oxide
NSCA	*Nuclear Safety and Control Act*
NSRDR	*Nuclear Substance and Radiation Devices Regulations*
O. Reg.	Ontario Regulation
OSLD	Optically stimulated luminescence dosimetry
OSTC	Ontario Source Testing Code
PDP	Preliminary Decommissioning Plan
PHCF	Port Hope Conversion Facility
PIDP	Public Information and Disclosure Program
PIT	Physical Inventory Taking
PIV	Physical Inventory Verification
PP	Pre-incident Plan
POI	Point of Impingement
PPE	Personal Protective Equipment
PTTW	Permit to Take Water
REGDOC	CNSC regulatory document
RSPM	Radiation Safety Program Manual
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SHEQ	Safety, Health, Environment and Quality
SNRI	Short Notice Random Inspection

Acronym	Meaning
SOG	Standard Operating Guideline
SPCP	Spill Prevention and Contingency Plan
SAR	Safety Analysis Report
TBD	Technical Basis Document
TED	Total Effective Dose
TSSA	Ontario Technical Standards and Safety Authority
UF_4	Uranium Tetrafluoride
UF_6	Uranium Hexafluoride
UO_2	Uranium dioxide
UO_3	Uranium trioxide
µg	microgram
US EPA	United States Environmental Protection Agency
VIM	Vision in Motion

Appendix 4: Licence Renewal Application Requirements Matrix

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Pursuant to subsection 3 of the General Nuclear Safety and Control Regulations Licences – General Application Requirements

Section 3. the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements **(1) An application for a licence shall contain the following information:**	**Location in Application or Supporting Document(s)**
(a) the applicant's name and business address;	Application Sections 1.1
(b) the activity to be licensed and its purpose;	Application Sections 1.3 and 2.3 Facility Licensing Manual
(c) the name, maximum quantity and form of any nuclear substance to be encompassed by the licence;	Application Sections 1.3, 2.3 and 4.3.1
(d) a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence;	Application Sections 1.3 and 2.3
(e) the proposed measures to ensure compliance with the Radiation Protection Regulations, the Nuclear Security Regulations and the Packaging and Transport of Nuclear Substances Regulations, 2015;	Documents referenced in Appendix 2 Supporting Documents - FSD-PGR-TRN-01, Security Plan001, FSD-PRC-RAD-04, PHF-MAN-RAD, ERP, and FLM
(f) any proposed action level for the purpose of section 6 of the Radiation Protection Regulations;	Application Sections 4.7.3, 4.7.5
(g) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment or prescribed information;	Application Sections 4.7 and 4.12 Supporting Documents - FLM, PHF-MAN-RAD, Security Plan001
(h) the proposed measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information;	Application Section 4.12 Supporting Documents - Security Plan001
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	Application Sections 4.4, 4.7, 4.9 and 4.11 Supporting Documents - FLM, DRL, ERA, SAR
(j) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;	Application Sections 4.4 and 4.11 Supporting Documents - FLM, SAR, FSD-PGR-WM-01, WMP-01, and WMP-02

Section 3. the *General Nuclear Safety and Control Regulations* Licences – General Application Requirements **(1) An application for a licence shall contain the following information:**	**Location in Application or Supporting Document(s)**
(k) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the Act and the regulations made under the Act, including the internal allocation of functions, responsibilities and authority;	Application Sections 2.1 and 4.1.1 Supporting Documents - FLM
(l) a description of any proposed financial guarantee relating to the activity to be licensed; and	Application Sections 2.5 Supporting Documents - PDP
(m) any other information required by the Act or the regulations made under the Act for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.	All relevant information is contained within the application, the FLM and supporting documents referenced in the application and FLM.

Pursuant to subsection 3(1.1) of the General Nuclear Safety and Control Regulations and Other Information Requested by CNSC Staff

Subsection 3(1.1)[1] of the *General Nuclear Safety and Control Regulations and* Other Information Requested by CNSC Staff	**Location in Application or Supporting Document(s)**
Summary of programs and supporting documentation needed to support the licence application organized under each SCA, including other matters of regulatory interest (see Attachment 1). The programs and supporting documentation should be sufficiently detailed to describe the safety and control measures that will be implemented at the facility for each SCA.	Application Section 4.0 (incl. 4.1 – 4.14) Application Appendix 2 Facility Licensing Manual
Description of Cameco PHCF's approach to safety, including reference to corporate and facility specific documents which enunciate the safety policies and standards to which Cameco PHCF must adhere.	Application Section 4.8 Supporting Documents – PHF-MAN-OHS

[1] The Commission or a designated officer authorized under paragraph 37(2)(c) of the Act, may require any other information that is necessary to enable the Commission or the designated officer to determine whether the applicant: (a) is qualified to carry on the activity to be licensed, or (b) will, in carrying on 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.

Subsection 3(1.1)[1] of the *General Nuclear Safety and Control Regulations and* Other Information Requested by CNSC Staff	Location in Application or Supporting Document(s)
Documents describing the organizational structure, roles and responsibilities of organizational units and management, including documents governing the day-to-day operation and conduct of the organization.	Application Sections 2.1 and 4.1.1 Supporting Documents - FLM
Information on PHCF's performance for each SCA during the current licence period, relative to Cameco's expectations, including any trends	Application Appendix 5
Assessment of existing and future safety challenges, along with a safety improvement plan to address these challenges during the next licence period	Application - Appendix 5 Section 1.4
Describe opportunities for improvements and any safety improvement plans to address identified safety challenges	Application - Appendix 5 Section 1.4
A description of the proposed operating plan for the next licensing period	Application Sections 3.2 and 4.3 Appendix 5 Section 1.3
Information on significant activities envisaged beyond the end of the next licensing period, if any	No known significant activities beyond the next licensing period
Provide a list of federal, provincial, municipal or other regulations, other than the regulations pursuant to the NSCA, which Cameco PHCF must abide by	Application Section 4.9.3 Supporting Documents – EPP
Provide a description of any obligations for municipal, provincial or other federal authorities and any obligations for public and/or private organizations.	Application Sections 4.3 and 4.9.3 Supporting Documents – EPP
Provide a self-assessment to determine if the licence applications could have any new adverse impacts on Indigenous or treaty rights and therefore raise the duty to consult and trigger the requirements of REGDOC-3.2.2, *Indigenous Engagement*. REGDOC-3.2.2 also outlines what to consider when conducting this activity.	Application Section 2.4
Provide a description of outreach activities to engage Indigenous groups and members of the public with respect to licence renewal.	Application Section 2.4 Supporting Documents – FSD-PGR-PIP-01
Provide a list of any permits, certificates and licences issued by authorities other than the CNSC.	Application Section 4.9.3 Supporting Documents – EPP

Subsection 3(1.1)[1] of the *General Nuclear Safety and Control Regulations and* Other Information Requested by CNSC Staff	Location in Application or Supporting Document(s)
Provide updated Derived Release Limits and Operating Release Limit reports for the facility	Letter from V. Jamnicky (Cameco) to M. Jones (CNSC), subject: Update to Derived Release Limits (DRL) for the Port Hope Conversion Facility, September 26, 2025.
Provide Cameco's plans and schedule, including dates, with respect to complying with each of the standards, codes and CNSC regulatory documents required for implementation as per Attachment 1 (unless recommended to be included under recommendations and guidance), including transition measures as appropriate.	Already addressed in current LCH. Additional comments in the performance report.
Summary of the current status of all open actions items, as well as issues and requests that were discussed during the last PHCF Commission hearings or meetings, including a plan and date for resolution.	Cameco will update the SAR and revalidate the ERA in Q4 2025.
A description of any planned major facility modification projects during the proposed licence period, including the schedule for these projects and, if known, the hazards associated with these projects and the safety and control measures Cameco will plan to implement to mitigate those hazards.	No major facility modifications planned during the next licence period.

Pursuant to subsection 5 of the General Nuclear Safety and Control Regulations: Licences – Application for Renewal of Licence

Subsection 5 of the *General Nuclear Safety and Control Regulations* – Application for Renewal of Licence **5. An application for the renewal of a licence shall contain**	**Location in Application or Supporting Document(s)**
(a) The information required to be contained in an application for that licence by the applicable regulations made under the Act; and	Application and identified supporting documentation.
(b) A statement identifying the changes in the information that was previously submitted.	

Pursuant to subsection 15 of the General Nuclear Safety and Control Regulations: Obligations – Representatives of Applicants and Licensees.

Subsection 15 of the *General Nuclear Safety and Control Regulations:* Obligations – Representatives of Applicants and Licensees **15. Every applicant for a licence and every licensee shall notify the Commission of**	**Location in Application or Supporting Document(s)**
(a) The persons who have authority to act for them in their dealings with the Commission;	Application Sections 2.1 and 4.1.1 Supporting Documents - FLM
(b) The names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence; and	Application Sections 2.1 and 4.1.1 Supporting Documents - FLM
(c) Any change in the information referred to in paragraphs (a) and (b), within 15 days after the change occurs.	FLM

Pursuant to subsection 3 of the Class I Nuclear Facilities Regulations: Licence Applications – General Requirements

Subsection 3 of the *Class I Nuclear Facilities Regulations:* Licence Applications – General Requirements **3 An application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the General Nuclear Safety and Control Regulations:**	**Location in Application or Supporting Document(s)**
(a) A description of the site of the activity to be licensed, including the location of any exclusion zone and any structures within that zone;	Application Section 2.2 Supporting Documents – Drawing No. 99101 sheet 71, Drawing No. 99101 sheet 73
(b) Plans showing the location, perimeter, areas, structures and systems of the nuclear facility	Supporting Documents – Drawing No. 99101 sheet 71, Drawing No. 99101 sheet 73
(c) evidence that the applicant is the owner of the site or has authority from the owner of the site to carry on the activity to be licensed;	Copies of relevant deeds and leases have previously been submitted to the CNSC and are available upon request
(d) the proposed management system for the activity to be licensed, including measures to promote and support safety culture;	Application Section 4.1.3 Supporting Documents – FLM, MSPM
(d.1) the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty.	Application Section 4.2 Supporting Documents – FLM, TP01
(e) the name, form, characteristics and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on;	Application Section 4.4, 4.4.1, 4.8.2 Supporting Documents – FLM, SAR, ERA, DRL
(f) the proposed worker health and safety policies and procedures;	Application Section 4.8 Supporting Documents – PHF-MAN-OHS
(g) the proposed environmental protection policies and procedures;	Application Section 4.9 Supporting Documents – FSD-PGR-EMS-001, EPP
(h) the proposed effluent and environmental monitoring programs;	Application Section 4.9 Supporting Documents – FSD-PGR-EMS-001, EPP

Subsection 3 of the *Class I Nuclear Facilities Regulations:* **Licence Applications – General Requirements** **3 An application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the General Nuclear Safety and Control Regulations:**	**Location in Application or Supporting Document(s)**
(i) If the application is in respect of a nuclear facility referred to in paragraph 2(b) of the *Nuclear Security Regulations*, the information required by section 3 of those Regulations;	Not applicable to PHCF
(j) the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed; and	Application Section 2.4 Supporting Documents – FSD-PGR-PIP-01
(k) the proposed plan for the decommissioning of the nuclear facility or of the site.	Application Sections 2.5 Supporting Documents – FLM, PDP

Pursuant to subsection 6 of the Class I Nuclear Facilities Regulations: Licence Applications – Licence to Operate

Subsection 6 of the *Class I Nuclear Facilities Regulations:* Licence Applications – Licence to Operate An application for a licence to operate a Class I nuclear facility shall contain the following information in addition to the information required by section 3:	**Location in Application or Supporting Document(s)**
(a) a description of the structures at the nuclear facility, including their design and their design operating conditions;	Application Sections 2.2, 2.3, 4.4, 4.5 and 4.6 Supporting documents – FLM, SAR, PHCF-MAN-AMR Detailed information on specific structures and their design and operation was previously submitted to the CNSC (AECB) at the time the structures were commissioned.
(b) a description of the systems and equipment at the nuclear facility, including their design and their design operating conditions;	Application Sections 2.2, 2.3, 4.4, 4.5 and 4.6 Supporting documents – FLM, SAR, PHCF-MAN-AMR Detailed information on specific structures and their design and operation was previously submitted to the CNSC (AECB) at the time the structures were commissioned.
(c) a final safety analysis report demonstrating the adequacy of the design of the nuclear facility;	Application Section 4.4 Supporting documents – FLM, SAR
(d) the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility;	Application Sections 4.1, 4.2, 4.3, 4.5, and 4.6 Supporting documents – FLM, MSPM and referenced documents
(e) the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances;	Application Sections 4.2, 4.3, 4.7, and 4.14 Supporting documents – FLM, FSD-PGR-TRN-01, PH-MAN-RAD
(f) the proposed measures to facilitate Canada's compliance with any applicable safeguards agreement;	Application Section 4.13 Supporting documents – FLM, FSD-PGR-SG-01

Subsection 6 of the *Class I Nuclear Facilities Regulations:* Licence Applications – Licence to Operate An application for a licence to operate a Class I nuclear facility shall contain the following information in addition to the information required by section 3:	**Location in Application or Supporting Document(s)**
(g) the proposed commissioning program for the systems and equipment that will be used at the nuclear facility;	Application Sections 4.1 and 4.5 Supporting documents – FLM, MSPM
(h) the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects;	Application Sections 4.4, 4.7 and 4.9 Supporting documents – FLM, ERA, SAR, DRL
(i) The proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical and radiological characteristics;	Application Sections 4.4 and 4.9 Supporting documents – FLM, SAR, ERA, DRL, EPP
(j) the proposed measures to control releases of nuclear substances and hazardous substances into the environment;	Application Sections 4.4 and 4.9 Supporting documents – FLM, SAR, ERA, DRL, EPP
(k) the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, SAR, ERA, DRL, EPP, CQP 1200, CQP 1201
(i) Assist off-site authorities in planning and preparing to limit the effects of an accidental release,	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, SAR, ERA, DRL, EPP, CQP 1200, CQP 1201, ERP
(ii) Notify off-site authorities of an accidental release or the imminence of an accidental release,	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, EPP, ERP
(iii) Report information to off-site authorities during and after an accidental release,	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, EPP, ERP

Subsection 6 of the *Class I Nuclear Facilities Regulations:* Licence Applications – Licence to Operate An application for a licence to operate a Class I nuclear facility shall contain the following information in addition to the information required by section 3:	**Location in Application or Supporting Document(s)**
(iv) Assist off-site authorities in dealing with the effects of an accidental release, and	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, EPP, ERP
(v) Test the implementation of the measures to prevent or mitigate the effects of an accidental release;	Application Sections 4.4, 4.9 and 4.10 Supporting documents – FLM, EPP, ERP
(l) the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility, including measures to alert the licensee to such acts	Application Section 4.12 Supporting documents – Security Plan001
(m) The proposed responsibilities of and qualification requirements and training program for workers, including the procedures for the requalification of workers; and	Application Section 4.2 Supporting documents – FLM, TP01
(n) The results that have been achieved in implementing the program for recruiting, training and qualifying workers in respect of the operation and maintenance of the nuclear facility.	Application Section 4.2 Supporting documents – FLM, TP01

Pursuant to Subsection 3 of the Nuclear Substances and Radiation Devices Regulations: Licence Applications – General Requirements

Subsection 3 of the *Nuclear Substances and Radiation Devices Regulations:* Licence Applications – General Requirements **3(1) An application for a licence in respect of a nuclear substance or a radiation device, other than a licence to service a radiation device, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*:**	**Location in Application or Supporting Document(s)**
(a) the methods, procedures and equipment that will be used to carry on the activity to be licensed;	Application Sections 2.3, 4.4, 4.7, 4.9 and 4.10 Supporting documents – FLM, PHF-MAN-RAD, EPP, ERP
(b) The methods, procedures and equipment that will be used while carrying on the activity to be licensed, or during and following and accident, to	Application Sections 4.7 and 4.9 Supporting documents – FLM, PHF-MAN-RAD, EPP, ERP
(i) Monitor the release of any radioactive nuclear substance from the site of the activity to be licensed,	
(ii) Detect the presence of and record the radiation dose rate and quantity in bequerels of radioactive nuclear substances at the site of the activity to be licensed,	Application Sections 4.7 and 4.9 Supporting documents – FLM, PHF-MAN-RAD, EPP, ERP
(iii) Limit the spread of radioactive contamination within and from the site of the activity to be licensed, and	Application Sections 4.7 and 4.9 Supporting documents – FLM, PHF-MAN-RAD, EPP, ERP
(iv) Decontaminate any person, site or equipment contaminated as a result of the activity to be licensed;	Application Sections 4.7 and 4.9 Supporting documents – FLM, PHF-MAN-RAD, EPP, ERP
(c) a description of the circumstances in which the decontamination referred to in subparagraph (b)(iv) will be carried out;	Application Sections 4.4, 4.7, 4.9, 4.10, 4.11 Supporting documents - FLM, PHF-MAN-RAD, EPP, ERP, FSD-PGR-WM-001

Subsection 3 of the *Nuclear Substances and Radiation Devices Regulations:* Licence Applications – General Requirements **3(1) An application for a licence in respect of a nuclear substance or a radiation device, other than a licence to service a radiation device, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*:**	**Location in Application or Supporting Document(s)**
(d) The proposed location of the activity to be licensed, including a description of the site;	Application Section 2.2 Supporting Documents - Drawing No. 99101 sheet 71, Drawing No. 99101 sheet 73
(e) The roles, responsibilities, duties, qualifications and experience of workers	Application Section 4.2 Supporting documents – TP01
(f) The proposed training program for workers;	Application Section 4.2 Supporting documents – TP01
(g) The proposed instructions for dealing with accidents, including fires and spills, in which the nuclear substance may be involved;	Application Sections 4.4, 4.7, 4.9, 4.10 Supporting documents – FLM, PHF-MAN-RAD, EPP, FSD-PGR-WM-001, CQP 1200, CQP 1201
(h) The proposed inspection program for the equipment and systems that will be used to carry on the activity to be licensed;	Application Sections 4.4, 4.7, 4.9, 4.10 Supporting documents – FLM, PHF-MAN-RAD, EPP, FSD-PGR-WM-001, CQP 1200, CQP 1201
(i) The methods, procedures and equipment that will be used to calibrate radiation survey meters in accordance with these Regulations;	Application Section 4.7 Supporting documents – PHF-MAN-RAD and referenced procedures
(j) The methods, procedures and equipment that will be used to calibrate and verify the calibration of dosimeters referred to in paragraphs 30(3)(d) and €;	Application Section 4.7 Supporting documents – PHF-MAN-RAD and referenced procedures
(k) The methods, procedures and equipment that will be used to conduct the leak tests and surveys required by those Regulations;	Application Section 4.7 PHF-MAN-RAD and referenced procedures
(l) Where the application is in respect of a nuclear substance that is in an unsealed source and that is to be used in a room , the proposed design of the room;	Application Section 4.7 PHF-MAN-RAD and referenced procedures

Subsection 3 of the *Nuclear Substances and Radiation Devices Regulations:* Licence Applications – General Requirements **3(1) An application for a licence in respect of a nuclear substance or a radiation device, other than a licence to service a radiation device, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*:**	**Location in Application or Supporting Document(s)**
(m) If the application is in respect of a nuclear substance that is contained in a radiation device, the brand name and model number of the radiation device, and the quantity of the devices;	Application Section 4.7 Supporting documents PHF-MAN-RAD and referenced procedures es
(n) Where the application is in respect of Category I, II or III nuclear material, as defined in section 1 of the *Nuclear Security Regulations*,	PHF-MAN-NCS
i. The measures that will be taken to prevent nuclear criticality	
ii. The information required by section 3 or 4 of the *Nuclear Security Regulations*, as applicable;	
(o) If the applicant will be manufacturing or distributing radiation devices referred to in paragraph 5(1)© or section 6 or 7, or check sources mentioned in section 8.1, the proposed procedure for the disposal of each radiation device or check source for its return to the manufacturer	Not applicable

Pursuant to Part 2 of the Nuclear Security Regulations: Part 1 Security of Nuclear Facilities Listed in Schedule 2 – Licence Applications

Subsection 41 of the *Nuclear Security Regulations:* Licence Applications – General Requirements	**Location in Application or Supporting Document(s)**
An application for a licence in respect of a nuclear facility shall contain, in addition to the information required by sections 3 to 8 of the *Class I Nuclear Facilities Regulations*, a description of the physical protection measures to be taken to ensure compliance with sections 42 to 48.	Application Section 4.12 Supporting documents – Security Plan001

Appendix 5: 2027 LICENCE RENEWAL APPLICATION FOR THE PORT HOPE CONVERSION FACILITY FFOL-3631.00/2027

CAMECO CORPORATION
FUEL SERVICES DIVISION

2027 LICENCE RENEWAL APPLICATION
FOR THE
PORT HOPE CONVERSION FACILITY

FFOL-3631.00/2027

APPENDIX 5

1.0 INTRODUCTION

1.1 Background

As described within this report, the performance of this facility over the current and license period demonstrates that Cameco is qualified to carry out the activities permitted under the License for a period of 20 years. This report reaffirms Cameco's commitment to take all reasonable precautions to protect the environment and the health and safety of employees and the public, to maintain the security of the facility and the nuclear substances associated with the facility, and the necessary measures to facilitate Canada's compliance with international safeguards obligations.

1.2 Production Highlights 2017 to 2024

Detailed plant production information is considered "Protected Proprietary" and is submitted to the Canadian Nuclear Safety Commission (CNSC) on an annual basis under a separate cover. The following production summarizes PHCF operating performance between 2017 and 2024:

- The maximum daily production rate for the UF_6 plant did not exceed the licensed limit of 45 tonnes uranium as UF_6. The annual production in the UF_6 plant did not exceed the limit of 12,500 tonnes uranium as UF_6.

- The annual production of uranium as UO_2 did not exceed the licence limit of 2,800 tonnes uranium.

1.3 Forward Outlook for Operations

Cameco's production plans for the PHCF are expected to remain similar and consistent with current output.

1.4 Safety Challenges and Opportunities for Improvement

PHCF is a mature operation with a strong record of safety and environmental performance. The facility's strong performance, excellent training program, along with well-established management programs and procedures, support the strong culture of safety.

2.0 SAFETY AND CONTROL AREAS

2.1 Management System

This safety and control area (SCA) covers the framework that establishes the processes and programs required to ensure that the organization achieves its safety objectives and continuously monitors its performance against these objectives, as well as fostering a healthy safety culture.

Operational Performance

During the current licence period, PHCF replaced its Quality Management Program with the Management Systems Program Manual (MSPM). The MSPM was written to meet the requirements of CSA Standard N286-12 *Management System Requirements for Nuclear Facilities* and Cameco's corporate Management System. The MSPM also meets the requirements of REGDOC 2.1.1 – *Management System*.

Audits and inspections completed during the license period did not identify any significant non-conformances to various criteria. All findings were assessed, and corrective actions developed, as appropriate, to continually improve all aspects of the site's performance.

The PHCF follows a systematic evaluation for its safety culture self-assessments which are completed on a five-year cycle. The most recent self-assessment was completed in 2021 and re-affirmed that the PHCF has a strong commitment to safety and that there is a high degree of trust and confidence in site leadership. This assessment completed the implementation of all aspects of REGDOC – 2.1.2 – Safety Culture at PHCF. The next safety culture assessment is scheduled for 2026.

Consistent with the management system requirements, management review was completed annually during the license period to review suitability, adequacy and effectiveness of policies and programs as well as site performance. Opportunities for improvement were identified and incorporated into site objectives and actions were entered into the Cameco Incident Reporting System (CIRS).

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Management System SCA.

Forward Outlook

Looking ahead to the next licensing period, PHCF will continue to apply improvements to the management system as opportunities are identified.

2.2 Human Performance Management

This SCA covers activities that enable effective human performance through the development and implementation of processes that ensure that licensee staff members are sufficient in numbers in all relevant job areas, and have the necessary knowledge, skills and tools in place, in order to safely carry out the licensed activities.

Operational Performance

During the current licence period, PHCF has maintained a highly trained and competent workforce through its Systematic Approach to Training (SAT) based training program which meets the requirements of REGDOC2.2.2, *Personnel Training, Version 2*.

Summary statistics for the training program during the current licence period are provided in Table 1. Yearly fluctuations are the result of changes to personnel (new hires, job transfers, return to work) or training program requirements (requalification periods, new qualifications).

Table 1 Training Statistics for Current Licence Period

Year	Total Training Hours	Number of Qualifications Granted	% Qualifications Held
2017	14,263	6,939	97.9%
2018	12,387.5	6,389	97.1%
2019	11,390.5	6,888	97%
2020	9,350	6,225	98%
2021	13,350	8,705	97.5%
2022	13,662	8,643	97.8%
2023	15,968.4	8,020	95.7%
2024	18,978.33	9,892	96.6%

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Human Performance Management SCA.

Forward Outlook

In the upcoming licensing period, the development and implementation of HPM tools will continue as CNSC staff develop and publish additional guidance through applicable REGDOCs and Cameco establishes its corporate framework to meet these requirements. Cameco will review and incorporate the applicable aspects of a human performance management program as part of the CNSC regulatory framework improvements.

2.3 Operating Performance

This SCA includes an overall review of the conduct of the licensed activities and the activities that enable effective facility performance.

Operational Performance

During the current licence period, PHCF has operated in a manner that supports safe, clean and reliable production and in compliance with applicable acts and regulations, corporate, divisional and site programs and procedures. Annual operating production targets were achieved for UF_6 and UO_2 operations during the current licence period. Detailed plant production information is considered "protected proprietary" and is submitted to CNSC staff on an annual basis.

Cameco reports unplanned events as required by the NSCA, its regulations and the licence conditions (Table 2). During the current licence period, PHCF reported transportation incidents, radiation protection action level exceedances, injuries reportable under the Canada Labour Code and events requiring Emergency Response Team (ERT) activation. These incidents were investigated in accordance with Cameco's incident reporting and investigation process and corrective actions were identified, tracked, and implemented.

Table 2 Reportable Incidents in the Current Licence Period

Year	Transportation	Action Levels	Environmental Releases	Other	Total
2017	0	4	3	5	12
2018	0	4	2	4	10
2019	0	13	9	5	27
2020	2	5	5	2	14
2021	3	8	4	0	15
2022	1	16	5	1	23
2023	1	8	5	1	15
2024	2	4	3	2	11

*Majority of action level exceedances illustrated in Table 2 were for uranium in sanitary sewer events. PHCF has undertaken significant civil infrastructure improvements and has worked with the CNSC to change the action level for uranium in sanitary from daily to monthly.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Operating Performance SCA.

Forward Outlook

Looking ahead to the next licensing period, Cameco will implement projects to further support improved health, safety and environmental performance.

2.4 Safety Analysis

This SCA covers the maintenance of the safety analysis, which supports the overall safety case for the facility. This safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

Operational Performance

PHCF has a safety analysis report (SAR) that summarizes the systematic review of site operations to identify and assess hazards and potential risks to the public and environment from the facility. A Process Hazard Assessment (PHA) methodology was utilized to systematically determine the potentially hazardous scenarios. The SAR demonstrates that adequate safety systems are in place to prevent an unreasonable risk to persons and the environment and includes an analysis of the probable worst-case release events.

The latest SAR is Version 8 and was submitted in 2022.

Version 7 of the SAR, submitted in 2021, incorporated information from other supporting studies of the facility to better align with the guidance provided in the International Atomic Energy Agency (IAEA) standard SSR-4, *Safety of Nuclear Fuel Cycle Facilities*.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Safety Analysis SCA every year.

Forward Outlook

REGDOC-2.4.4 *Safety Analysis for Class 1B Nuclear Facilities* has been published. PHCF has identified gaps which are being dispositioned.

2.5 Physical Design

This SCA relates to activities that impact on the ability of systems, structures and components (SSCs) to meet and maintain their design basis given new information arising over time and taking into account changes in the external environment.

Operational Performance

Changes to the physical design of equipment, processes and the facility with the potential to impact safety are evaluated through a design control process from initial planning through to completion of the project. This review identifies impacts and potential impacts to the environment, radiation protection, health and safety and fire protection. A site design control procedure is in place, which ensures that any equipment changes or

modifications will not have an adverse effect on the environment, on the health and safety of employees or on members of the public.

In the current licence period, PHCF implemented the CSA standard N393-22, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances,* National Building Code of Canada*,* 2020 edition, National Fire Code of Canada, 2020 edition and implemented the changes in CSA B51-14, *Boiler, pressure vessel, and pressure piping code.*

PHCF has a contractual arrangement with the provincial Technical Standards and Safety Authority to ensure that oversight of pressure retaining components and systems continues to be carried out by a third-party expert.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Physical Design SCA.

Forward Outlook

Looking ahead to the next licensing period, PHCF will implement projects to support N393-22 and CSA B51-14.

2.6 Fitness for Service

This SCA covers activities that impact on the physical condition of systems, structures and components, to ensure that they remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

Operational Performance

PHCF tracks Key Performance Indicators (KPIs) to monitor the effectiveness of the program. Detailed information regarding KPIs is considered protected proprietary and are not made publicly available. Overall, the KPIs reflected strong performance with improvements to the site uptime availability and overall equipment effectiveness, improvements in preventative maintenance schedule compliance and a decrease in the amount of reactive maintenance work.

In-service inspections of piping and vessels in safety significant systems and fire protection system tests were completed as required by site programs and regulatory requirements.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Fitness for Service SCA every year.

Forward Outlook

Looking ahead to the next licensing period, the facility will make improvements to this SCA through the Operational Reliability program and recommendations developed during management review of KPI performance.

2.7 Radiation Protection

This SCA covers the implementation of a radiation protection program, in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses are monitored and controlled.

Operational Performance

PHCF has an extensive Radiation Safety Program in place to meet the requirements of the *Nuclear and Safety Control Act* and the *Radiation Protection Regulations* and ensure exposures are kept to levels as low as reasonably achievable, social and economic factors considered (ALARA). Review of worker dose data between 2017 and 2024 indicates that the program is highly effective in the prevention of unreasonable risk to the health and safety of workers (Cameco employees and contractors). All worker doses were well below the CNSC regulatory limits for effective dose for Nuclear Energy Workers (NEWs) of 50 millisieverts (mSv) per year and no more than 100 mSv over a specified five-year period.

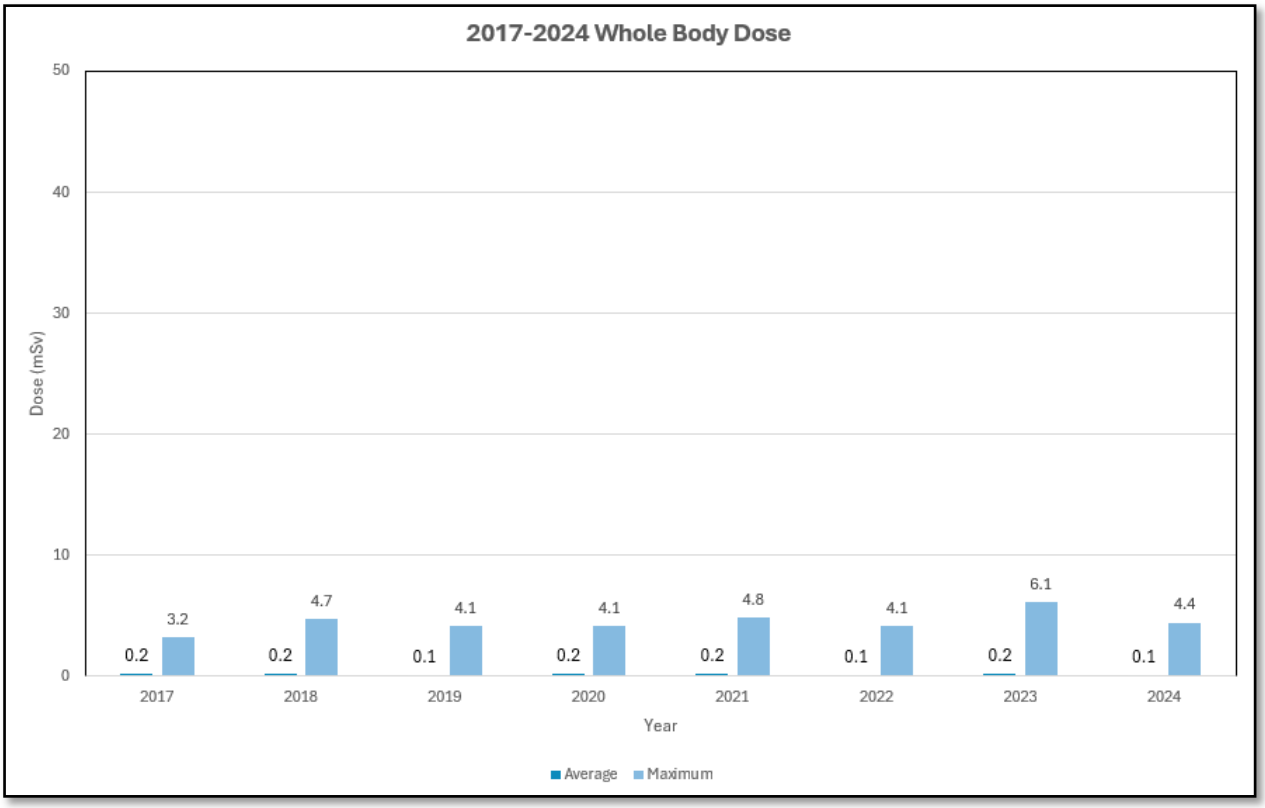
PHCF uses a licensed dosimetry service provider that is accredited by the CNSC for external dosimetry. The dosimetry service provides optically stimulated luminescence dosimeters (OSLD) to PHCF. An OSLD badge is used to monitor whole body, skin, and eye dose. Internal doses are assigned through urine analysis and lung counting programs, which are part of Cameco's licensed internal dosimetry service.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Radiation Protection SCA every year.

Whole Body Dose

The average whole-body doses for NEWs are consistent and extremely low during the period from 2017 to 2024. Figure 1 shows the average annual whole-body dose for NEWs in the period from 2017 – 2024. The maximum whole-body dose in this period was 6.1 mSv in 2023. Managing external exposure dose at these levels ensures that total effective dose for workers remains a small fraction of the CNSC annual limit of 50 mSv.

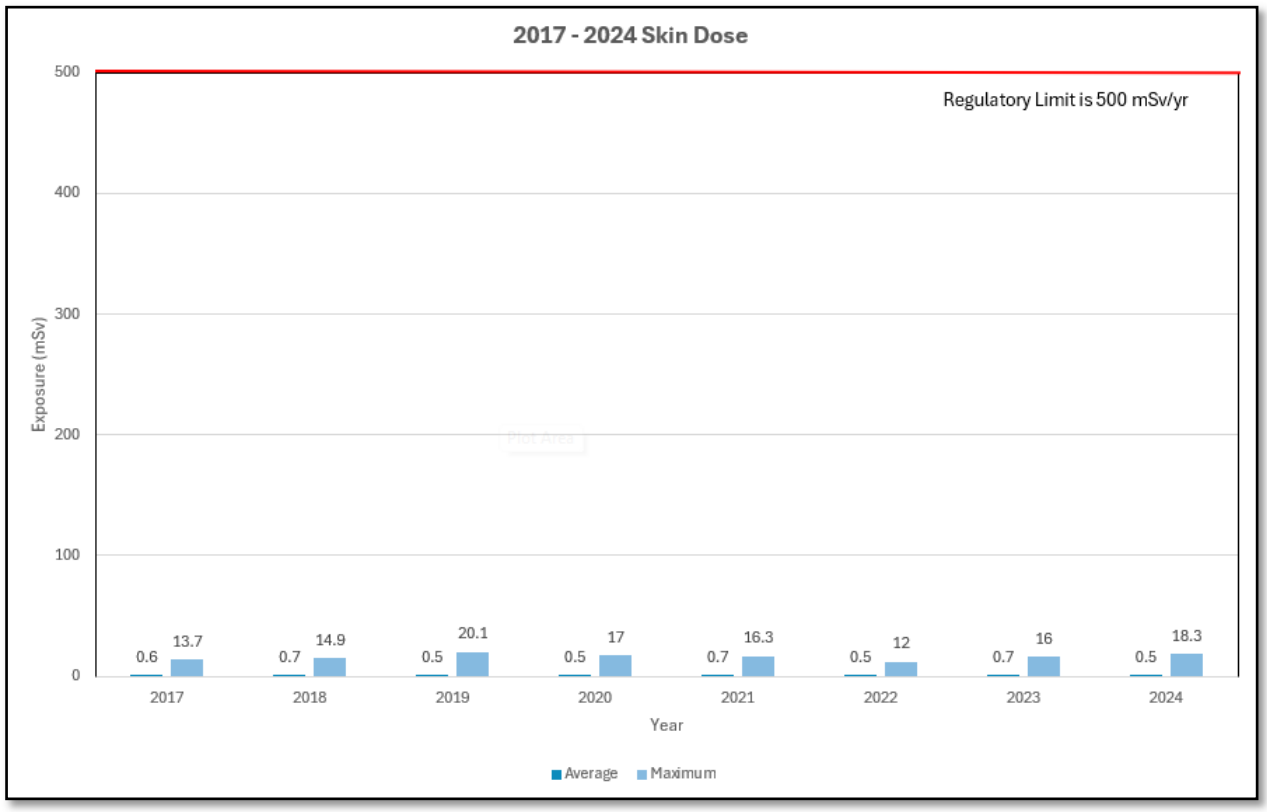
Figure 1 2017-2024 Whole Body Dose



Skin Dose

Dose to skin is measured using dosimeters and compared to the corresponding equivalent dose limit of 500 mSv in the *Radiation Protection Regulations*. Figure 2 shows the average and maximum individual skin dose for NEWs in the period from 2017 - 2024. The maximum individual dose received in this period was 20.1 mSv, which is below 5% of the CNSC annual limit of 500 mSv for skin dose.

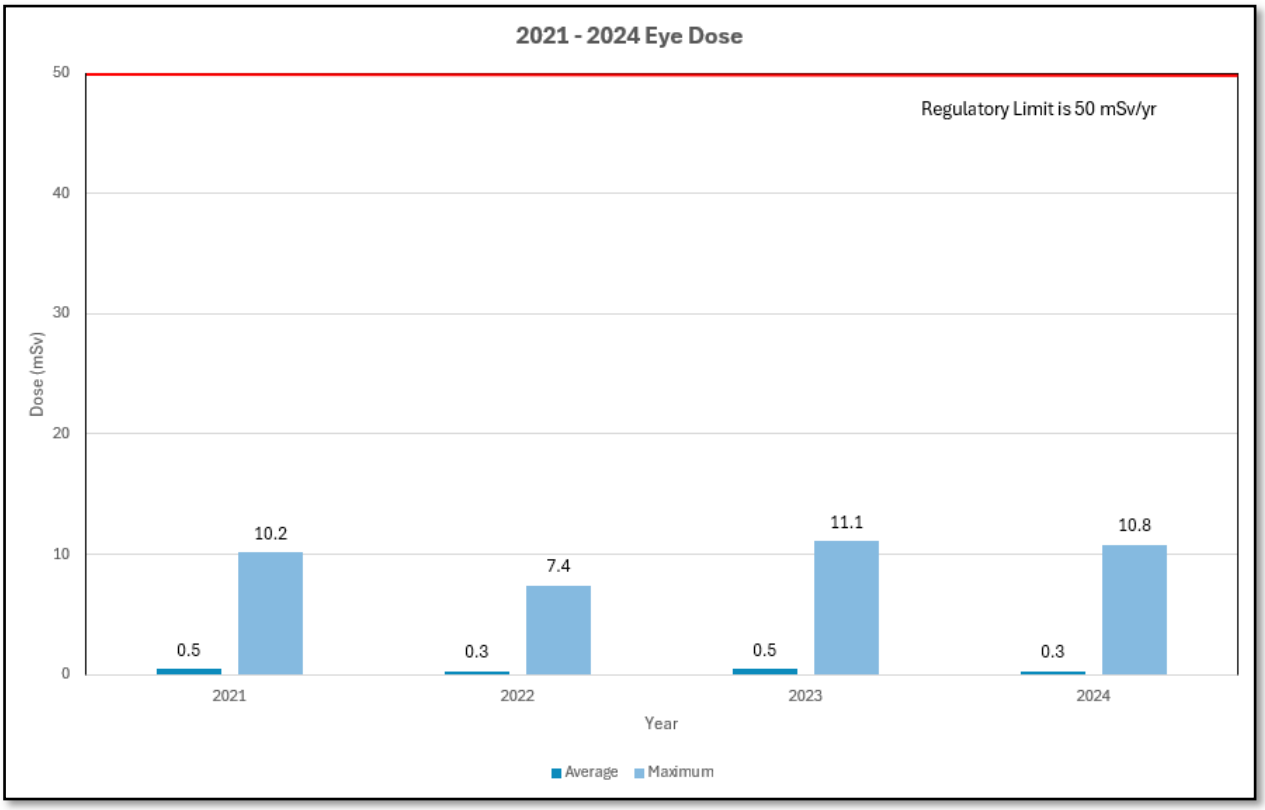
Figure 2 2017-2024 Skin Dose



Eye Dose

Changes to the radiation protection regulations prompted the PHCF to initiate tracking and analysis of eye dose to employees and contractors in 2021. The CNSC regulatory dose limit to the lens of the eye for NEWs is 50 mSv per year. PHCF has an interim monthly and quarterly action level of 6.0 and 12.0 mSv respectively for eye dose. Between 2021 and 2024 the average annual eye dose for NEWS ranged from 0.3 to 0.5 mSv, shown in Figure 3. The maximum eye dose in this period was 11.1 mSv.

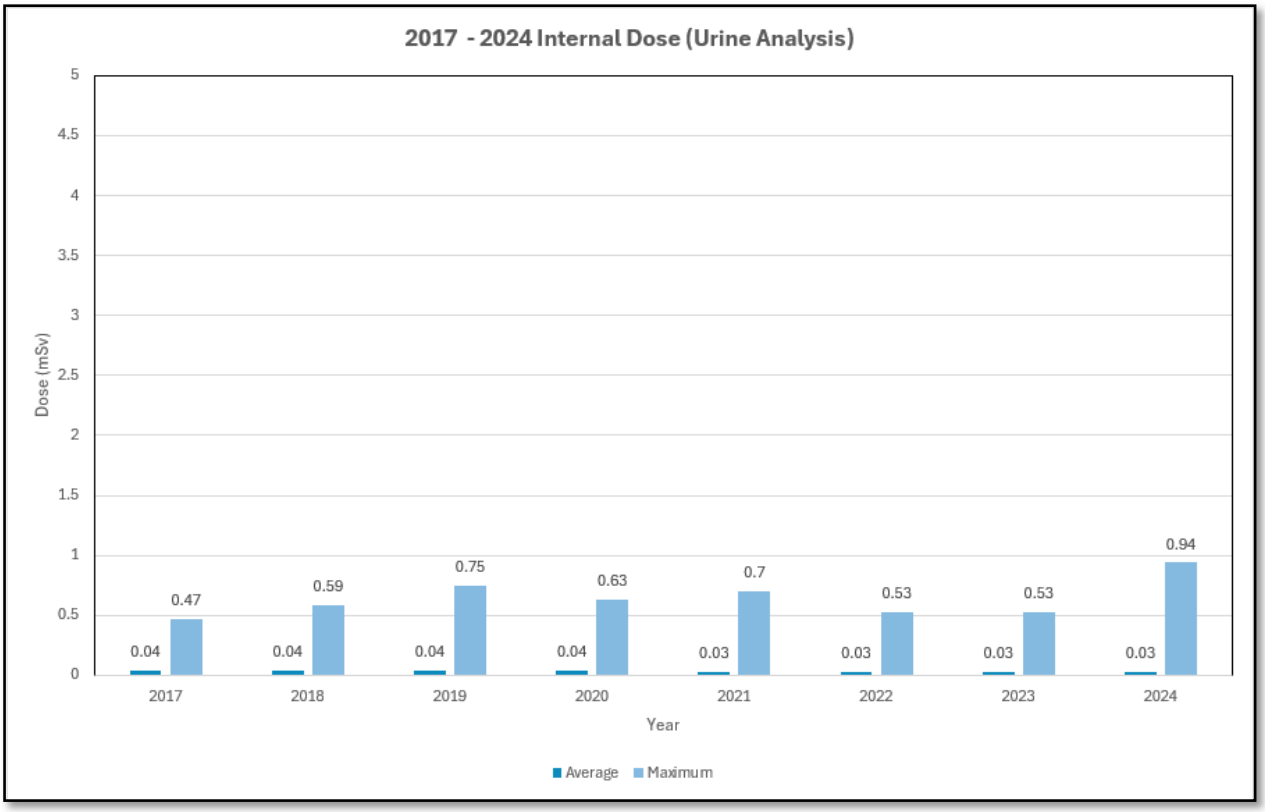
Figure 3 2021-2024 Eye Dose



Urine Analysis

The average internal doses for NEWs from urine analysis are extremely low during the period from 2017 to 2024. Figure 4 shows the average annual internal dose from urine analysis for NEWs ranged from 0.03 mSv to 0.04 mSv, and the maximum dose from urine analysis in this period was 0.94 mSv in 2024. The annual ALARA target for internal urine analysis exposure of 1 mSv was not exceeded from 2017 to 2024. Managing the internal dose component from urine analysis at these levels ensures that total effective dose for workers remains a small fraction of the CNSC annual limit of 50 mSv.

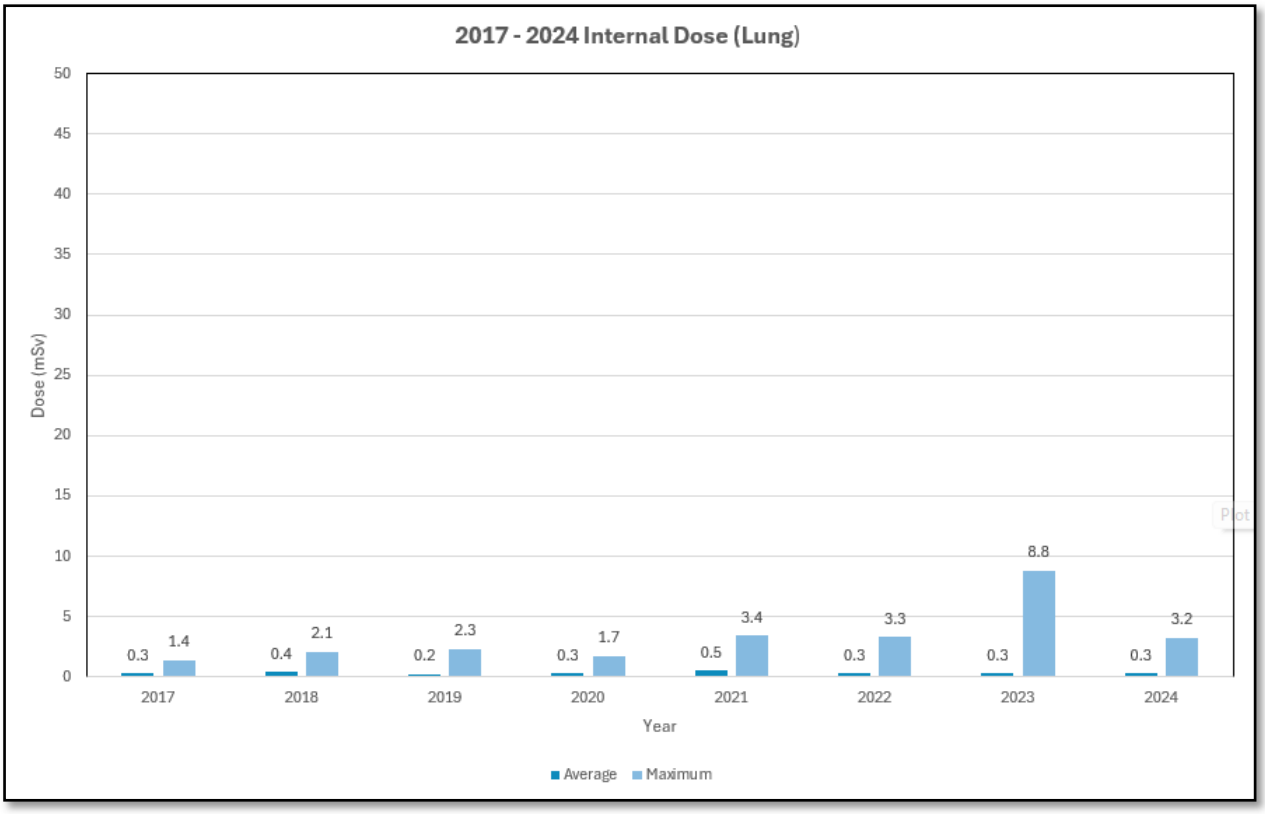
Figure 4 2017-2024 Internal Dose (Urine Analysis)



Lung Counting

As part of the licensed internal dosimetry program, Cameco employs the use of a lung counter to monitor and assess uranium exposure in the lungs of NEWs working at PHCF. Figure 5 shows the average annual internal dose from lung counting for NEWs ranged from 0.2 mSv to 0.5 mSv. The maximum dose from lung counting in this period was 8.8 mSv in 2023. Managing the internal dose component from lung counting at these levels ensures that total effective dose for workers remains a small fraction of the CNSC annual limit of 50 mSv.

Figure 5 2017-2024 Internal Dose (Lung)

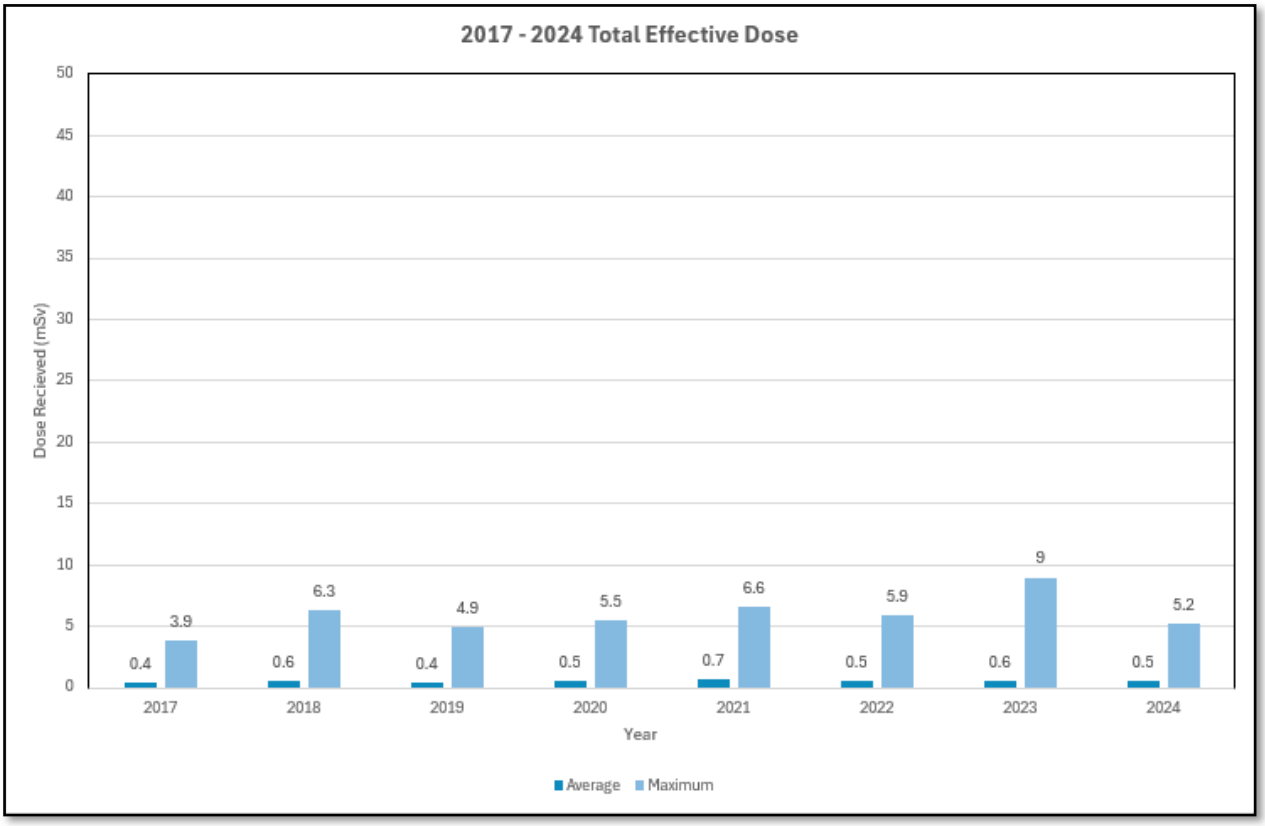


Total Effective Dose (TED)

As per the *Radiation Protection Regulations,* effective dose for NEWs at PHCF is determined through the dose received from outside the body, as measured by optically stimulated luminescence dosimeters (OSLD) as well as the dose received by and committed to the worker from sources inside the body, as measured through lung counting and urine analysis.

Figure 6 presents the total effective dose for workers (employees and contractors) designated as NEWs during the 2017 - 2024 period. The TEDs over the period are extremely low and the regulatory limit of 100 mSv five-year effective dose was not exceeded. The five-year regulatory limit of 100 mSv established in the *Radiation Protection Regulations* applies to unique five-year periods of time. The periods relevant to the current license periods extend from January 1, 2016, to December 31, 2020, and January 1, 2021, to December 31, 2025. For the first five-year period under this licence (January 2016 to December 2020), the maximum TED for a single individual for all five years was 20.6 mSv. For the current period (January 1, 2021, to December 31, 2025) the highest individual result to date is 19.9 mSv (up to December 2024).

Figure 6 2017-2024 Total Effective Dose



Other Radiation Monitoring

The inventory of sealed and unsealed sources that are used or possessed on site was maintained between 2017 and 2024. Regular inspection and leak tests of the sealed sources were carried out and demonstrated that sources are in a state of safe operation and pose no undue risk to workers. Control of sealed sources was maintained throughout the year.

PHCF collects between 25,000 and 31,000 in-plant air samples each year in the current licence period, of those, less than 2.5% were above concentration of uranium in air which requires respiratory protection.

Approximately 50,000 surface contamination monitoring measurements are completed each year. Less than 0.4% of the samples indicated contamination from Zone 3. There were no measurements that indicated contamination in Zone 1.

Between 2017 and 2024, CNSC staff rated PHCF as satisfactory in the Radiation Protection SCA every year.

Forward Outlook

PHCF's RP Program is mature and enables Cameco to keep radiation exposures ALARA. PHCF is compliant with REGDOC-2.7.1 *Radiation Protection* and REGDOC – 2.7.2 *Dosimetry Volume I: Ascertaining Occupational Dose.*

2.8 Conventional Health and Safety

This SCA covers the implementation of a program to manage non-radiological workplace health and safety hazards and to protect personnel and equipment.

Operational Performance

The effectiveness of the conventional OHS system can be evaluated by the responsiveness of the site to leading safety activities such as audits, inspections, evaluations, reviews, benchmarking, training and employee participation and engagement. PHCF has tracked leading and lagging safety indicators for many years. These consist of, but are not limited to, tracking safety meeting attendance, tracking the percentage of safety inspections completed and safety statistics. This data is reviewed by site and divisional management and has helped improve the overall safety performance at the conversion facility. The following table presents the safety statistics for the facility for the current licence period.

Table 3 Health and Safety Statistics

Year/Parameter	2017	2018	2019	2020	2021	2022	2023	2024
First Aid Injuries	60	64	70	41	34	46	49	54
Medical Diagnostic Procedures	1	10	9	3	2	7	18	16
Medical Treatment Injuries	4	12	11	8	2	4	13	5
Lost Time Injuries	1	2	0	0	0	0	0	3
Total Recordable Injury Rate (TRIR)	1.67	4.16	2.46	2.21	0.52	1.32	3.31	2.17

The safety culture survey in 2021 reaffirmed PHCF's strong commitment to safety.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Conventional Health and Safety SCA every year.

Forward Outlook

PHCF will continue to enhance its safety program where opportunities are identified during the upcoming licence period. We continue to strive for zero injuries through all of our operations.

2.9 Environmental Protection

This SCA covers the programs that monitor and control all releases of nuclear and hazardous substances into the environment, as well as their potential effects on the environment, as the result of licensed activities.

Operational Performance

There are both federal and provincial regulatory authorities that have legislative jurisdiction over environmental protection at the facility. The facility's Environmental Protection Program (EPP) monitors the following parameters to ensure protection of people and the environment:

- water and air emissions;
- gamma levels;
- groundwater; and
- soil.

Changes to the Regulatory Framework for Environmental Protection

The facility maintains an EPP that meets the requirements of the ISO14001 standard and Cameco's corporate requirements. During the current licence period, PHCF aligned its EPP with the applicable CSA N288 series standards, which provide guidance on the framework and methodology for establishing a standardized EPP that is protective of people and the environment. This included:

- an Environmental Risk Assessment (ERA) following the requirements of N288.6, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*
- an updated Derived Release Limit (DRL) following the requirements of N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*
- revisions to the EPP to implement CSA N288.5, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills* and CSA N288.6, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*
- development of action levels in accordance with CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities*
- development of a Ground Water Protection Program in accordance with CSA N288.7-15 Ground Water Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills

Dose to the Public

Within the regulatory framework the radiation doses to the public are considered in the environmental protection SCA. The annual regulatory dose limit for a member of the public is 1.0 mSv. The Operating Release Level (ORL) is based on the releases of uranium and external gamma radiation to the environment to ensures the dose to the public from the PHCF is below 0.3 mSv/year with the air and water components each being less than 0.05 mSv/year and gamma component being less than 0.3 mSv/year to ensure the dose to the public remains well below the annual regulatory dose limit for a member of the public of 1.0 mSv.

An ORL equation has been developed to account for all public dose exposure pathways – gamma, air, and water. The annual dose from Site 1 and Site 2 are based on monitoring results for each dose component as shown in Table 4. This table illustrates the individual contributions from air, water, and gamma, as well as the total public dose from each site.

Table 4 Annual Dose – ORL Component Monitoring Results

Annual Dose (mSv/year)								
ORL Component	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Air	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Gamma – Site 1	0.109	0.141	0.078	0.128	0.071	0.087	0.095	0.051
Gamma – Site 2	0.152	0.172	0.125	0.115	0.085	0.116	0.126	0.071
Annual Dose – Site 1	0.110	0.142	0.080	0.129	0.072	0.088	0.097	0.053
Annual Dose – Site 2	0.153	0.173	0.127	0.117	0.086	0.118	0.128	0.072

Gamma Monitoring

To ensure that doses to local residents/critical receptors are ALARA and do not exceed the annual public dose limit of 1 mSv as defined in the *Radiation Protection Regulations*, environmental dosimeters (OSLD) are strategically placed (at chest height) around the exterior perimeter of the licensed facility.

As per the 2016 ORL, dose to the public critical receptor is calculated for both sites 1 and 2 using specific gamma fenceline monitoring locations. The results at stations 2 and 10 are used for Site 1 public dose calculations after July 1, 2019. The results at station 2 and 21 are used for Site 2 public dose calculations.

The annual dose to the critical receptor, for both site 1 and site 2, from 2017 through 2024 is show in Table 5. The dose to the critical receptor used to estimate dose to the public from Cameco's operation is only a small percentage of the public dose limit of 1 mSv/year.

Table 5 Maximum Monthly Public Dose Gamma Monitoring Results

Maximum Monthly Public Dose Gamma Monitoring Results										
Station	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Action level**	**Licence Limit**
2	0.25	0.26	0.20	0.2	0.21	0.23	0.23	0.17	0.40	0.57
13*/10	0.03	0.07*	0.00*/0.05	0.11	0.02	0.01	0.03	0.07	0.10*/0.40	0.40*/0.61
21	0.08	0.07	0.09	0.09	0.03	0.06	0.06	0.05	0.25	0.26

*Denotes values for station number 13

Discharge to Air

The air quality monitoring program at PHCF is divided into source air monitoring and ambient air monitoring. The source air monitoring program collects and analyzes daily

samples from the main stacks on the UF_6 and UO_2 operating plants. Both stacks are continuously sampled for uranium.

Table 6 illustrates PHCF uranium loading to air for the period of 2017 to 2024.

Table 6 Total Uranium Emissions (Air)

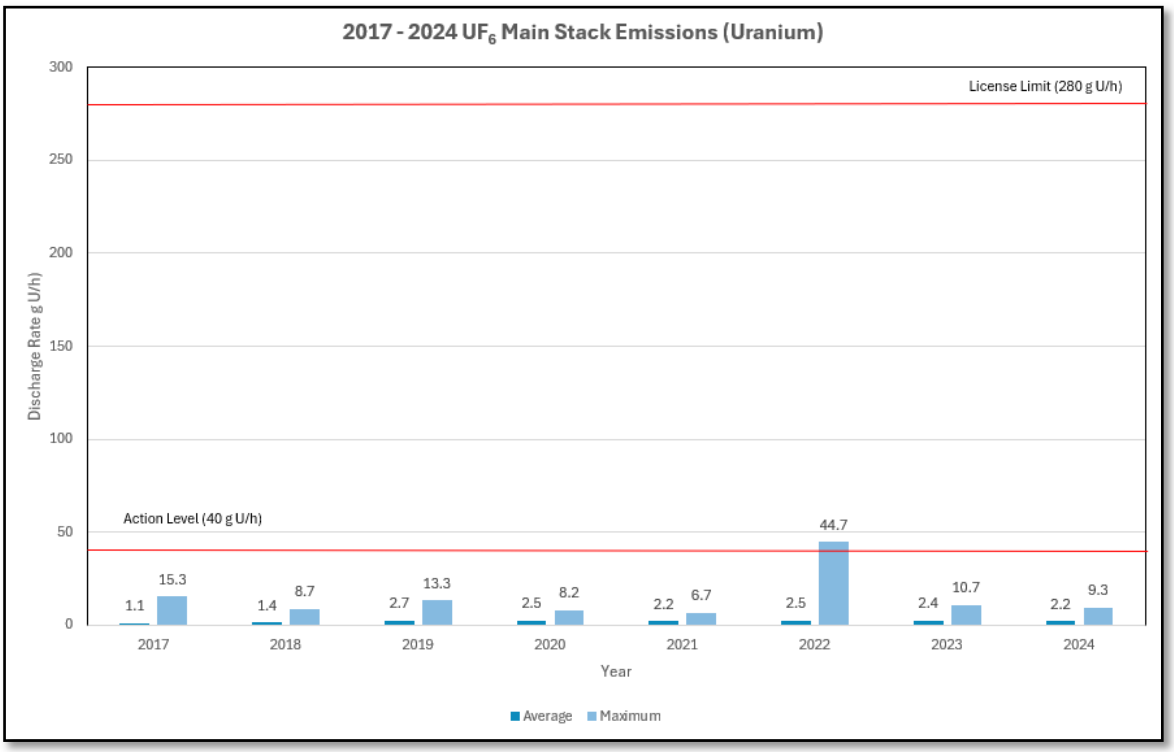
Total Uranium Emissions (kg U)								
Emission	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Air	31.5	34.1	48.5	44.4	39.0	42.7	46.6	45.4

Stack Monitoring Program

The stack monitoring program is used to determine the airborne uranium emission rates on a daily basis from the main stacks of the UF_6 and UO_2 plants. Fluoride emissions are also sampled and analyzed on a continuous basis from the UF_6 plant, as well as ammonia emissions from the UO_2 main stack.

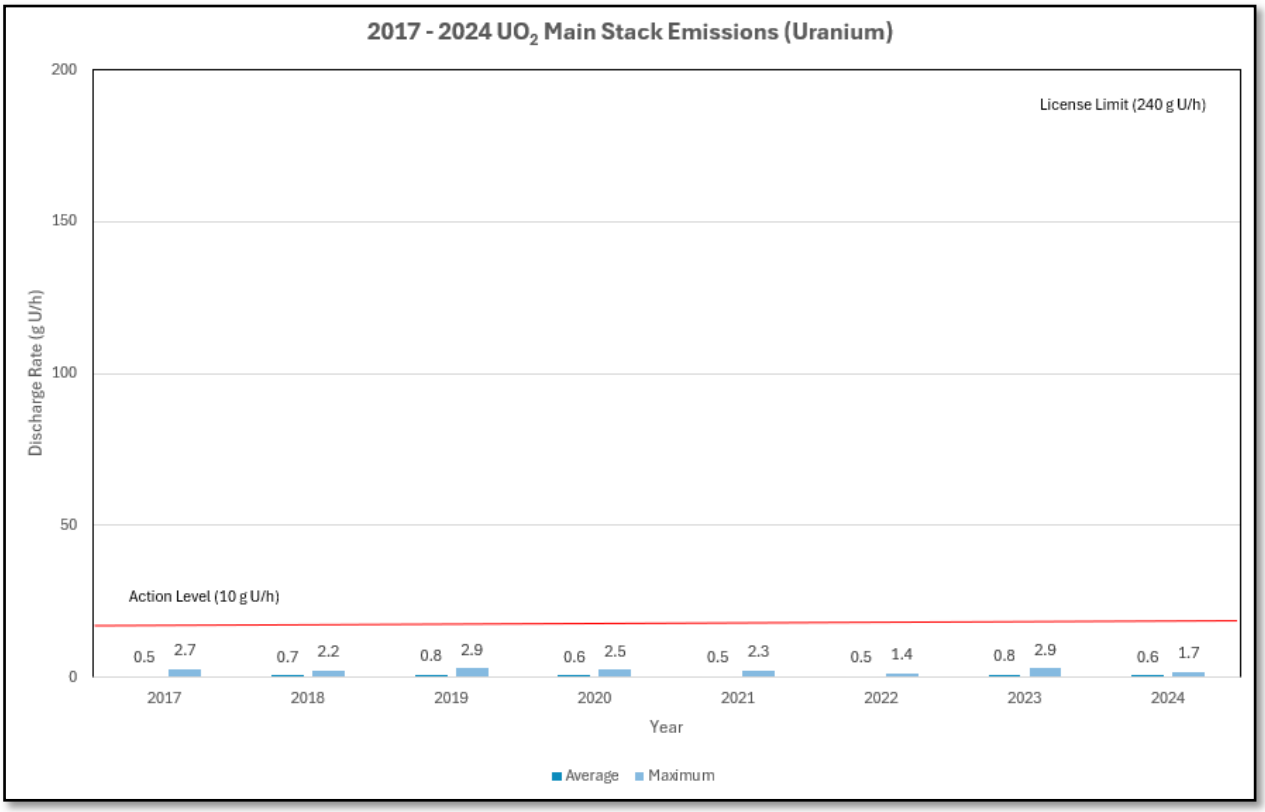
The annual average and maximum uranium emissions have typically remained low for the UF_6 main stack, shown in Figure 8. One action level was exceeded for uranium emissions from the UF_6 plant main stack in 2022.

Figure 8 2017-2024 UF_6 Main Stack Emissions (Uranium)



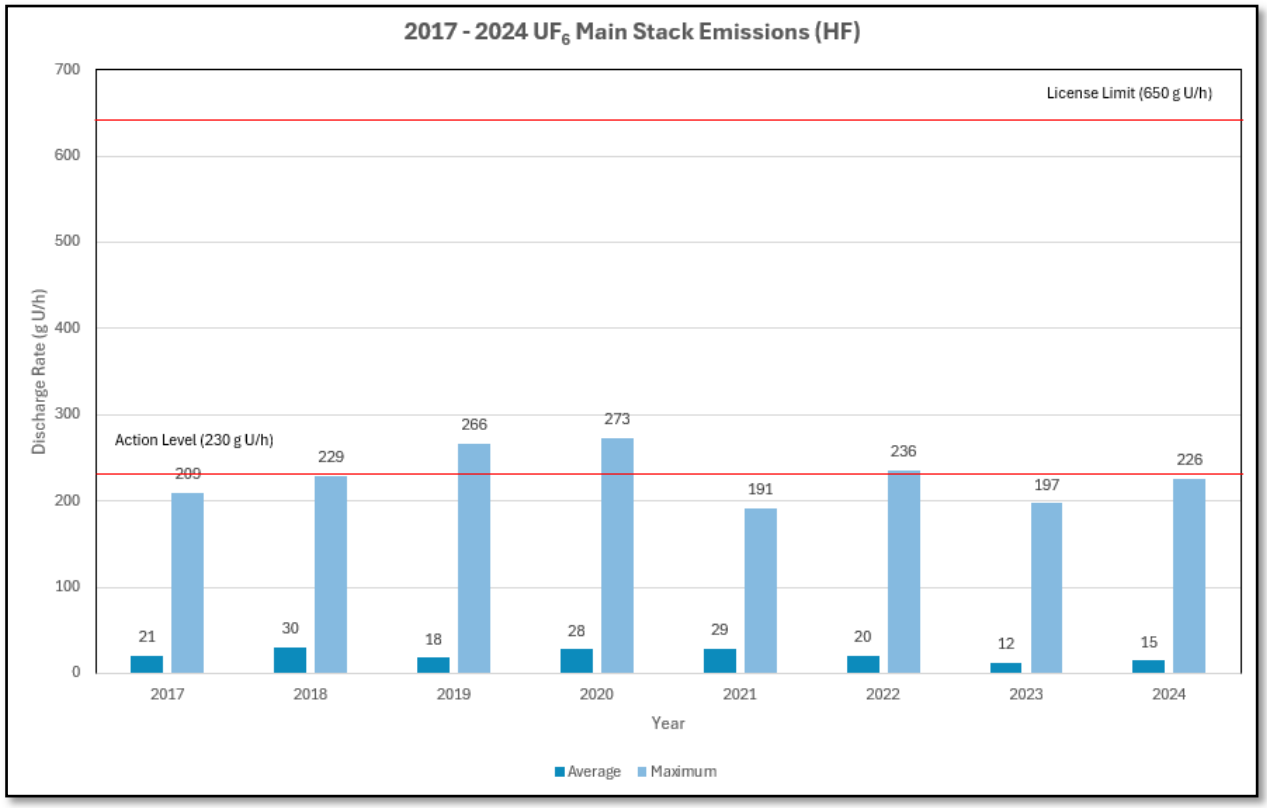
The annual average and maximum uranium emissions have typically remained low from the UO_2 stack shown in Figure 9. No action level exceedances occurred from the UO_2 main stack between 2017 and 2024.

Figure 9 2017-2024 UO_2 Main Stack Emissions (Uranium)



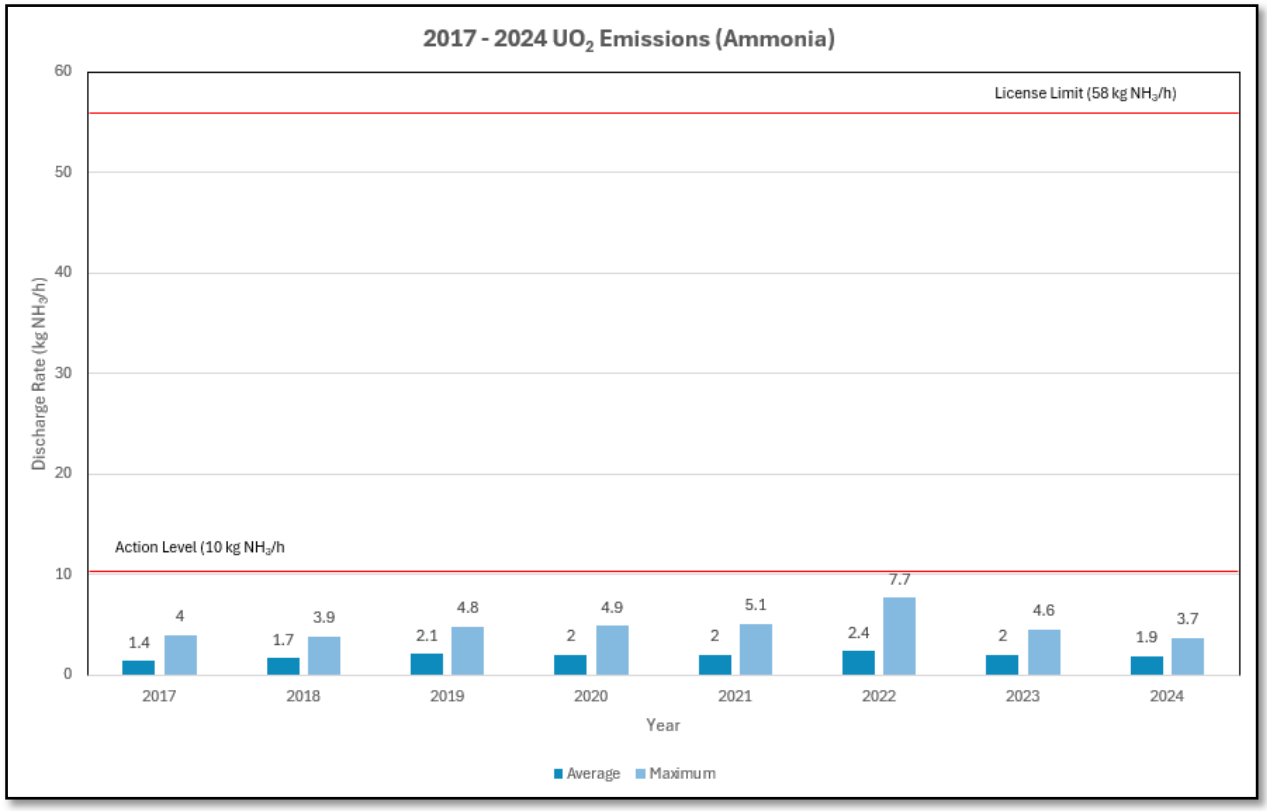
Fluroide emissions from the UF_6 main stack are sampled and analyzed on a continuous basis using an on-line analyzer and the data is collected on the plan computer system. Fluoride emissions from the UF_6 main stack are show in Figure 10. The action level was exceeded for fluoride emissions from the UF_6 plant three times between 2017 and 2024.

Figure 10 2017-2024 UF_6 Main Stack Emissions (HF)



The UO_2 main stack is also continuously sampled for ammonia to determine the ammonia emission rate from the UO_2 plant main stack. Results from 2017 to 2024 are shown in Figure 11. No action level exceedances occurred from the UO_2 main stack between 2017 and 2024.

Figure 11 2017-2024 UO_2 Emissions (Ammonia)



Ambient Air Monitoring

In support of the stack sampling program, an ambient air program has been established to measure air quality near the PHCF. The facility's fluoride and uranium emissions have the greatest potential environmental impacts and therefore are the primary focus of the ambient air program.

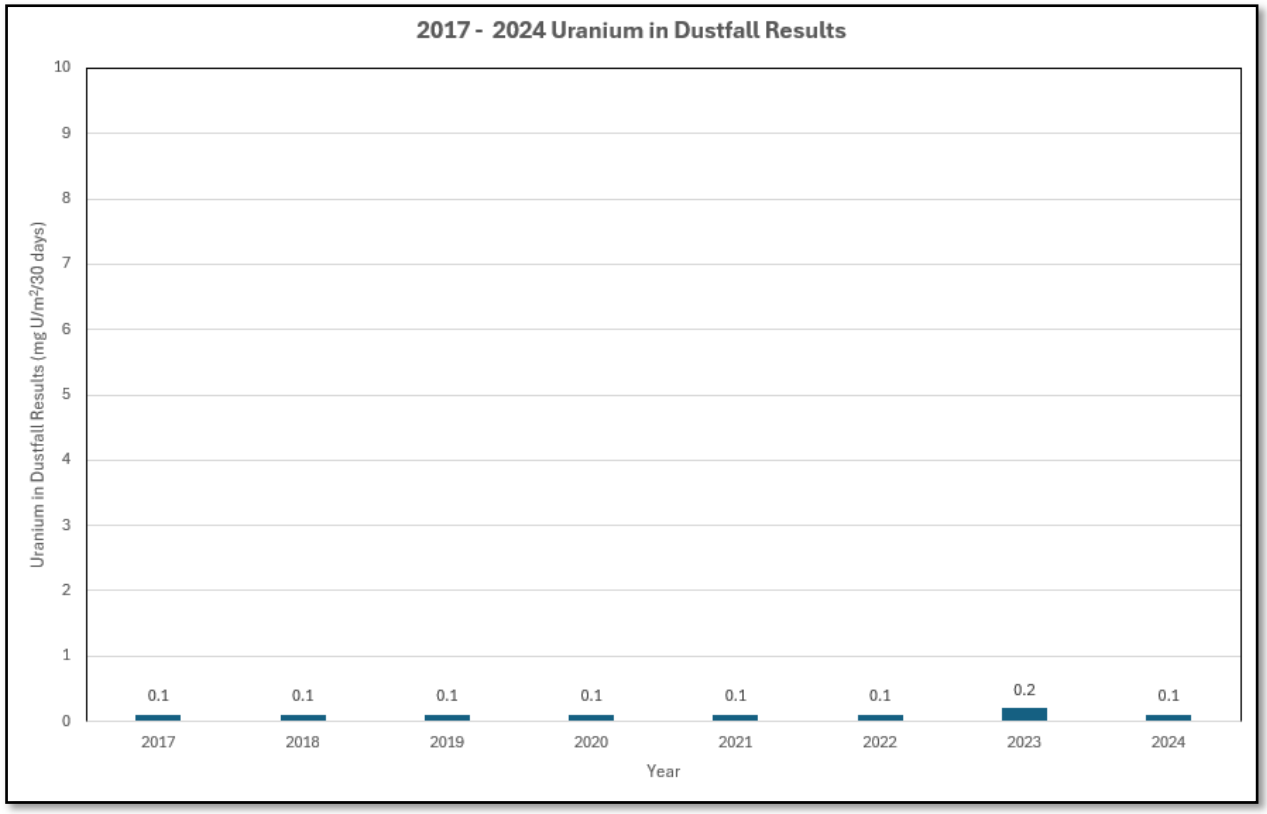
Uranium Emissions

PHCF monitors ambient uranium concentrations in the field using dustfall jars, high volume air samplers and soil samples.

Dust Fall Monitoring (Uranium)

Dust fall monitoring is a measurement of deposition rate and is obtained by collecting particulate matter in a container, termed a dust fall jar. The particulate matter is collected over a one-month period and analyzed to determine the uranium deposition rate. There is no regulated standard for uranium content in dust fall, however, Cameco has established an internal administrative screening level of 10 mg U/m^2/30 days that would be indicative of abnormal conditions. The annual all-station average uranium content in dustfall jars at and near the site in 2017 through 2024 is presented in Figure 12.

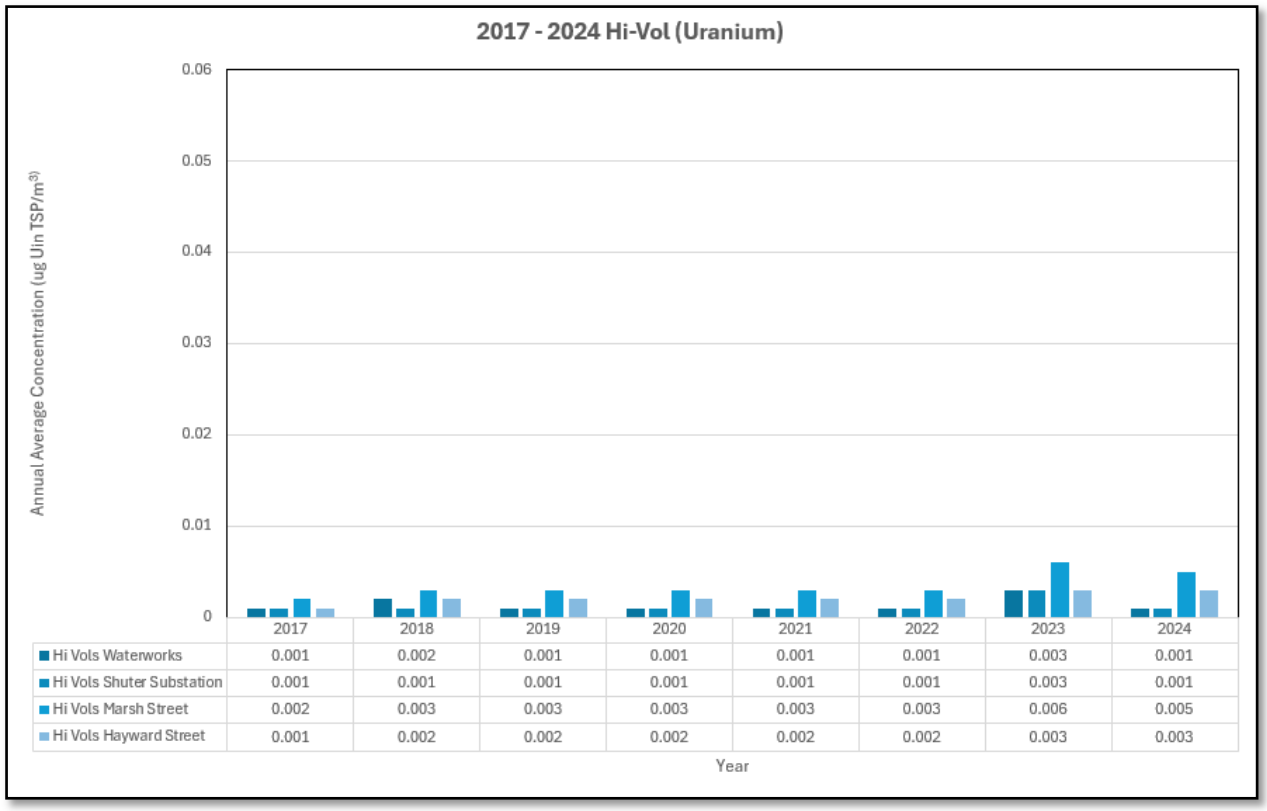
Figure 12 2017-2024 Uranium in Dustfall Results



High-Volume Air Sampling (Uranium)

The high-volume (hi-vol) air-sampling program monitors the concentration of uranium suspended in the air near the facility. There are four monitoring locations located at Marsh Street at the fence line just south of the UF_6 plant, east of the Port Hope Waterworks, Hayward Street, and Shuter Street. Figure 13 shows the average uranium hi-vol results from 2017 through 2024.

Figure 13 2017-2024 Hi-Vol (Uranium)



	2017	2018	2019	2020	2021	2022	2023	2024
Hi Vols Waterworks	0.001	0.002	0.001	0.001	0.001	0.001	0.003	0.001
Hi Vols Shuter Substation	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.001
Hi Vols Marsh Street	0.002	0.003	0.003	0.003	0.003	0.003	0.006	0.005
Hi Vols Hayward Street	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003

Soil Monitoring (Uranium)

The terrestrial sampling program, including soil components, is carried out at frequencies specified in the individual procedures to supplement results from the PHCF air emissions monitoring programs and to monitor the long-term effects of facility air emissions, namely uranium and fluoride, in the areas surrounding PHCF.

The soil sampling approach includes the sampling of 15cm cores, which the contract laboratory separates into composite 0-5cm, 5-10cm, and 10-15cm core segments for uranium analysis. The 2017 through 2022 uranium in soil data is provided in Figure 14 for the clean plot monitoring location. The clean plot, positioned to the west of the municipal water treatment plant, was not sampled in 2023 and 2024 as the background

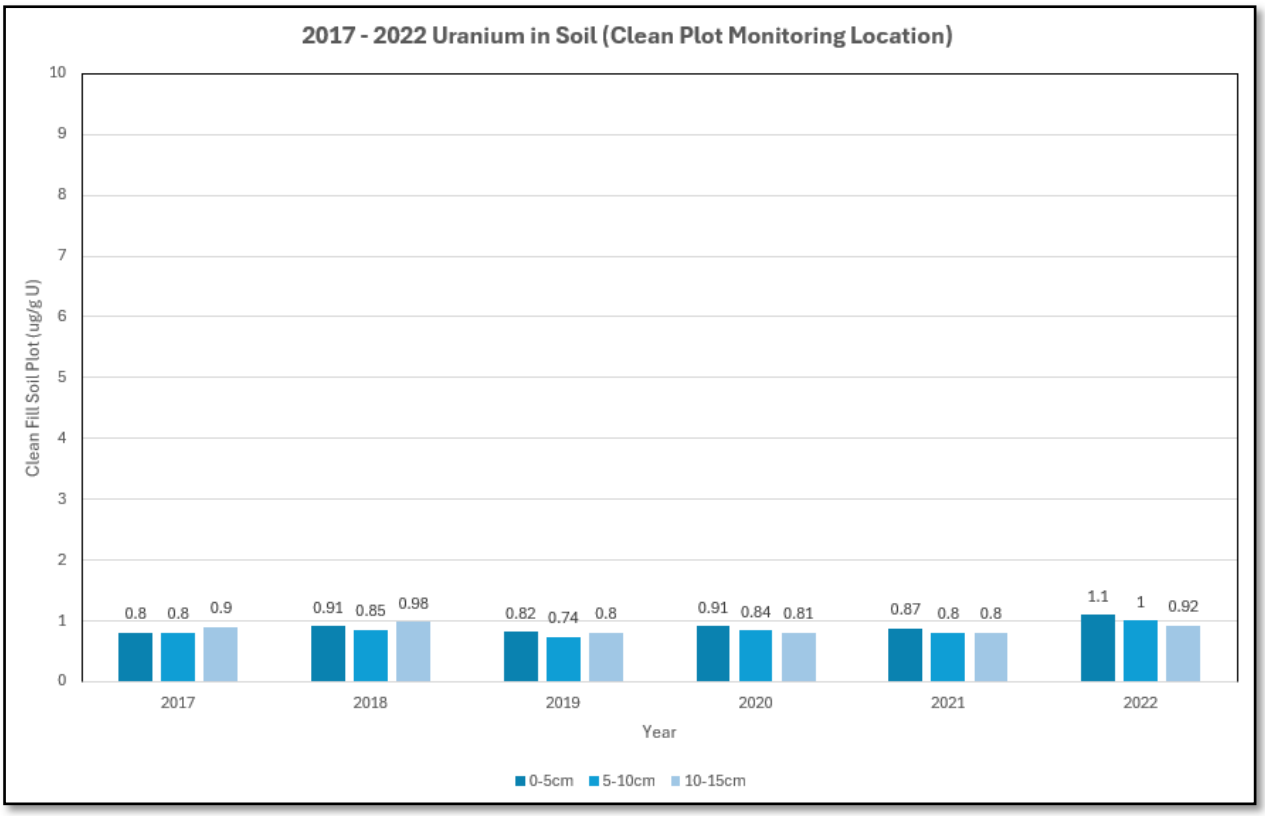
monitoring location was impacted by CNL remediation work. However, individual sampling location uranium in soil monitoring data was completed and submitted in the annual compliance reports.

All individual sampling location values were below the Canadian Council of Ministers of the Environment (CCME) agricultural and residential/parkland land use soil quality guideline of 23 mg/kg (ppm).

Concentrations of uranium in shallow soils as the current monitoring locations are expected to be influenced by historic fill placements within the community. Small scale variability in shallow soils can be observed and the heterogenous nature of fill materials can influence uranium trending at discrete monitoring locations. At both current locations, demolition fill materials have been observed in shallow core samples over time.

Following completion of the Port Hope Area Initiative, Cameco will review and modify the soil monitoring locations as appropriate. The siting of revised monitoring locations with be considered among other items, CNL clean fill placements.

Figure 14 2017-2022 Uranium in Soil (Clean Plot Monitoring Location)



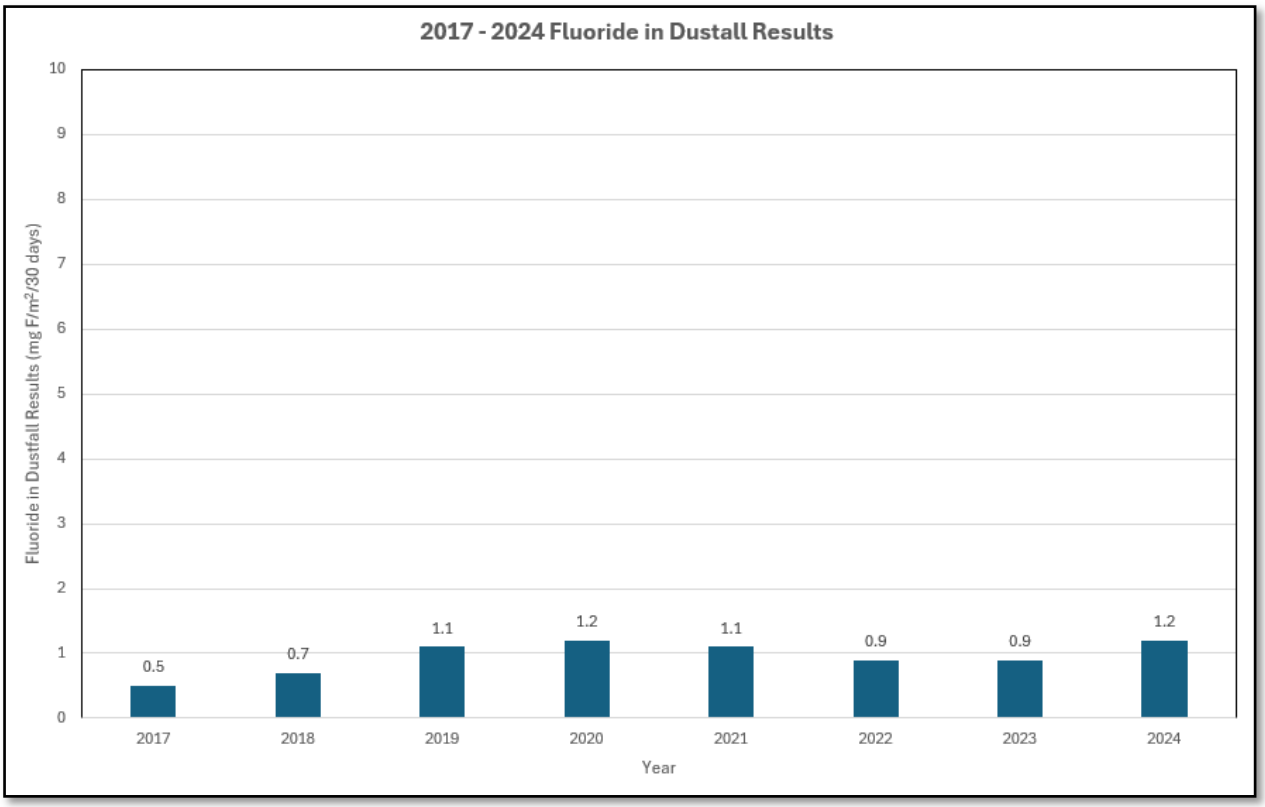
Fluoride Emissions

The concentration of fluoride emissions from Cameco in the ambient environment are monitored in the field using dust fall, lime candle and vegetation sampling.

Dust Fall Monitoring (Fluoride)

In addition to the uranium analysis discussed above, the fluoride content of the collected dust provides information of fluoride in air near the facility. There is no regulated standard for fluoride content in dust fall. However, Cameco has established an internal administrative level of 20 mg F/m^2/30 days that would be indicative of abnormal conditions. The annual all-station average fluoride content in dustfall jars at and near the site in 2017 through 2024 is presented in Figure 15.

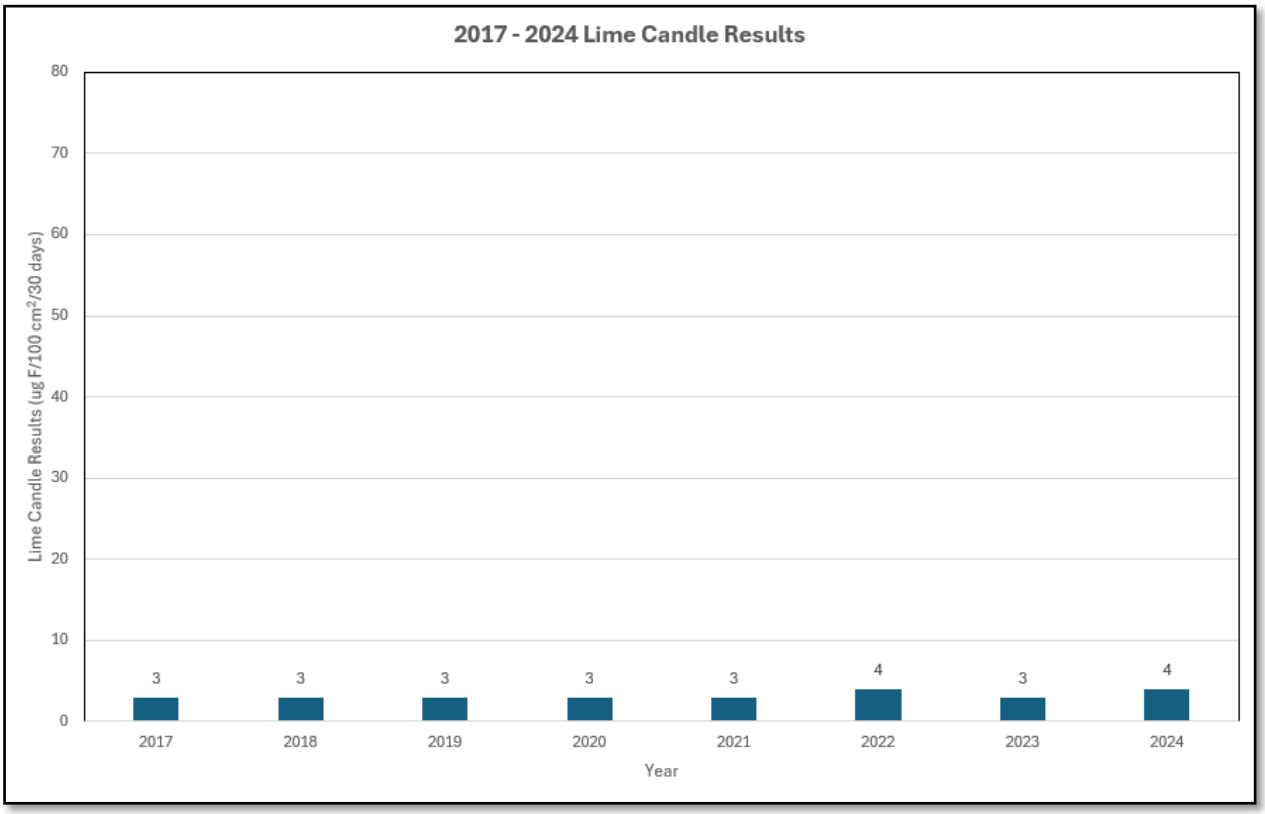
Figure 15 2017-2024 Fluoride in Dustfall Results



Lime Candles (Fluoride)

An established method for measuring the fluoride concentration in ambient air is to expose lime coated filter papers, commonly called lime candles, for a fixed period of time. The lime candles are prepared, deployed, and collected on a specified frequency and are analyzed. The annual average lime candle monitoring results in 2017 through 2024 is presented in Figure 16. The MECP Ambient Air Quality Criteria (AAQC) for fluoridation are 40 ug F/100 cm^2/30 days from April 1 to October 31 and 80 ug F/100cm^2/30 days from November 1 to March 31. These criteria are based on the protection of foraging animals. From 2017 to 2024, there were no lime candle results above the MECP AAQC.

Figure 16 2017-2024 Lime Candle Results

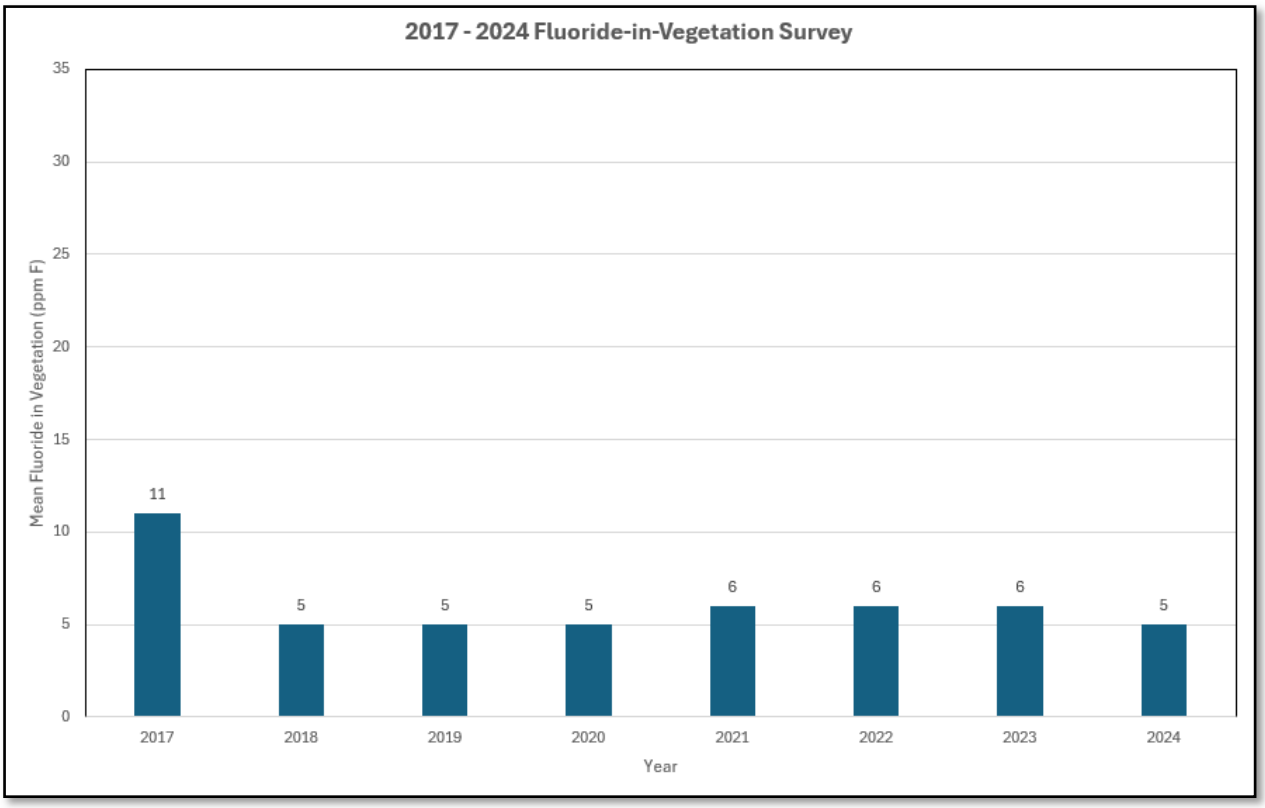


Vegetation Sampling

The focus of vegetation monitoring program is foliar fluoride concentrations within the Municipality of Port Hope. Although the emissions control systems minimize the discharge of fluorides to the environment, the PHCF is an anthropogenic source of fluoride to the local environment.

Figure 17 illustrates the mean vegetation survey results for 2017 through 2024. Note that a given number of individual sample results per calendar year are typically reported less than the contract laboratory detection limit of 5 ug/g, the detection limit skews the plotted annual mean values (skewed high).

Figure 17 2017-2024 Fluoride-in-Vegetation Survey



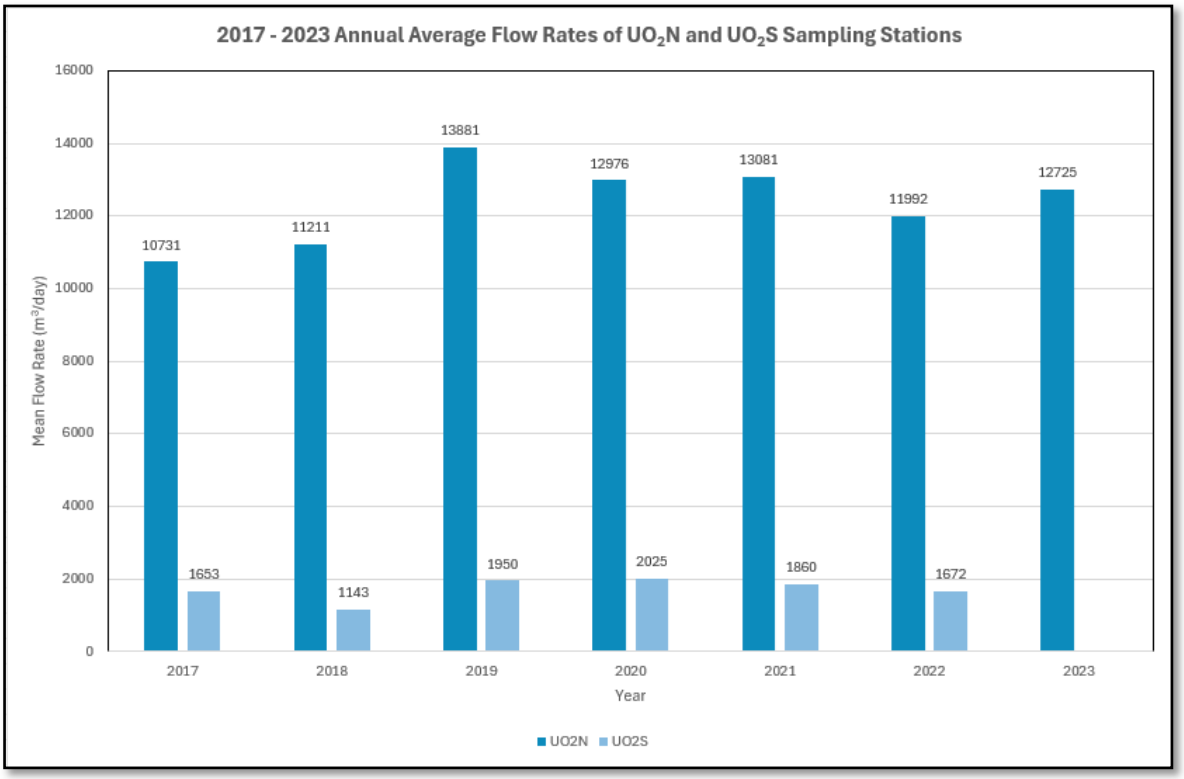
Discharge to Water

This section summarizes the PHCF liquid discharges and associated monitoring programs.

Over the current licencing period, point source discharges from the PHCF operations that were monitored on prescribed intervals included production facility cooling water returns, the combined facility sanitary sewer discharge, the combined cooling water backwash stream, and storm sewer outlets. The transition of production facilities to independent closed loop cooling systems was completed within the 2023 calendar year and as a result, former once-through cooling water works are permanently inactive. The end-of-pipe fish protection screen structure was removed, the associated cooling water pump house intake line was abandoned, and the UF_6 plant cooling water return piping was abandoned within the 2024 calendar year.

Flow was monitored at cooling water discharge points upstream of the harbour in accordance with MECP ECA requirements. Flow rate trending for UO_2N (UF_6 plant + Building 2 Cooling Water Return) for 2017 through 2023 (partial year) and for UO_2S (UO_2 plant cooling water return) are presented in Figure 18. The former UO_2 plant cooling water return was not operational in 2023. The 2023 cooling water works monitoring data for UO_2N is reflective of the January to July operational period.

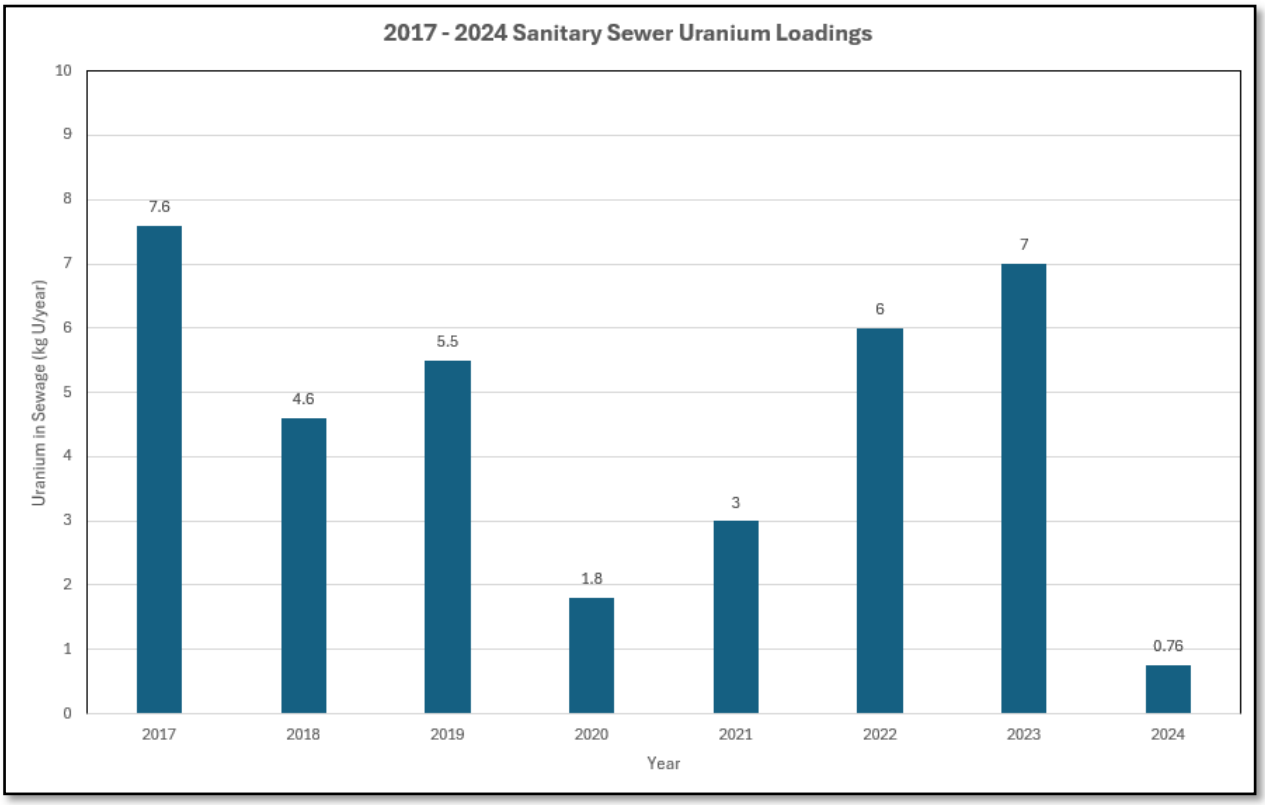
Figure 18 2017-2023 Annual Average Flow Rates of UO_2N and UO_2 S Sampling Stations



Sanitary Sewer Discharge

The combined PHCF sanitary sewer return is sampled on a continuous basis using daily composite sampling. Figure 19 summarizes the annual average uranium loadings to the Municipality of Port Hope's sanitary sewer system between 2017 and 2024.

Figure 19 2017-2024 Sanitary Sewar Uranium Loadings



Harbour Water Supply Monitoring

The ambient water quality program was concerned with monitoring the potential impacts of aqueous discharges into the receiving waters, namely production facility cool water returns. Given its proximity to the harbour outlet, the cooling water intake provided a reasonable indication of the overall water quality in the Port Hope harbour under routine/baseline conditions. Figure 20-23 represent average and maximum values for eah paramater, during the 2017-2023 period. Note that the cooling water intake was in operation for only a portion of the 2023 calendar year, and that CNL harbour remedial work influenced the elevated uranium in the surface water supply over several years.

Figure 20 2017-2023 Harbour Water Quality Average Concentration (Uranium)

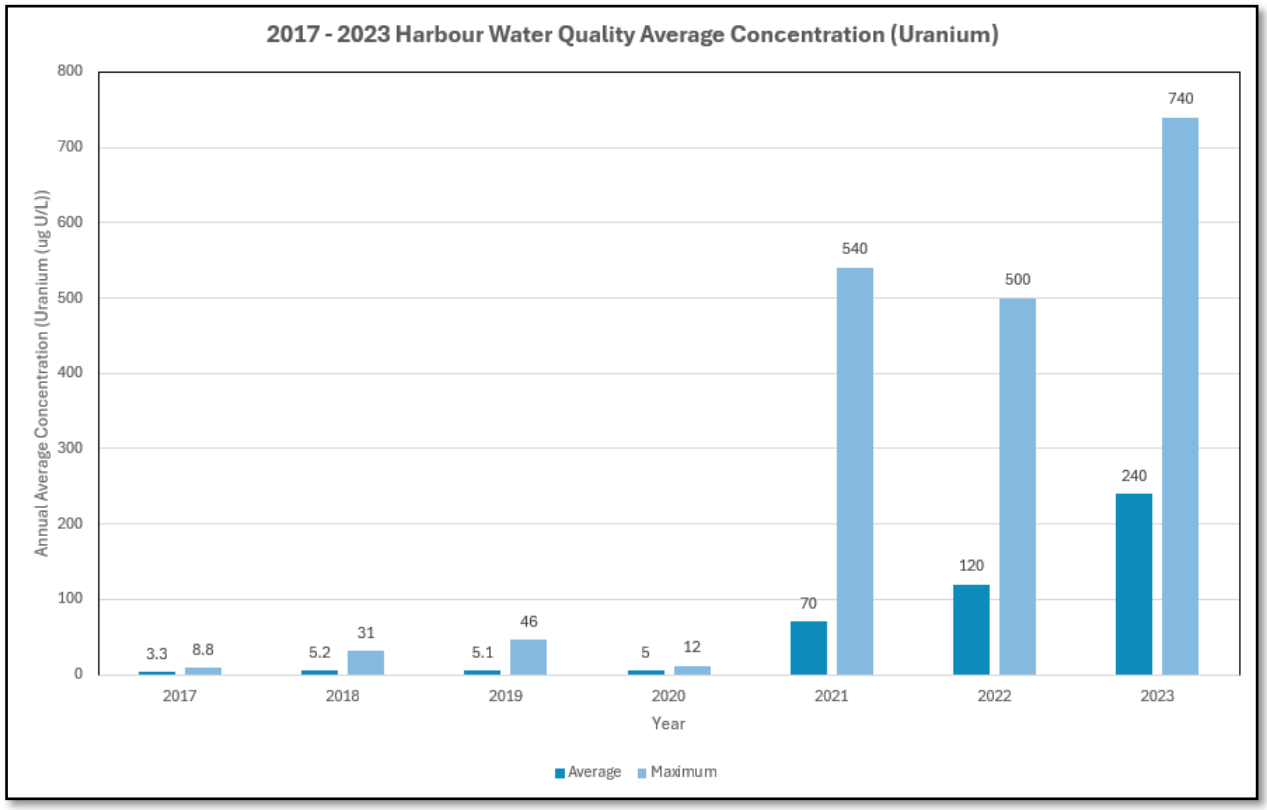


Figure 21 2017-2023 Harbour Water Quality Average Concentration (Fluoride)

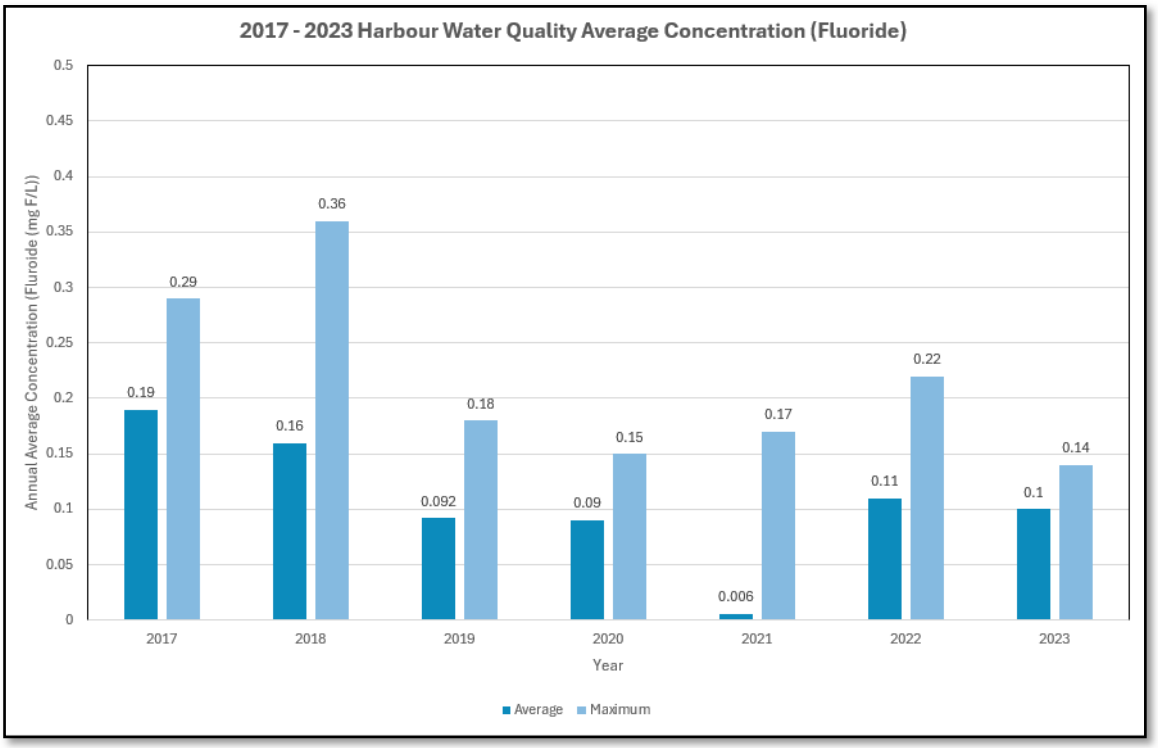


Figure 22 2017-2023 Harbour Water Quality Average Concentration (Nitrate)

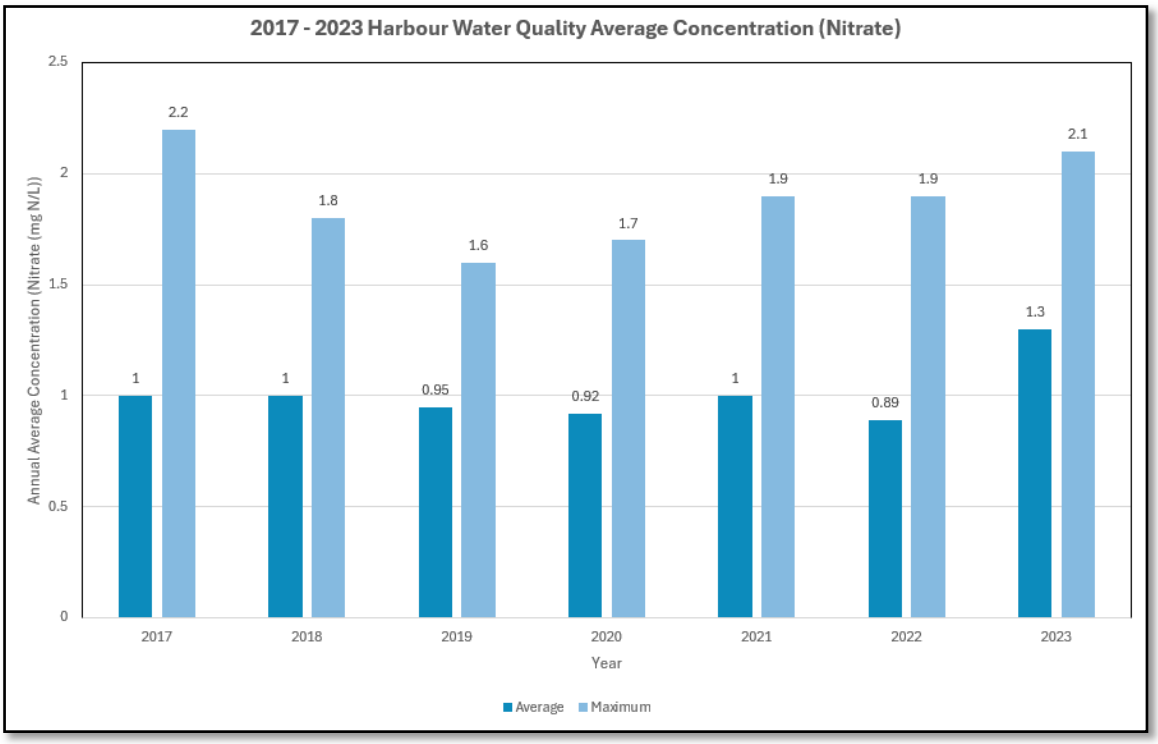
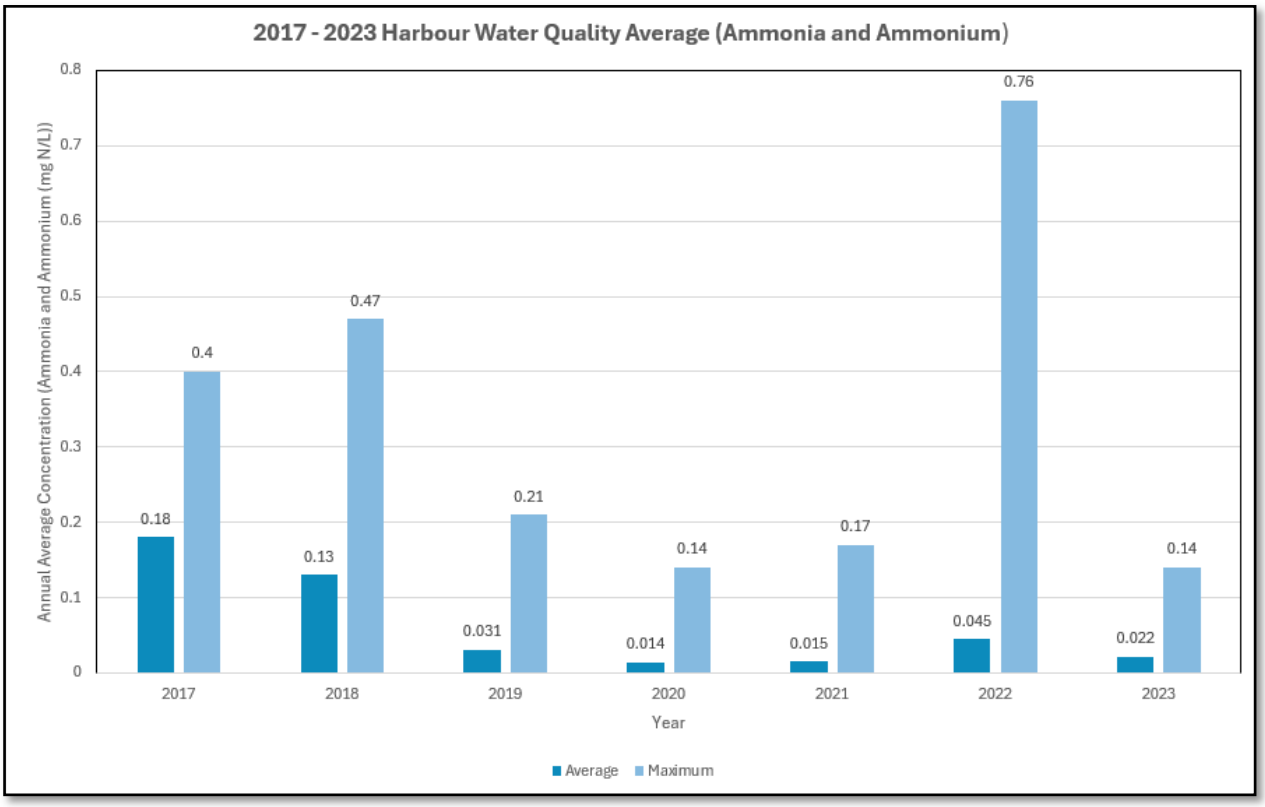


Figure 23 2017-2023 Harbour Water Quality Average (Ammonia and Ammonium)



Storm Water Monitoring

The storm water monitoring program is carried out twice per calendar year. Precipitation events targeted for sampling, where available and practical, are 10+ mm forecasts proceeded by 48 hours of dry weather.

Grab samples are obtained from up to six storm sewer outlets immediately upstream of the harbour at catch basin/maintenance hole access points, where available. Outlets 2, 6, 8, 11, 13, and 15 are the focus of the current monitoring program. Table 7 provides a summary of stormwater uranium results from 2017 – 2024. Note that outlet 8 is typically dry during sampling events due to its catchment area comprising of granular cover, which means some years, no samples were obtained.

Table 7 Storm Water Monitoring Results

2017-2024 Storm Water Monitoring Results										
Location	**Parameter**	**Value**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Outlet 2	Uranium (mg/L)	Min	0.531	0.236	0.181	0.143	0.0456	0.0902	0.217	0.338
		Max	1.52	0.89	0.239	0.313	0.515	0.153	0.561	0.362
Outlet 6		Min	0.0393	0.0586	0.0309	0.0450	0.0547	0.0276	0.153	0.126
		Max	0.134	0.123	0.105	0.111	0.177	0.0389	0.198	0.132
Outlet 8		Min	n/a	n/a	n/a	n/a	0.0483	n/a	0.549	0.297
		Max	n/a	n/a	n/a	n/a	0.0483	n/a	0.549	0.297
Outlet 11		Min	0.0931	0.155	0.0897	0.0690	0.105	0.0430	0.388	0.0988
		Max	0.0931	0.206	0.305	0.192	0.345	0.0400	0.429	0.161
Outlet 13		Min	0.0785	0.0692	0.0678	0.0467	0.0656	0.0255	0.175	0.0626
		Max	0.835	0.154	0.553	0.125	0.270	0.0468	0.217	0.0910
Outlet 15		Min	0.0434	0.0515	0.185	0.0302	0.0216	0.0061	0.0505	0.0279
		Max	0.124	0.0963	0.257	0.0897	0.0777	0.0167	0.102	0.0812

Ground Water Monitoring

The PHCF long-term groundwater monitoring program includes groundwater level monitoring and groundwater sampling at select wells. Groundwater is sampled under the following schedules: monthly sampling of the operating recovery wells; quarterly sampling of select monitoring wells' annual sampling of select bedrock monitoring wells; and biennial sampling of select harbour area monitoring wells. Areas of focus include the UF_6 plant area (east and south); the waste recovery building/warehouse areas; the former UF_6 plant area; and the UO_2 area.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Environmental Protection SCA every year.

Forward Outlook

There is an established process for review of new standards and REGDOCs and their incorporation as Compliance Verification Criteria (CVC) or guidance in the LCH. As per the process, PHCF will identify and address any gaps in the facility safety analysis on a schedule accepted by CNSC staff. It is expected that PHCF will continue to maintain and

enhance if necessary, its Environmental Protection Program during the next licence period.

2.10 Emergency Management and Response

This SCA covers emergency plans and emergency preparedness programs. These procedures must exist for emergencies and for non-routine conditions. This also includes the fire protection program and any results of emergency exercise participation.

Operational Performance

Emergency preparedness and response training is provided on an ongoing basis to ensure that responders have the knowledge and skills necessary to provide for an effective emergency response. The facility maintains personnel onsite to allow for an entry team, and a rapid intervention team to respond to incidents at the facility 24-hours a day when the facility is operating.

PHCF conducts a minimum number of drills and training exercises each year to test the Emergency Response Plan and to provide the members of the various Emergency Response Organizations to improve and sustain their emergency response capability. These include tabletop exercises, drills, and full simulations.

During the current licence period, REGDOC 2.10.1: *Nuclear Emergency Preparedness and Response* and CSA N393-22: *Fire Protection for facilities that process, handle, or store nuclear substances,* National Building Code of Canada, 2020 edition, and National Fire Code of Canada, 2020 edition were published and incorporated into the licence requirements. PHCF updated the Emergency Response Plan, Fire Protection Program and Fire Hazard Analysis to include new requirements from these documents to enhance its already strong emergency response capabilities.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in the Emergency Management and Fire Protection SCA every year.

Forward Outlook

It is expected that PHCF will continue to maintain and enhance, if necessary, its Emergency Management and Fire Protection programs during the next licence period.

2.11 Waste Management

This safety and control area covers internal waste and by-product-related programs which form part of the facility's operations, up to the point where the waste is removed from the facility to a separate waste and by-product management facility. This SCA also covers the ongoing decontamination projects and planning for decommissioning activities.

Operational Performance

PHCF has a focus on reducing the inventory of accumulated radioactive waste and disposing of all eligible materials at the LTWMF.

Ongoing waste is generated at the facility as a result of activities authorized by the licence. Solid wastes contaminated by uranium are reprocessed, recycled and re-used to the extent possible. Waste materials that cannot be reprocessed, recycled or re-used are safely stored on site until appropriate disposal options are available.

In the current licence period, PHCF reduced the inventory of drummed waste by 75% through several projects. The VIM project generated a significant amount of waste in the form of soil and building rubble. These wastes were shipped to the LTWMF.

The PHCF routinely shipped a secondary products (fluoride product) to licensed facilities for uranium recovery. In the current licence period, PHCF incorporated the requirements of CSA standard N292.3-14 *Management of Low- and Intermediate-Level Radioactive Waste*, CSA standard N292.0-14 *General Principles for the Management of Radioactive Waste and Irradiated Fuel and REGDOC 2.11.1 Waste Management, Volume I: Management of Radioactive Waste* into its waste management program.

Decommissioning Planning

The PHCF has a Preliminary Decommissioning Plan (PDP), which meets the requirements provided in CSA N294.0-09 *Decommissioning of facilities containing nuclear substances,* REGDOC-2.11.2 *Decommissioning,* and REGDOC-3.3.1 *Financial Guarantee for Decommissioning of Nuclear Facilities and Termination of License Activities.*

The PDP was updated in September 2022, and the financial guarantee was approved by the commission in May 2024.

Between 2017 and 2024, CNSC staff have rated PHCF as satisfactory in Waste Management SCA every year.

Forward Outlook

PHCF will continue to maintain and enhance waste management programs and update decommissioning plans as required during the upcoming licence period. In the next licencising period Cameco will continue to remediate PHCF through the VIM project. It’s anticipated the VIM project will conclude within the next five years.

2.12 Nuclear Security

This SCA covers the programs required to implement and support the security requirements stipulated in the regulations, in *Nuclear Safety and Control Regulations*, the *Nuclear Security Regulations* and other CNSC requirements.

Operational Performance

PHCF maintains a comprehensive Facility Security Plan (Security Plan) which meets the requirements of the *General Nuclear Safety and Control Regulations*, the *Nuclear Security Regulations* and other CNSC requirements.

The Security Plan provides the basis for security operations at the facility and identifies the systems and processes in place to meet security program objectives; accordingly, this document is considered prescribed information and is subject to the requirements of the *General Nuclear Safety and Control Regulations*. PHCF ensures that security operations and procedures are reviewed (and revised as needed) in order to maintain compliance with *General Nuclear Safety and Control Regulations*, the *Nuclear Security Regulations* and other CNSC requirements.

Between 2017 and 2024, CNSC Staff have rated PHCF as satisfactory in the Security SCA every year.

Forward Outlook

PHCF will continue to maintain and enhance, if necessary, its Security Plan during the upcoming licence period.

2.13 Safeguards and Non-Proliferation

This safety and control area covers the programs 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 Non-Proliferation of Nuclear Weapons*.

Operational Performance

During the current licence period, Cameco implemented a new accountability system to align with electronic reporting requirements described in REGDOC-2.13.1 *Safeguards and Nuclear Material Accounting*. FSD Safeguards Program (FSD-PGR-SG-01) was developed to demonstrate how Cameco meets all requirements under the REGDOC. Periodic audits of the safeguards program are conducted by the IAEA, the CNSC and by Cameco internal auditors. During the current licence period a total of 37 Short Notice Random Inspections, eight Physical Inventory Verifications and three Physical Inventory

Taking Evaluations were carried out by the IAEA and CNSC as part of safeguards activities.

Between 2017 and 2024, CNSC Staff have rated PHCF as satisfactory in the Safeguards and Non-Proliferation SCA every year.

Forward Outlook

PHCF will continue to maintain and enhance, if necessary, its Safeguards Program during the upcoming licence period.

2.14 Packaging and Transport

This safety and control area covers the packaging and transport of nuclear substances and other nuclear materials to and from the licensed facility.

Operational Performance

Uranium trioxide (UO_3) is produced, packaged in purpose-built totes and transported by road to PHCF. UO_3 is also packaged in drums and transported by road and marine to other customers worldwide. These containers meet the Type IP-1 packaging requirements as specified in the CNSC *Packaging and Transport of Nuclear Substance Regulations, 2015*.

PHCF receives Uranium Trioxide (UO_3) by road from Cameco's Blind River Refinery (BRR). Recoverable uranium material, wastes and other uranium bearing materials that cannot be processed at the conversion facility are transported by road or rail to appropriately permitted facilities in Canada and the United States.

Between 2017 and 2024, nine minor transportation events were reported by PHCF.

Between 2017 and 2024, CNSC Staff have rated PHCF as satisfactory in the Packaging and Transport SCA every year.

Forward Outlook

Cameco will continue to comply with the existing and new regulatory requirements in this SCA in the next licensing period.

3.0 ADDITIONAL INFORMATION

3.1.1 Public Information Program

FSD maintains a Public Information and Disclosure Program (PIDP) that meets the requirements of REGDOC 3.2.1, *Public Information and Disclosure*. Cameco works to

build and maintain the trust of local communities by acting as a good corporate citizen in the communities where we operate. A key element of this work is a commitment to provide the community with accurate, timely and transparent reporting of our environmental practices and performance. These are central values for Cameco, and it is these values that drive the public information and disclosure program.

For many years Cameco has retained outside expertise to measure public opinion in Port Hope to estimate support for Cameco's Port Hope operations and to gather perspectives regarding local operations. The most recent survey of more than 300 residents of Port Hope was completed by Praxis Consulting in 2024. The final report is available on Cameco's community website.

The survey results demonstrate Port Hope residents' consistent support for Cameco's local operations, citing the company's economic impacts, positive corporate citizenship, and support for clean, nuclear energy, as the top drivers. 91% of respondents support the continuation of Cameco's operations locally, and 82% expressed pride in having Cameco as part of the Port Hope community, with other significant findings including:

- 84% agree Cameco has the environmental monitoring in place to protect the health of the
  Port Hope community.
- 93% of respondents describe themselves as knowledgeable about Cameco's operations.
- 95% of respondents are aware that Cameco invests in the Port Hope area through sponsorships and other community initiatives

The results of this public opinion research confirm that Cameco's public information program is seen as effective and appropriate by the vast majority of Port Hope residents. Cameco will continue to explore opportunities to enhance the public information program for target audiences.

3.1.2 Indigenous Engagement

Cameco is committed to provide opportunities to engage with First Nation and Métis communities regarding PHCF's ongoing operations.

Cameco has built meaningful and respectful relationships with Indigenous communities, grounded in trust, transparency and learning. While our relationships with Curve Lake First Nation and Scugog Island First Nation have been formalized, we remain equally committed to engaging with and sharing information with other Indigenous communities. The FSD PIDP includes details of specific Indigenous outreach activities to be completed by Cameco.

Cameco will continue outreach to the local First Nations and Métis communities throughout the licensing process and subsequent licence period.

3.1.3 Financial Guarantee

PHCF has a Preliminary Decommissioning Plan (PDP), which was prepared based on guidance provided in CSA N294.0-09 *Decommissioning of facilities containing nuclear substances,* REGDOC-2.11.2 *Decommissioning,* and REGDOC-3.3.1 *Financial Guarantee for Decommissioning of Nuclear Facilities and Termination of License Activities.*

The current financial guarantee, maintained in the form of irrevocable letter of credit for $138.2 million, was accepted by the Commission in May 2024.

4.0 CONCLUDING REMARKS

Cameco is committed to the safe, clean and reliable operations of all of its facilities and continually strives to improve safety performance and processes to ensure the safety of both its employees and the people in neighbouring communities.

During the current licence period, PHCF exhibited strong performance in all safety and control areas. As a result of the effective programs, plans and procedures in place, the conversion facility was able to maintain individual radiation exposures well below all regulatory dose limits. In addition, environmental emissions continued to be controlled to levels that are a fraction of the regulatory limits, and public radiation exposures are also well below the regulatory limits.

Cameco's relationship with our neighboring communities remains strong and we are committed to maintaining these strong relationships.

As described above, Cameco is committed to continual improvement in all aspects of the PHCF performance. The following have been identified as priorities for the next licensing period:

- Alignment of site programs with standardized regulatory expectations as described in REGDOCS

Appendix 5: Curve Lake 2024 Annual Report

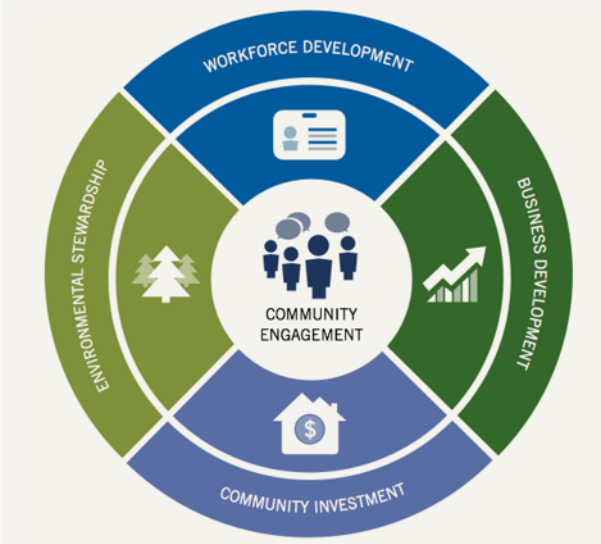
Cameco

2024 Annual Report

Curve Lake First Nation and Cameco Corporation

Prepared by Jennifer Dingman, Cameco Corporation

Introduction



Since 2021, Cameco and Curve Lake First Nation (CLFN) have actively engaged in fostering mutual learning and relationship building. Through joint meetings, facility tours and sharing of information, including annual and quarterly reports, CLFN has gained valuable insights into Cameco's local operations. Additionally, Cameco has participated in CLFN's Alternative Routes Job Fairs, Harvester Meetings and annual Pow Wow celebrations, demonstrating its commitment to collaboration and community engagement.

In May 2023, CLFN and Cameco signed a Relationship Agreement built upon a Four-Pillar Framework: Education and Workforce Development; Business Development; Community Investment; and Community Engagement and Environmental Stewardship.

The relationship between CLFN and Cameco continues to grow, rooted in shared interests and a commitment to meaningful relationship building. The 2024 calendar year saw several key initiatives and collaborative efforts that strengthened mutual understanding, supported community priorities and laid the groundwork for future endeavours. This report highlights milestones, meetings and engagements in 2024.

Northern Mine Tour

Cameco's Fuel Services Division hosted CLFN for a Northern Mine Tour in June. The visit included an educational tour of Cameco's Cigar Lake Mine and a cultural immersion experience in the northern community of Pinehouse. The visit aimed to enhance understanding of the nuclear fuel cycle and its safety measures, while also fostering community connections through participation in local traditions and community events.

> ***"The tour of the Cigar Lake Mine was truly an unparalleled experience. Seeing the advanced and rigorous safety protocols in action provided us with a profound appreciation for the mining industry and its role in energy production for the people of Ontario."***
>
> - Lois Taylor, CLFN, consultation lead, resources and relationships

> ***"The combination of technical knowledge from the mine tour and the cultural immersion in Pinehouse has provided us with a unique perspective. The blend of these experiences is something that we will personally cherish."***
>
> - Paige Williams, CLFN, manager of consultation

The mine tour provided a comprehensive overview of the Cigar Lake mining operation, focusing on stringent safety measures and environmental protections. A highlight while underground was the high-pressure jet-bore, a mining technique developed specifically for the uranium ore deposits at Cigar Lake. Above ground, the tour included the employee's living quarters, recreational facilities and cafeteria.

The visit to Cigar Lake Mine and the Pinehouse community offered CLFN firsthand understanding of the front mining process and highlighted safety and environmental protection throughout the nuclear energy process.

Figure 1: **Cigar Lake Mine -** *Curve Lake First Nation and Cameco representatives during a visit to Cigar Lake Mine in June 2024.*

Figure 2: Curve Lake First Nation - Paige Williams, CLFN leading Cameco representatives during the community visit.

Curve Lake First Nation Community Visit

On October 29, 2024, Curve Lake First Nation (CLFN) welcomed representatives from Cameco for a community visit, marking a meaningful step in fostering stronger connections. By hosting Cameco, CLFN provided a valuable opportunity to share cultural perspectives and local insights, strengthening the relationship and building on the foundation of trust. This exchange underscored both Cameco's and CLFN's dedication to meaningful relationships that enhance knowledge, cultural appreciation, and long-term cooperation.

> ***"Being invited into the community, to share the day with Curve Lake First Nation was a privilege for all of us. This experience continues to build trust and respect as taking the time to learn from one another is essential to strong relationship building and future growth."***
>
> - Dale Clark vice-president, Cameco's Fuel Services Division

A guided boat tour allowed CLFN to share insights into their rich history on the waterways as well as the many traditions tied to Fox Island and the surrounding area. The group was introduced to a culturally significant species, Manoomin (Wild Rice), learning how it is planted, grown and harvested today. The group also learned about the invasive Reed species Phragmites, which thrive in wetlands along Ontario's shorelines, affecting local ecosystems and species including Manoomin.

"It is so important to take the time to learn from one another and we are grateful to Curve Lake for giving us this unique experience. It's not always about the industry or daily work – it's about building relationships and ensuring a foundation of trust. This is about creating connections that last for the long-term."

- Dale Clark vice-president, Cameco's Fuel Services Division

On land, the community tour showcased CLFN's Aquaponics facility, currently in its late development stage combining aquaculture and hydroponics in the same greenhouse facility. Another key highlight was the newly constructed water tower, a landmark that has begun to transform the community's landscape.

Figure 3: Curve Lake First Nation - Cameco representatives visiting Curve Lake First Nation's geodome.

Community Investment

Cameco provides funding for select community investment opportunities approved by Chief and Council. In 2024, Cameco contributed to the 71st Annual Pow Wow – a celebration of ceremony, dance and song that brought together participants from other First Nations as well as visitors from near and far. The CLFN Environmental Program received funding to support its initiative to manage invasive Phragmites, a species that thrives in wetlands and along Ontario's shorelines, posing a threat to local ecosystems.

Key Engagement & Initiatives

Environmental Working Group: The Environmental Working Group (EWG) serves as a platform for collaboration and the exchange of information on shared environmental interests with respect to Cameco's operations. In 2024, the EWG met three times making progress toward the groups objectives to explore a harvest food study and scholarship program for CLFN as well as participate in tours of Port Hope's Conversion Facility and Cameco Fuel Manufacturing.

- **March 6:** Planning for 2024 deliverables
- **June 19-21:** Cameco's hosted CLFN in Saskatchewan for an educational tour of Cameco's Cigar Lake Mine and a cultural immersion experience in the northern community of Pinehouse.
- **August 21:** Cameco provided tours of its Port Hope Conversion Facility (PHCF) and Cameco Fuel Manufacturing (CFM). These tours provided valuable insights into Cameco's operations, fostering transparency and understanding.
- **November 14:** The meeting focused on developing two key initiatives for 2025: exploring a Harvest Food Study and development of a Scholarship Program. These initiatives aim to address community priorities and strengthen the relationship's impact.

Figure 4: Curve Lake First Nation - CLFN representatives took Cameco staff on a boat tour during the community visit in October 2024.

Exchange of Information with CLFN

Energize Newsletters: On a quarterly basis, Cameco produces a newsletter called 'Energize' that is mailed to all residents within Port Hope. Energize provides the community with key information and updates with regards to the facilities and operations. Community engagement activities are also highlighted. Energize is shared electronically with CLFN.

- Spring edition shared on Aug 19, 2024
- Summer edition shared on September 16, 2024
- Fall edition shared on December 9, 2024

Visit the media library at www.camecofuel.com/media/media-library to view past and present copies of Energize.

Compliance Reports for PHCF and CFM

Quarterly Reports (emailed to CLFN):

- January 4, 2024: Q3 2023 Compliance Reports
- March 4, 2024: Q4 2023 Compliance Reports
- June 3, 2024: Q1 2024 Compliance Reports
- October 16, 2024: Q2 2024 Compliance Reports
- November 29, 2024: Q3 Compliance Reports

Annual Compliance Reports (emailed to CLFN)

- 2023 Annual Compliance Report for PHCF and CFM sent to CLFN on April 23, 2024

Cameco's Annual and Quarterly compliance reports are available at www.camecofuel.com/media/media-library.

Looking Ahead: 2025 and Beyond

The relationship between Curve Lake First Nation and Cameco continues to evolve, with exciting projects planned for 2025.

Harvest Food Study:

This initiative aims to support CLFN members in being informed about harvesting food within a designated area of the territory by examining current harvesting practices. Cameco and CLFN will work together to determine the study parameters.

Scholarship:

A new scholarship program designed to support CLFN members pursuing higher education and skills development. Cameco looks forward to assisting CLFN in the development of this important program and its implementation in 2025.

These efforts, along with ongoing dialogue and collaboration, reaffirm the shared focus on mutual growth and respect.

Acknowledgement

Cameco extends its gratitude to Chief Knott, the CLFN community, and all committee members and consultants who have contributed to the success of our on-going relationship. Your dedication and insight provide the foundation for this strong and meaningful relationship.

As Cameco reflects on the achievements of 2024, we are inspired by the progress made and the opportunities ahead. The partnership between CLFN and Cameco is a testament to the power of collaboration and shared purpose.

Curve Lake First Nation also extends gratitude and appreciation to Cameco and the individuals at Cameco who have been instrumental in making us feel welcome and valued in our interactions. The road shared thus far has opened up pathways and possibilities. We look forward to the journeys to come as we demonstrate our collective desire to build reciprocal and meaningful relationships with each other.