2024 Annual Compliance Monitoring
&
Operational Performance Report

Reporting Period January 1 – December 31, 2024

Blind River Refinery
Operating Licence
FFOL-3632.00/2032

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Blind River, Ontario
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Submitted to:
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Executive Summary

Cameco Corporation (Cameco) is a major supplier of uranium processing services required to produce nuclear fuel for the generation of safe, clean, and reliable electricity around the world. Cameco's Fuel Services Division (FSD) is comprised of the Blind River Refinery (BRR), the Port Hope Conversion Facility (PHCF), Cameco Fuel Manufacturing Inc. (CFM) and a divisional head office located in Port Hope, Ontario.

Cameco operates a Class IB nuclear facility in Blind River, Ontario and employs approximately 165 workers. In 2023, the facility operated under fuel facility licence FFL-3632.00/2032, valid until February 28, 2032.

BRR processes natural uranium ore concentrates into natural uranium trioxide (UO_3). Cameco receives uranium ore concentrates from mines and mills worldwide. In 2023, BRR had licensed production capacity of 18,000 tonnes of uranium as UO_3. The majority of the UO_3 produced at BRR is shipped to the PHCF, where it is converted to either uranium dioxide (UO_2) or uranium hexafluoride (UF_6). BRR also prepares and ships small quantities of UO_3 to other customers around the world who are licensed by the CNSC or the equivalent authority in another country.

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 local residents. Corporate policies and programs, including the Safety, Health, Environment and Quality (SHEQ) policy, provide guidance and direction for the development of site-based programs and procedures. BRR also has a Facility Licensing Manual (FLM) that describes the commitment by Cameco Corporation to operate a safe and efficient nuclear facility which meets the requirements of the CNSC.

BRR continues to maintain the safety analysis for its site operations. The approach used to assess risks to workers, the public and the environment is described in the Safety Report for the site.

At BRR changes to the physical design of equipment, processes and the facility with the potential to impact safety are evaluated using a design control process from project planning through to completion of the project. This review identifies impacts and potential impacts to the environment and health and safety. New denitration pots were installed in the refinery in 2023 to provide redundancy for maintenance on existing equipment. Replacement of components of emissions control systems were made to improve the operation of fume and dust control systems in the refinery.

BRR has programs and procedures that ensure the facility is operated in a safe, clean and reliable manner. BRR has an established Preventive Maintenance (PM) program. All PM tasks are initiated and documented through the work notification system in Systems Applications and Products (SAP); a corporate-wide enterprise application software for asset management,

accounting, and purchasing functions. BRR maintains various programs, plans and procedures in the areas of health and safety, radiation protection, environment protection, emergency response, fire protection, waste management, and training. A SAT based training programs for all necessary positions is in place.

As a result of these programs, plans and procedures, BRR's operations have maintained radiation exposures well below the dose limits. Environmental emissions are being controlled to levels that are a fraction of the regulatory limits, and public radiation exposures are also well below the regulatory limits.

BRR has an Emergency Response Plan in place to cover potential on-site and off-site emergency situations. BRR also has a comprehensive Fire Protection Program (FPP) in place to minimize both the probability of occurrence and the consequence of fire at the facility.

Annual Third-Party Reviews of compliance with the inspection requirements specified in the site Licence Conditions Handbook (LCH) are carried out. The site also maintains a Fire Hazard Analysis (FHA). Lastly, BRR has a mutual aid agreement in effect with the Town of Blind River Fire Department.

BRR has a Waste Management Plan which meets applicable requirements. The refinery also has an approved Preliminary Decommissioning Plan and financial guarantee.

The security plan in place for BRR provides the basis for security operations at the facility and identifies the systems and processes in place to meet security program objectives.

A comprehensive uranium inventory system to demonstrate compliance with Safeguards requirements is maintained by BRR. Receipts and shipments of natural uranium material are recorded, and all uranium transfer reports are submitted to CNSC. In 2024 three short notice random inspections (SNRI), a Complementary Access (CA) inspection, two Design Information Verification (DIV), and a Physical Inventory Verification (PIV) were conducted by the International Atomic Energy Agency (IAEA).

The scope of transportation activities at BRR includes the transport of Class 7 radioactive materials outlined in the Transportation of Dangerous Goods Act and associated regulation. Shipments included both incoming uranium ore concentrate from around the world and outgoing UO_3.

Cameco works to build and sustain the trust of local residents by acting as a good corporate citizen in the communities in which it operates. A key element of building and sustaining that trust is a commitment to provide those in the community with accurate and transparent reporting of our performance. In 2024, Cameco continued engagement activities with Mississauga First Nation (MFN) to work toward formalizing the relationship.

Cameco works to build and sustain the trust of local communities by acting as a good corporate citizen in the communities it operates. A key element of building and sustaining that trust is a commitment to provide those in the community with accurate and transparent reporting of environmental practices and performance. Cameco continued its comprehensive approach to community outreach in 2024 with the continuation of community outreach, newsletters, and other information initiatives.

Cameco is committed to providing information to interested Indigenous communities and proactively reaches out to provide information or extend invitations to Cameco initiatives.

BRR's closest neighbour, the Mississauga First Nation, is kept informed of the Refinery's operations and activities through meetings, phone calls and emails.

In conclusion, in 2024, the BRR continued to operate within the framework of the *Nuclear Safety and Control Act* (NSCA) and met all requirements as per its operating licence.

1.0 INTRODUCTION

1.1 General Introduction

Cameco Corporation (Cameco) is a major supplier of uranium processing services required to produce nuclear fuel for the generation of safe, clean and reliable electricity around the world.

Cameco's Fuel Services Division (FSD) is comprised of the Blind River Refinery (BRR), the Port Hope Conversion Facility (PHCF), Cameco Fuel Manufacturing Inc. (CFM), and a divisional head office located in Port Hope, Ontario.

BRR is the world's largest commercial uranium refinery and has been in operation since 1983.

BRR (Figure 1) is located approximately five kilometers to the west of the Town of Blind River in the District of Algoma. The property encompasses an area of approximately 258 hectares in total, which includes a secured area of approximately 11 hectares, representing the CNSC-licensed area. Cameco has a lease arrangement for an additional 195 hectares to the east of the existing property boundary. While located in Blind River, the refinery is also located adjacent to and south of the Mississauga First Nation, our closest neighbor.

Figure 1 Blind River Refinery

BRR operates a Class 1B nuclear facility in Blind River, Ontario. The fuel facility licence FFL-3632.0/2032 was in effect throughout 2023. The current licensed production capacity is 18,000 tonnes of uranium as UO_3, but provision has been made to increase capacity to 24,000 tonnes of uranium as UO_3, once certain conditions have been met and the business climate warrants.

BRR processes natural uranium ore concentrates into natural uranium trioxide (UO_3). Cameco receives uranium ore concentrates from mines and mills worldwide. In 2023, BRR was licensed to produce up to 18,000 tonnes of uranium as UO_3. The majority of the UO_3 produced at BRR is shipped to the PHCF, where it is converted to either uranium dioxide (UO_2) or uranium hexafluoride (UF_6). BRR also prepares and ships UO_3 to other customers around the world who are licensed by the CNSC or the equivalent authority in another country. BRR employs approximately 165 workers.

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.

BRR 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. The refinery employs qualified personnel and has established a strong management system to ensure compliance with other federal and provincial regulations.

As a result of these actions, BRR has continued to produce uranium products for the Canadian and international nuclear industry while at the same time maintaining radiation exposures to the workforce well below the dose limits. Environmental emissions and public radiation exposures are being controlled to levels that are a fraction of the regulatory limits.

The purpose of this document is to summarize the performance of BRR in 2024 and to demonstrate that BRR has met the regulatory requirements of the *Nuclear Safety and Control Act*. It is submitted in accordance with the CNSC license FFL-3632.00/2032 section 3.2 and organized based on the CNSC REGDOC 3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*. There were no operational challenges experienced at the facility. The workforce increased in numbers in 2024 compared to the previous year.

There was one reportable spill and one reportable occurrence at the Blind River refinery in 2024.

In addition to the CNSC, BRR is regulated by other federal and provincial regulators, such as the Ontario Ministry of the Environment, Conservation and Parks (MECP), Environment and Climate Change Canada (ECCC), Employment and Social Development Canada (ESDC) and Transport Canada (TC). BRR is compliant with federal, provincial and municipal regulations.

The submission of this report fulfills the requirement of section 3.2 of the operating licence for BRR (FFL-3632.00/2032). The annual compliance report was prepared in accordance with the CNSC document REGDOC 3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*. This report describes the facility operations and provides a summary of the Safety and Control Areas for 2024 as listed in the Licence Conditions Handbook (LCH).

The acronyms in Table 1 are used in this report.

Table 1

List of Acronyms	
Acronym	**Description**
ALARA	As Low As Reasonably Achievable
BRFD	Blind River Fire Department
BRR	Blind River Refinery
CCM	Contaminated Combustible Material
CCME	Canadian Council of Ministers of the Environment
CFM	Cameco Fuel Manufacturing
CGSB	Canadian General Standards Board
CNC	Contaminated Non-combustible Material
CNSC	Canadian Nuclear Safety Commission
DRaff	Dried Raffinate
DRL	Derived Release Limit
ECCC	Environment and Climate Change Canada
ECA	Environmental Compliance Approval
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESDC	Employment and Social Development Canada
FFOL	Fuel Facility Operating Licence
FHA	Fire Hazard Analysis
FHSC	Facility Health and Safety Committee
FLM	Facility Licensing Manual
FPP	Fire Protection Program
FSD	Fuel Services Division
IAEA	International Atomic Energy Agency
KPI	Key Performance Indicator
LCH	Licence Conditions Handbook
MFN	Mississauga First Nation
MNR	Ministry of Natural Resources

List of Acronyms	
Acronym	**Description**
MECP	Ministry of the Environment, Conservation and Parks
mSv	millisievert
NEW	Nuclear Energy Worker
NFPA	National Fire Protection Association
NOx	Nitrogen Oxides
NPRI	National Pollutant Release Inventory
OSL	Optically Stimulated Luminescence
PHCF	Port Hope Conversion Facility
PIP	Public Information Program
PIV	Physical Inventory Verification
PM	Preventive Maintenance
PWQO	Provincial Water Quality Objectives
RL	Respirator Limit
S&FP	Sample & Feed Preparation
SAT	Systematic Approach to Training
SHEQ	Safety Health Environment and Quality
SNRI	Short Notice Random Inspection
SSC	Systems Structures and Components
TC	Transport Canada
TED	Total Effective Dose
TRA	Toxics Reduction Act
UF_6	Uranium Hexafluoride
ug U/L	micrograms of uranium per litre
UOC	Uranium Ore Concentrate
UO_2	Uranium Dioxide
UO_3	Uranium Trioxide
uSv	microsievert

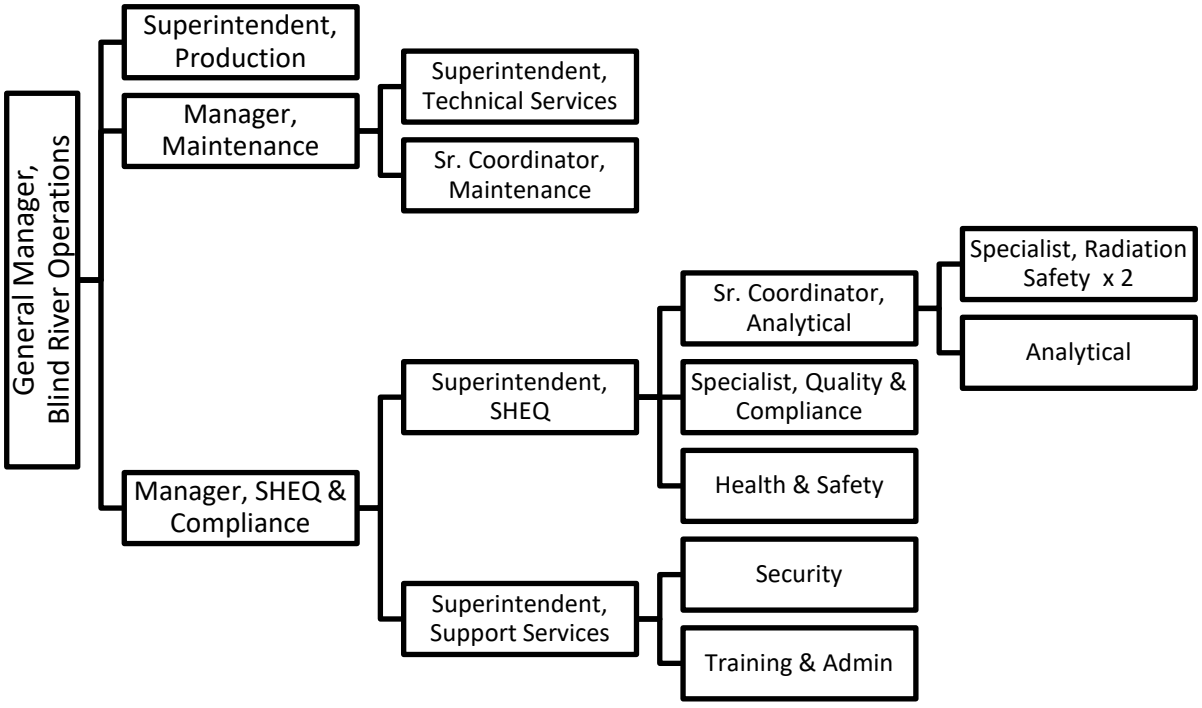
1.2 Facility Operation

Cameco continues to strive for operational excellence at all of its facilities through consistent application of management systems across its operations to ensure that they operate in a safe, clean and reliable manner. Corporate policies and programs, including that for Safety, Health, Environment and Quality (SHEQ) provide guidance and direction for all site-based programs and procedures that define the BRR Quality Management System.

The general manager of the Blind River refinery is accountable for the programs and procedures for operating and maintaining the facility. The responsibilities for these programs and procedures have been delegated amongst the management team at BRR and their respective personnel. All members of the BRR management team are held accountable for the roles and responsibilities that they hold.

There was a net increase of twelve employees in 2024, taking into account new hires, changes in employment status and terminations/retirements. There were significant changes to roles, responsibilities, and authority in 2024 as illustrated in Figure 2. The CNSC was notified in writing of changes to personnel authorized to act in dealings with the CNSC.

Figure 2 BRR Organizational Chart



BRR has a License Conditions Handbook (LCH), issued by the CNSC. The purpose of this handbook is to establish and consolidate into one document the compliance framework related to the Cameco BRR licence. The LCH outlines CNSC expectations by defining the licensing basis, explaining the regulatory context related to each licence condition, and identifying the verification criteria for each licence condition.

BRR also has a Facility Licensing Manual (FLM) that describes the commitment by Cameco Corporation to operate a safe and efficient nuclear facility and how the requirements of the CNSC are met at the refinery through the use of programs to ensure that the licensed activities at the site are controlled and conducted in a safe manner. The licensed activities are controlled by the use of documented procedures and the provision of qualified personnel. Controls are established commensurate with the safety significance of the activity, system or equipment.

In addition to Cameco requirements regarding management systems, the facility's management systems program has been designed to meet *REGDOC-2.1.1, Management System* and *CSA N286-12 Management system requirements for nuclear facilities*. This program provides the controls to ensure all processes are conducted in a safe manner and that processes applying to licensed activities are conducted in accordance with applicable CNSC quality requirements and other regulatory requirements. The application of the quality requirements is scaled according to the safety significance (complexity and hazard potential) of a particular activity.

At BRR changes to the physical design of equipment, processes and the facility with the potential to impact safety are evaluated using an internal design control process from project planning through to completion of the project. This review identifies impacts and potential impacts to the environment as well as to health and safety.

During 2024, the BRR operated routinely with no major operating problems. Tote bin availability and performance of the denitration area contributed to minor production losses throughout the year. Procurement of additional tote bins and installation of new denitration pots occurred during the summer shutdown. Upon startup after the summer shutdown, these additional Denitration pots and 40 new tote bins alleviated some of the operating problems experienced at the beginning of 2024 and previous years. The diluent previously used (Isopar) in our solvent extraction was replaced with a new diluent called Linpar. This new diluent has resulted in higher throughput in Solvent Extraction area as well as improved molybdenum rejection allowing the ability to process high molybdenum concentrates.

The Blind River refinery carried out the annual summer shutdown to allow for scheduled maintenance work, employee vacation time, and to match Cameco Port Hope Conversion Facility's (PHCF) production requirements. During the five-week shutdown, employee vacations were staggered to accommodate uranium ore concentrate deliveries, and routine

maintenance activities. The UO_3 plant also ran over the Christmas period resulting in production personnel and essential employees working during this holiday period

BRR also has shorter shutdown periods throughout the year, ranging from a few hours to a few weeks. The shorter shutdowns are typically extended power outages due to storm events and/or to effect critical maintenance repairs, while the longer shutdowns are typically inventory or production requirements related.

Annual Third-Party Reviews of compliance with the inspection requirements specified in the site Licence Conditions Handbook (LCH) are carried out, with a copy of the report submitted to the CNSC.

A Facility Health and Safety Committee (FHSC) has been in place for many years and includes representation from both management and workers. The Sr. Coordinator, Analytical Services, Specialist, Radiation Safety, Superintendent, SHEQ and the Health Safety Officer are members of this committee. There is also worker representation from all departments on this committee, including production, maintenance, powerhouse, analytical services, security, and administration. In addition to conventional health and safety issues, the committee also discusses radiation and environment related issues. A separate ALARA committee is also in place.

As part of the management system programs, internal audits are conducted routinely to assess the level of conformance to these management systems. Starting in 2017 Cameco's corporate SHEQ group assumed responsibility for completion of required internal audits at Cameco licensed facilities, including the BRR.

The internal audit program encompasses all key areas of refinery operations including environmental protection, radiation safety, occupational health and safety and quality management. The audits include assessment of both conformance and legal compliance. The most recent corporate SHEQ audit was conducted in 2024. Third-party audits and internal assessments were also completed in 2024.

A 2024 audit summary is provided to the CNSC under separate confidential correspondence.

The performance of the facility in 2024 demonstrates that Cameco is qualified to carry out the activities permitted under the Licence. All activities on the defined site in the licence are subject to the *Nuclear Safety and Control Act* (NSCA). Cameco is committed 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.

1.3 Facility Modification

There were no modifications affecting the safety analysis of the licensed facility made in 2024 that required written approval of the Commission, or a person authorized by the Commission.

The following BRR documents referenced in the LCH were revised in 2024:

- EP 100 Emergency Response Plan
- FS 100 Fire Safety Plan
- FS 200 Fire Protection Program
- MA 100 Preventative Maintenance System
- BR AM 300 Training Program Manual
- PR 33 Design Control
- RS 100 Radiation Safety Program Manual

2.0 SAFETY AND CONTROL AREAS

2.1 Management

2.1.1 Management System

This safety and control area covers the framework which 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.

BRR's management systems program identifies the controls required to ensure all processes are conducted in a safe manner and that processes applying to licensed activities are conducted in accordance with applicable CNSC management systems requirements and other regulatory requirements. The application of management systems requirements is scaled according to the complexity and hazard potential of a particular activity.

An annual site management review meeting is held to review the suitability, adequacy, and effectiveness of the SHEQ policy and the site programs and procedures to ensure conformance to both Cameco and regulatory requirements. The 2024 annual management review meeting was held on April 3, 2025, and concluded that while there are opportunities for improvement, the site management systems were suitable, adequate, and effective.

In 2017, the Corporate SHEQ Audit group assumed responsibility for all required site internal SHEQ audits, Corporate SHEQ audits and compliance audits. With respect to compliance audits, they are conducted biennially against applicable federal and provincial environmental legislation. All regulations are audited at least once every three years. In 2024, internal SHEQ audits were conducted against the following site programs: environmental compliance, radiation compliance, transportation compliance, health and safety and emergency management.

There were also a number of external audits/inspections carried by third parties as follows:

- A third-party audit of the Fuel Services Internal Dosimetry Program. This audit is a requirement under the quality assurance program developed for the Internal Dosimetry Services License issued to the Cameco FSD sites.
- An annual third-party facility condition inspection to assess compliance with requirements of the National Fire Code 2015 and CSA N393-13
- The Boiler Inspection and Insurance Company of Canada (BI&I) carried out an inspection of the facility in 2024
- Three short notice random inspections (SNRI), two design information verifications (DIV), a Complementary Access (CA) inspection and one physical inventory verification (PIV) were completed by the International Atomic Energy Agency (IAEA)

It should be noted that the above list does not include inspections completed by CNSC staff as part of their oversight of licensed activities. Audits, inspections and associated corrective actions are entered in the Cameco Incident Reporting System (CIRS) to address any issues identified. Audits will not be discussed elsewhere in this report. Details and findings related to the audit program will be submitted under separate cover due to the confidential nature of the information.

All procedures that support licensed activity are subject to the site document control process as described in the various site document control procedures. Procedures that support the licensed activity are maintained in electronic format on a database available to all site personnel. This includes, but is not limited to, procedures for operating and maintaining the facility, all environmental health and safety procedures, radiation protection and management systems. A total of 290 site documents were either reviewed and updated, or created, in 2024.

In 2024, BRR maintained its Management Systems Program Manual in compliance with *CSA N286-12 Management System requirements for nuclear facilities*.

BRR follows a systematic evaluation method for its safety culture self-assessments which are generally completed every five years. The most recent self-assessment was completed in 2023. Cameco uses these assessments to shape the safety program improvements at each site. The report from that assessment was issued in 2023 and indicated some shift in overall perception from previous assessments, perhaps linked to significant turnover in workforce in recent years. Site leadership is developing specific actions to address items identified in the report.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on results from various external audits, internal assessments and a review of events in CIRS.

2.1.2 Human Performance Management

This safety and control area 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 their duties.

BRR maintains a sufficient number of qualified workers as well as the minimum number of responsible people to carry on the licensed activities safely and in accordance with the *Nuclear Safety and Control Act*, the CNSC REGDOC 2.2.5 *Minimum Staff Complement*, and the BRR's LCH.

BRR has a number of programs, procedures and processes that combined form the framework for a safe environment and foster a sustainable safety culture. Management has focused on enhancing the site's safety culture by establishing comprehensive environmental, radiation, training, and health and safety programs. These programs have contributed to the development of processes and practices such as the use of hazard recognition cards for maintenance activities and self-audit hazard recognition cards for other types of work.

All employees are encouraged to build and maintain a questioning attitude with respect to health, safety, radiation protection and environmental issues. Cameco has implemented a standardized, systematic approach to training (SAT) across all of its operations. SAT applies a robust, risk-informed system to analyze and track training requirements and develop and deliver appropriate training programs. The SAT process covers the initial training of employees, routine re-qualification, as well as re-qualification of employees after an extended absence. The design and development of SAT-based training programs for positions considered "in-scope" was completed in 2011. Mandatory federal, provincial and/or Cameco-required training is tracked and trended.

Mandatory federal, provincial and/or Cameco-required training is tracked and trended, with 93.6% attendance achieved in 2024, a slight increase from 2023. This training ensured that all personnel have the level of training related to radiation safety, fire safety, chemical safety, on site emergency arrangements, environmental protection and conventional health and safety, appropriate for their duties. Employees on short or long-term absences due to illness or disability may affect these statistics. There are numerous processes in place to ensure employees are fully qualified to carry out the activities they have been assigned and also to ensure that employees who miss required training sessions are identified and scheduled to attend a subsequent training session.

BRR is a 24 hour a day, seven day a week operation. Following the requirements of Part III of the Canada Labour Code, BRR has defined maximum hours of work in a shift cycle for all employees. In addition, to ensure qualified personnel are available on-site to conduct licensed

activities in a safe manner, minimum crew complements for UO_3 operations and emergency response have been defined. In 2024, the Blind River refinery maintained the minimum number of qualified personnel.

A range of programs are in place to ensure that employees are fit for duty. They cover human resource matters such as a program for alcohol and substance abuse, safe haven, violence in the workplace, respectful workplace as well as addressing more general health matters such as medical surveillance and radiation protection monitoring. Cameco has an audit program that routinely looks at various aspects of the site training program. Corrective actions are taken to address any issues identified during these audits.

The site mentoring program ensures new employees are paired with experienced workers for the first six months of their employment. The mentoring process helps to ensure that new employees are properly trained in how to carry out their duties safely and to minimize risks to people and the environment.

BRR follows a systematic evaluation method for its safety culture self-assessments which are generally completed every five years. The most recent self-assessment was completed in 2023. Cameco uses these assessments to shape the safety program improvements at each site. The report from that assessment was issued in 2023 and indicated the site is engaged on safety issues and has a high degree of trust and confidence in the site management. Security culture was also included in the safety culture assessment for the first time and no specific issues were noted.

BRR had 19 days where the minimum complement for qualified ERT personnel was not met in 2024. In these circumstances, ERT leaders are directed to call 911 and additional ERT members in immediately upon assessing the emergency. There are 47 fully qualified ERT personnel and 6 ERT members in the process of being trained.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on review of training statistics and results from various external audits, internal assessments and a review of events in CIRS.

2.1.3 Operating Performance

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

In 2024, BRR continued to operate in a manner that supports safe, clean, and reliable production and in compliance with applicable acts and regulations, as well as site programs and procedures.

The refinery carried out the annual schedule summer shutdown of the UO_3 plant between June 27 and August 6, 2024. During the shutdown, employee vacations were staggered to accommodate uranium ore concentrate deliveries, and routine maintenance activities.

There were three reportable events in 2024. These included a glycol release to the sewage treatment plant into the effluent discharge, an overflow of sediment to the river related to an offsite sinkhole near the groundwater supply wells and an incipient level fire reported to the CNSC due to ERT activation.

BRR operated in accordance with site programs and procedures and did not exceed any CNSC regulatory limits during the year. Annual operating targets are set and key performance indicators established for refinery operations. The annual licensed production limit of 18,000 tonnes of uranium as UO_3 was not exceeded in 2024.

As noted previously in this report, Cameco has an internal audit program that routinely looks at various aspects of site operations related to the licensed activities. BRR also had some external audits completed in 2024, as identified in Section 2.1.1 of this report.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on a review of the preventive maintenance program key performance indicators (KPI's) and operational production targets.

2.2 Facility and Equipment

2.2.1 Safety Analysis

This safety and control area 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.

BRR has a safety analysis report that documents the detailed safety analysis carried out for the facility. The safety report summarizes the systematic review of the site operations to identify and assess hazards and potential risks to the public and environment from BRR operations. Design reviews are done prior to making any plant modifications that may affect the safety case for the refinery, with the site safety analysis report updated periodically to include the findings from design reviews completed since the last revision to the report. BRR's safety analysis report was accepted by the CNSC in 2021.

There were no modifications made in 2024 that affected the safety case for the refinery. The safety significant systems at the facility have been identified and a preventive maintenance program is in place to ensure that the equipment associated with these systems is properly maintained. The preventive maintenance program is assessed annually as part of the site annual management review. There were no issues identified during the most recent review.

The requirements of REGDOC-2.4.4 will be incorporated into the next scheduled review of the safety analysis in September 2026.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective.

2.2.2 Physical Design

This safety and control area 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 considering changes in the external environment.

As part of Cameco's budgeting process for capital expenditures, plant improvements related to physical design are identified and prioritized.

BRR contains numerous types of conventional industrial equipment including storage tanks, conveyors, and associated piping, as well as specialized equipment for the UO_3 refining process.

Changes to the physical design of equipment, processes, and the facility with the potential to impact safety are evaluated from initial planning through to the 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.

BRR has a contractual arrangement with the provincial Technical Standards and Safety Authority (TSSA) to ensure that oversight of pressure retaining components and systems continues to be carried out by a third-party expert. As part of this process, BRR utilizes non-destructive examination techniques to assess the integrity of pressure vessels and related systems. These examinations are primarily done in-house by qualified staff, though qualified third-party experts are used when necessary.

Examples of physical improvements to the site implemented in 2024 include:

- Commissioning of newly installed new denitration pots
- Repairs to HVAC systems and replacement of fume collection components
- Recoating of plant floors
- Upgrade of the Primary Spencer Motor
- Replacement of the 3rd Stage Boildown Flash Chamber

2.2.3 Fitness for Service

This safety and control area covers activities that impact on the physical condition of SSCs, 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.

BRR has programs and procedures that ensure the facility is operated in a safe, clean and reliable manner.

BRR has an established Preventative Maintenance (PM) program as defined in site documentation. All PM tasks are initiated and documented through the site work notification system in SAP, a corporate-wide enterprise application software package for asset management, maintenance management, accounting and purchasing functions. PM plans are issued, reviewed and updated periodically to ensure the PM routines developed continue to be effective and adequate. Key Performance Indicators (KPIs) are in place to monitor the effectiveness of the program. All regulatory related preventive maintenance work orders driven by the preventive maintenance plans were completed in 2024.

BRR has an in-service inspection (ISI) program which applies to both registered and nonregistered piping and vessels in the refinery, including those related to safety significant systems. Technicians performing radiographic, ultrasonic, magnetic particle and liquid penetrant inspections are certified in accordance with the Canadian General Standards Board (CGSB). Test methods have been selected on the basis of the historical record of operating and inspecting the UO_3 plant. They are considered 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.

The NDE in-service inspection (ISI) program was maintained throughout the year with no significant issues identified. In 2024, all ISIs were completed within -10% and +20% of the target date. In addition to the ISI program, a process is in place to identify equipment and components reaching the end of their service life through means such as increased maintenance requirements, lack of availability of replacement parts or manufacturers recommendations. Items identified for replacement are assessed through the design change process and may require a capital expenditure, depending on the nature and cost of the replacement component.

Based on the maintenance related KPIs, the maintenance program, which includes the aging management component, is effective.

Fire protection systems are tested according to an established schedule as outlined in the Fire Protection Program (FPP). Third-party reviews are conducted to confirm required tests and inspections with respect to fire protection are completed and these review reports are submitted to the CNSC.

Process monitoring is conducted through product and intermediate quality control testing (such as chemical analysis) to ensure that the equipment is functioning within design specifications. Additional measures to ensure that equipment is operating as designed include monitoring of environmental systems (i.e., conductivity probes in condensate return lines to detect leaks, in plant uranium-in-air monitoring and real-time stack monitoring for oxides of nitrogen (NOx) as well as operator and specialist (i.e. safety officer and radiation safety officer) inspections.

This safety and control area were assessed as part of the 2024 annual management review and while opportunities for improvement were identified, it is effective based on a review of the preventive maintenance program key performance indicators (KPI's) and a review of events in CIRS.

2.3 Core Control Processes

2.3.1 Radiation Protection

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

The refinery 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 (ALARA). The program includes the following aspects:

- External dosimetry – personal monitoring
- Internal dosimetry – urine analysis & lung counting programs
- Workplace air sampling program
- Respirator program
- Radiation & contamination surveys

The CNSC regulatory limits for effective dose for Nuclear Energy Workers (NEWs) are 50 millisievert (mSv) per year and no more than 100 mSv over a specified five-year period.

For various radiological parameters, Cameco has established action levels, which are well below regulatory limits that may be indicative of a potential loss of control for that specific parameter. These action levels serve as an early warning of a condition that warrants further investigation. In addition, as a continual improvement tool, Cameco has established lower-tier internal administrative levels, which are set below the action levels and provide very early warning of a potential concern. A result above an internal administrative level is also investigated and remedial actions taken if necessary.

There were no CNSC radiation protection action level exceedances reported in 2024.

Radiation protection objectives and targets are established jointly by the site management team and site specialists, including the radiation safety officer, to ensure there is agreement, commitment and awareness of these objectives and targets across all areas of the refinery's operation. These objectives and targets can address, among other things, worker dose reduction initiatives and other projects which examine ways to reduce in-plant uranium-in-air concentrations. Site management ensures necessary resources are allocated to achieve the objectives and targets. Status reports on the objectives and targets are posted on the ALARA bulletin board outside the employee change rooms so that employees can monitor their progress.

Radiation safety objectives completed in 2024 included the review of all radiation training modules and sessions to determine if they can be streamlined. Training needs analysis (TNA) was completed, and no changes were identified. Implementation of the updated CNSC Radiation Protection Regulations SOR/2000-203 as they relate to Pregnant and Breastfeeding Nuclear Energy Workers was completed. Training was completed for all female nuclear energy workers. Implementation of an electronic health screening form was completed. Of the eight radiation safety objectives carried forward into 2024 from previous years, five remain in progress. These objectives include follow-up activities for the Th-230 in DRaff assessment, for additional assessment of potential beta exposures, and implementation of several electronic forms and tracking systems for RP activities as well as an update to the Derived Release Limit report. These objectives will be carried over to 2024, with additional electronic forms being added to the objective. Additional support from the corporate office has been secured to assist completion of these activities in 2025.

As part of the work of the joint workplace health and safety committee, updates on the status of the radiation protection program are discussed at the monthly meetings and employees are encouraged to bring forward any questions or concerns. In addition to this committee, a separate ALARA committee is in place. This committee meets regularly to review and discuss radiation safety related incidents and issues, and to make recommendations for improvements. Projects addressed by the committee in 2024 included ordering new instrumentation to replace the problematic SmartCam's. A new instrument called ICam has been ordered and will be tested at BRR to see if it is superior to the SmartCam's currently in use.

Any issues identified during either regulatory or internal audits are documented in the CIRS database so that corrective actions can be identified and implemented.

At the end of 2024, 93.9% of the required radiation training was completed which includes a variety of radiation safety topics including respirator training, radiation meter training, dosimeter training, procedural review and radiation theory training.

There were 6 radiation-related documents updated in 2024 which included three (3) procedures and three forms related to various aspects of the site program. All radiation safety procedures and forms are reviewed and updated as required on a regular basis.

An inventory of sealed and unsealed sources that are used or possessed on site are listed in the radioisotope source control procedure. There are currently no radioisotopes on site that exceed 50 MBq of a radioactive prescribed substance. Regular inventory of other disk and liquid sources are carried out in accordance with the radioisotope procedure. Results of the 2024 inventory showed that all sources are accounted for and pose no undue risk to workers.

All radiation monitoring devices and instrumentation are routinely checked and calibrated as required. Calibration frequencies are identified, and a calibration schedule maintained. Equipment that is damaged or non-operational is removed from service until it can be repaired and recalibrated. In 2024 new radiation protection monitoring devices/instrumentation were purchased to either augment the existing equipment inventory or to replace non-operational equipment that was deemed no longer repairable.

Calibration of contamination monitoring instrumentation is done in-house or by a qualified third-party vendor. Calibration of gamma survey meters, electronic personal dosimeters and other radiation protection instrumentation such as air flow calibrators and respirator fit testing equipment are also sent off-site for calibration by a qualified third party or new, calibrated instruments purchased.

Dosimetry

Cameco uses a licensed dosimetry services provider accredited by the CNSC. The dosimetry service provides optically stimulated luminescence (OSL) dosimeters to monitor whole body and skin dose for employees, contractors and visitors as required. Ring dosimeters are also issued to certain employees, dependent on their job duties. Dosimeters are changed monthly for operations (production and maintenance) personnel and quarterly for administration and support staff. Results are provided by the dosimetry services provider to both Cameco and to the National Dose Registry.

Internal doses are assigned through urine analysis and lung counting programs which are part of Cameco's licensed internal dosimetry service.

The following tables and graphs summarize individual exposure results. Note that in figures with ranges on the horizontal axis, a range of 1 – 2, for example, means all results are greater than or equal to (≥) 1 and less than (<) 2.

Whole Body Dose

Distributions of 2024 external whole-body dose are shown in Table 2 and Figure 3. 86% of the whole-body exposures were below 1 mSv which is a significant decrease from 80% in 2023. 1% of external whole-body dose results in 2024 were above 5 mSv.

Table 2

2024 Whole Body Dose Distribution	
Dose Range (mSv)	**Percentage of Individuals (%)**
0 – 1	86.5
1 – 2	7.5
2 – 3	2.6
3 – 4	1.8
4 – 5	0.5
> 5	1.0

Figure 3

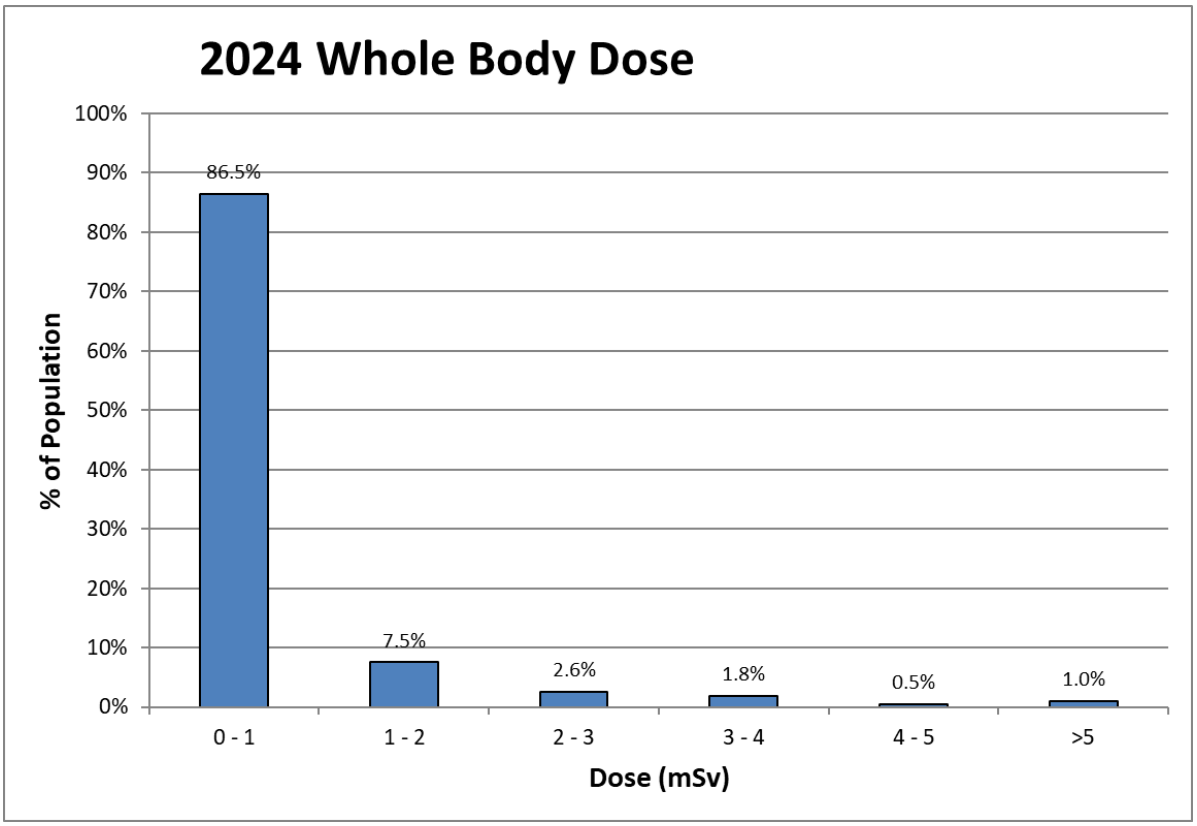


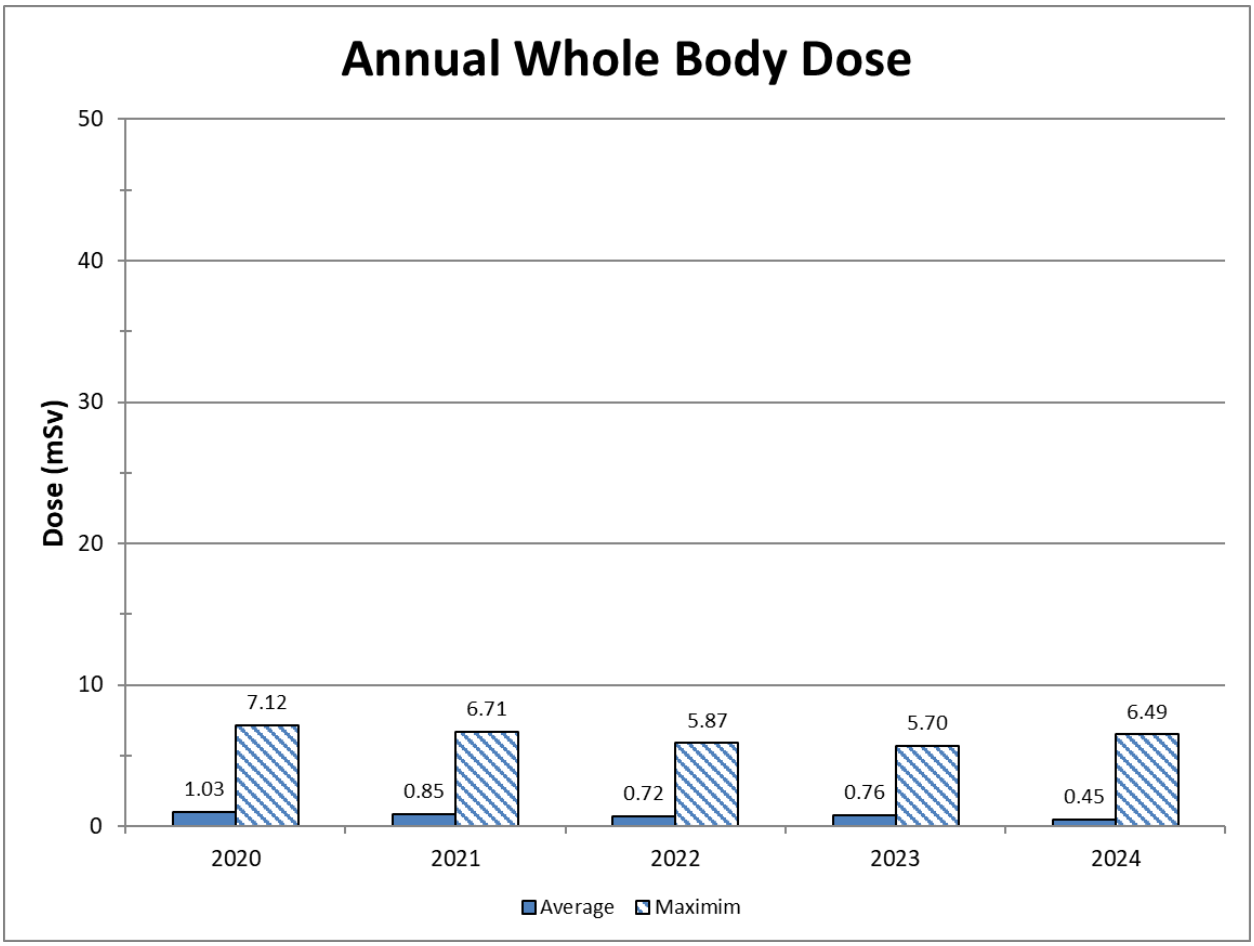
Table 3 and Figure 4 show the employee average and maximum individual external whole-body dose for the five-year period from 2020 – 2024. This data includes contractors with NEW status. The average dose in 2024 was the lowest average dose in the five-year period. The maximum individual external whole-body dose was 6.49 mSv received by an S&FP operator.

Whole body dose is a component of effective dose.

Table 3

2020 – 2024 Whole Body Dose				
Year	**Number of Individuals**	**Minimum (mSv)**	**Average (mSv)**	**Maximum (mSv)**
2020	169	0.0	1.03	7.12
2021	185	0.0	0.85	6.71
2022	207	0.0	0.72	5.87
2023	249	0.0	0.76	5.70
2024	381	0.0	0.45	6.49

Figure 4



Skin Dose

Distributions of 2024 external skin doses are shown in Table 4 and Figure 5. Over 94% of the external skin doses were below 10 mSv. All results remain less than 8% of the regulatory limit of 500 mSv.

Table 4

2024 Skin Dose Distribution	
Dose Range (mSv)	**Percentage of Individuals (%)**
0 – 10	94.3
10 – 20	5.2
20 – 30	0.3
30 – 40	0.3
40 – 50	0
> 50	0

Figure 5

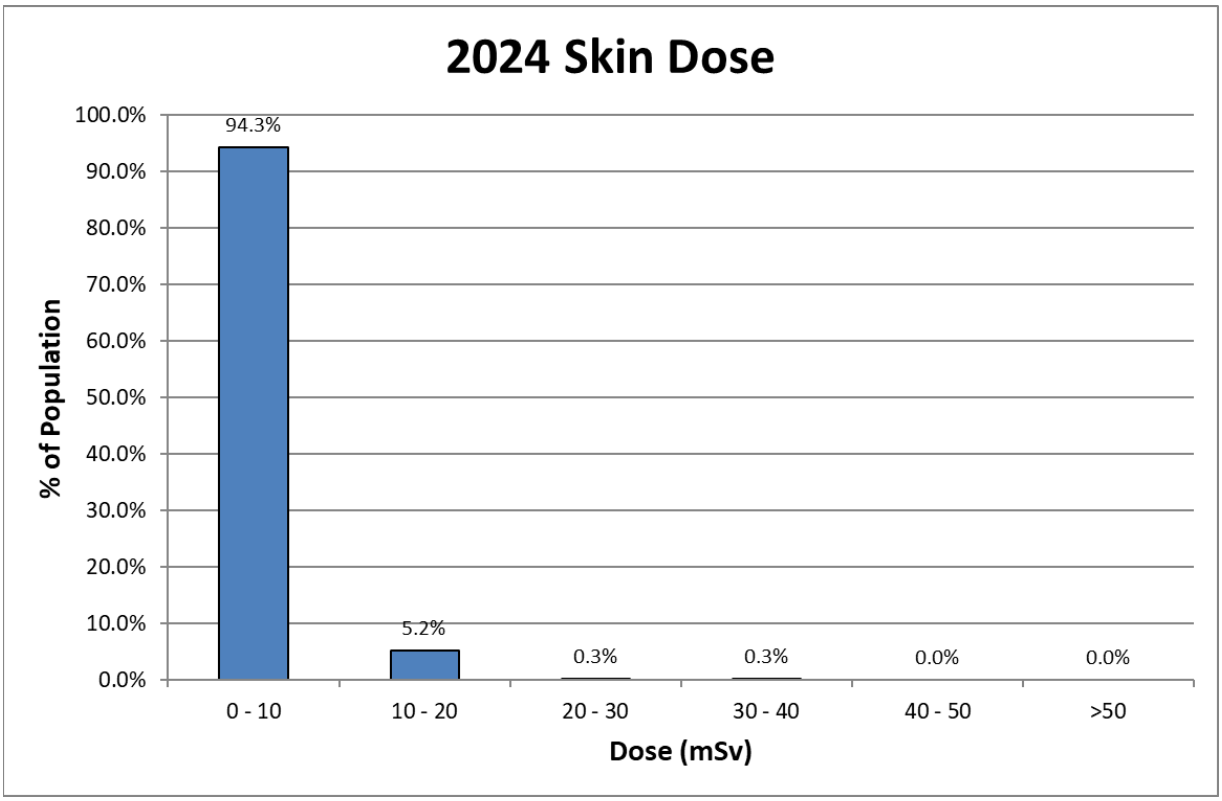
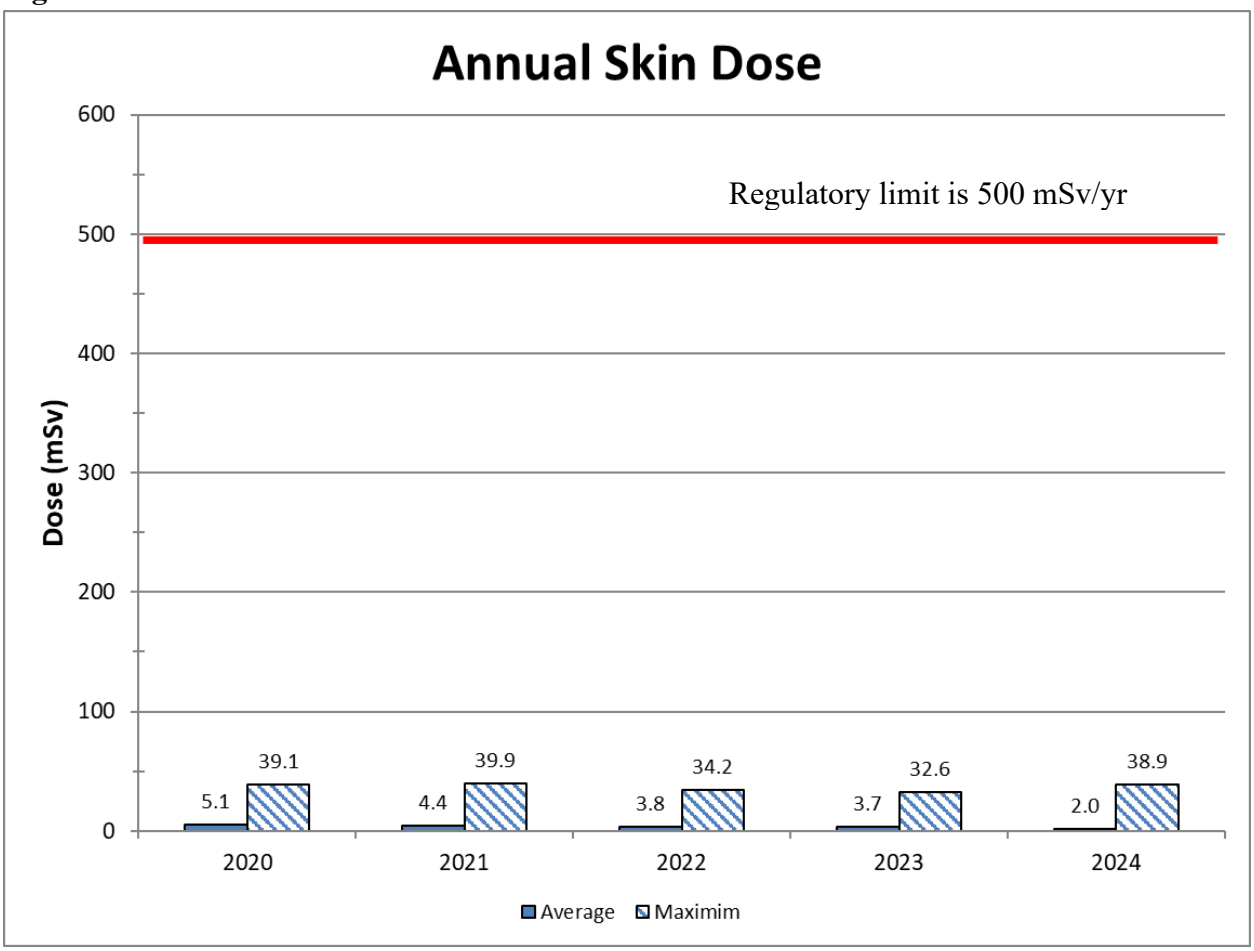


Table 5 and Figure 6 show the employee average and maximum individual skin dose for the five-year period from 2020 – 2024 including contractors (NEW). Average dose was significantly below the range of the previous four years. The maximum individual skin dose was slightly higher than the previous year. The maximum individual dose in 2024 was 38.9 mSv, which is below 8% of the CNSC annual limit of 500 mSv for skin dose. The individual with the highest skin exposure was a production employee.

Table 5

2020 – 2024 Skin Dose				
Year	**Number of Individuals**	**Minimum**	**Average**	**Maximum**
2020	169	0	5.1	39.1
2021	187	0	4.4	39.9
2022	207	0	3.8	34.2
2023	255	0	3.7	32.6
2024	385	0	2.0	38.9

Figure 6



Eye Dose

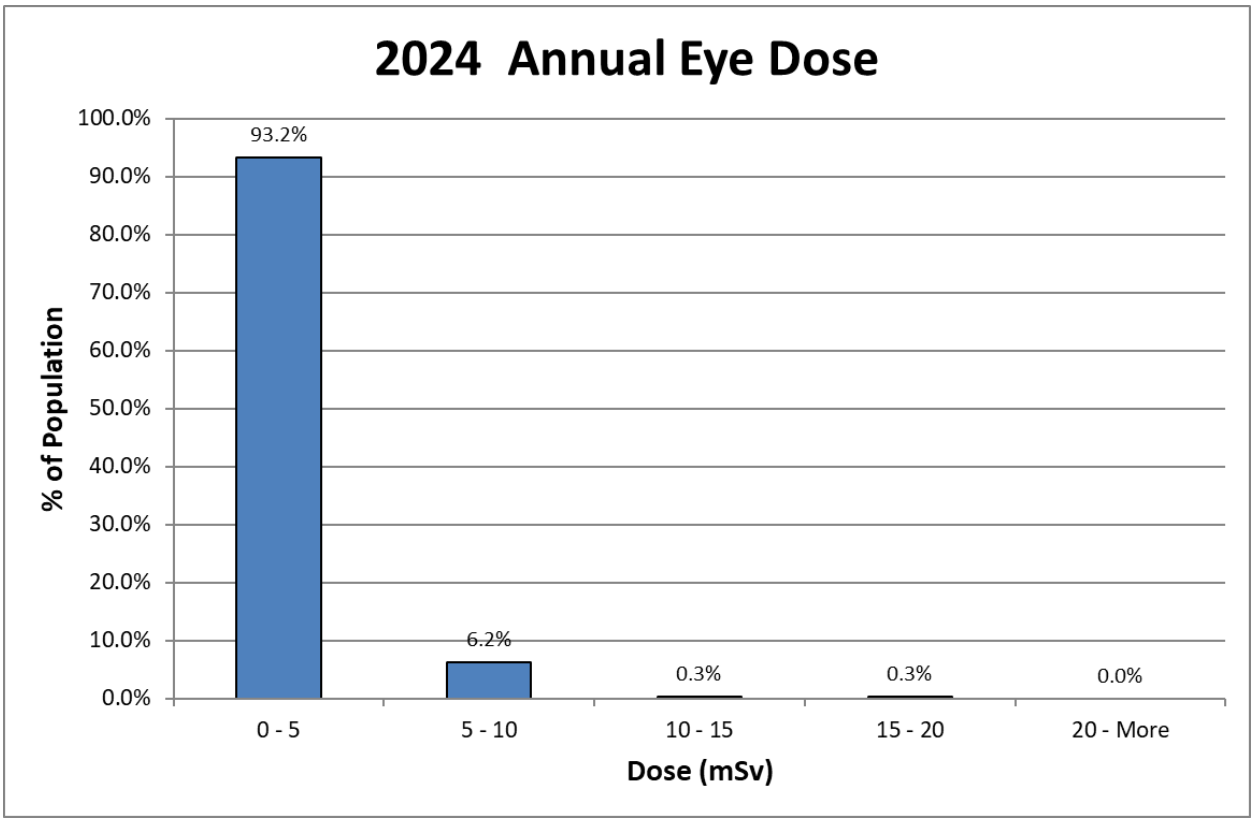
The CNSC regulatory dose limit to the lens of the eye for NEW's is 50 mSv per year. An interim monthly action level of 6 mSv per month, and an interim quarterly action level of 12 mSv per quarter is now in place for BRR. There is not yet a licensed dosimetry service for eye dose and eye dose is calculated from the worker OSLD.

Table 6 and Figure 7 display the distribution, in 5 mSv increments, of the calculated dose to the eye for all NEWs in 2024. The calculated eye dose for the majority of NEWs was below 5 mSv (93.2%) with no employees above 20 mSv.

Table 6

2024 Eye Dose Distribution	
Dose Range (mSv)	**Percentage of Individuals (%)**
0 – 5	93.2
5 – 10	6.2
10 – 15	0.3
15 – 20	0.3
> 20	0

Figure 7



The highest eye doses are from the operations work group, consisting of production and maintenance personnel. In 2024, the average eye dose for all NEWs was 1.0 mSv and the maximum annual eye dose was 17.7 mSv.

Changes to the *Radiation Protection Regulations* prompted BRR to initiate tracking and analysis of eye dose to employees and contractors in 2021.

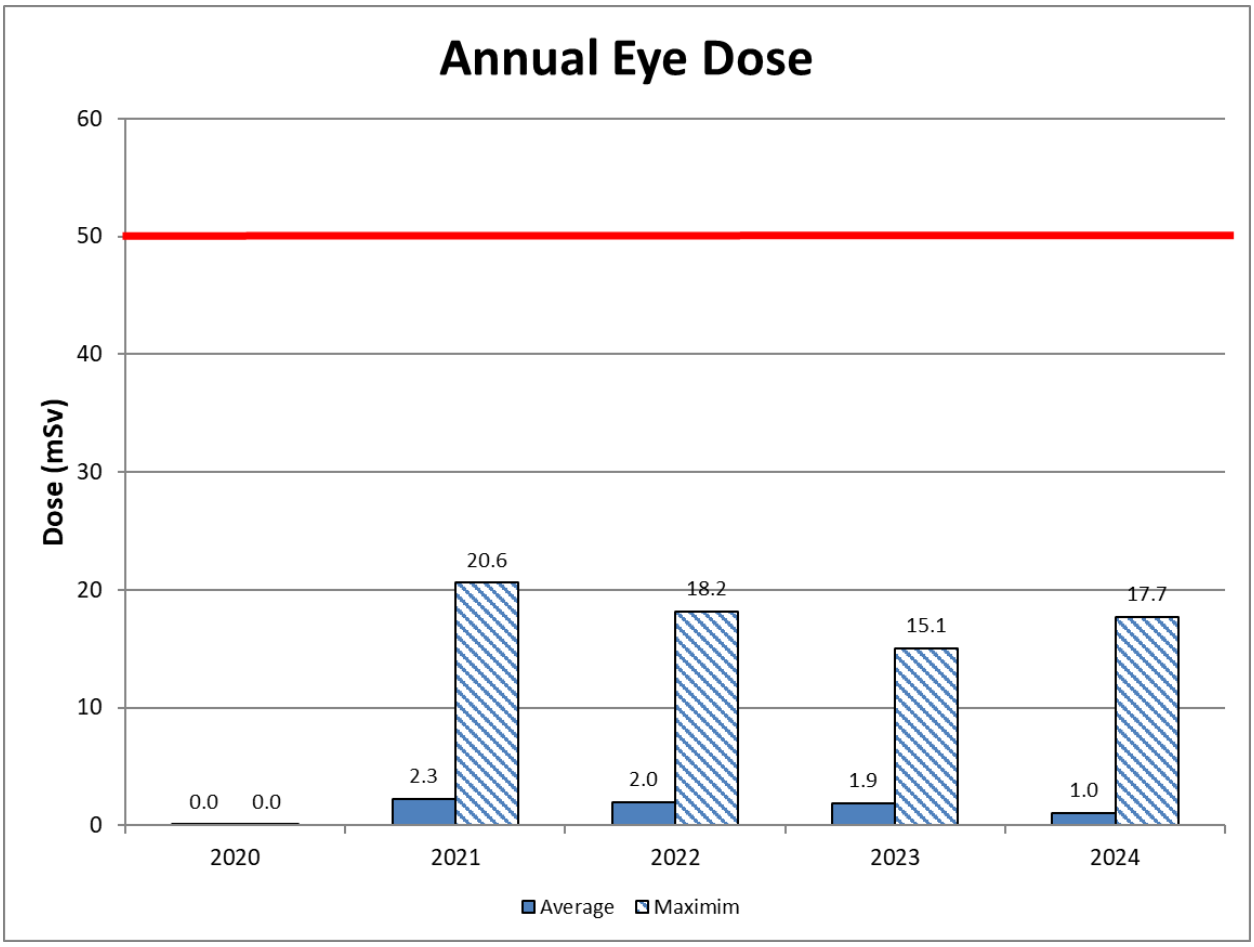
Table 7 and Figure 8 present the employee average, minimum and maximum eye dose for the 2021 - 2024 period. This table and figure will include year by year comparison in future reports as data is collected. Eye dose is currently being estimated from the OLSD results by the dosimetry service provider.

The chart illustrates that the maximum annual dose received by an individual is below the regulatory limit. In 2024, the individual with the highest eye dose was a process operator, this was the same operator who had the maximum skin dose.

Table 7

Eye Dose				
Year	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
2021	185	2.3	0.0	20.6
2022	207	2.0	0.0	18.2
2023	255	1.9	0.0	15.1
2024	385	1.0	0.0	17.7

Figure 8



Extremity Dose table

Process operators and certain maintenance workers have historically been issued ring dosimeters. These dosimeters are only required to be worn when working in the raffinate and DRaff areas of the refinery but may be worn in other areas of the refinery as well. Table 8 shows the average, minimum and maximum ring dosimeter result for employees over the last five years. The average extremity dose decreased in 2024 compared to 2023. The 2024 average result of 3.9 mSv is less than 1% of the CNSC regulatory limit of 500 mSv, and the maximum extremity dose of 29.5 mSv is approximately 5.9% of the CNSC regulatory limit of 500 mSv. The highest extremity dose was to a process operator. This was the same operator who had the maximum eye dose and skin dose.

Table 8

2020 – 2024 Extremity Dose				
Year	**Number of Individuals**	**Average**	**Minimum**	**Maximum**
2020	45	3.4	0	14.5
2021	59	5.2	0	27.2
2022	58	2.7	0	20.2
2023	51	4.3	0	26.6
2024	53	3.9	0	29.5

Urine Analysis

Table 9 shows the distribution of urine results for 2024. A total of 10,135 urine samples were collected and analyzed for uranium during 2024. The majority of uranium in urine results (97.8%) were less than 5 µg U/L in 2024.

Table 9

2024 Urine Analysis Results	
Distribution of Results	**2024**
Number of Samples ≤ 5 µg U/l	9916
Number of Samples >5 to ≤ 25 µg U/l	209
Number of Samples >25 to ≤ 50 µg U/l	10
Number of Samples > 50 µg U/l	0
Number of Uranium in Urine Samples Analyzed	10,135
Maximum Routine Sample Result (µg U/L)	12.4
Maximum Non-Routine Sample Result (µg U/L)	40.0

The distribution of 2024 internal urine dose for employees is shown in Table 10 and Figure 9. Approximately 75.6% of the individual assigned doses were below 0.2 mSv, which is significantly more than the 2023 statistic of 64.2%. Approximately 97.3% of the urine dose results were less than 1 mSv, which is similar to 2023. Cameco's Fuel Services Division has an Internal Dosimetry Licence (#11010-16-34.0) for both urinalysis and lung counting.

Table 10

2024 Internal Dose Distribution (Urine Analysis)	
Dose Range (mSv)	**Percentage of Individuals (%)**
0.0 – 0.2	75.6
0.2 – 0.4	7.1
0.4 – 0.6	4.1
0.6 – 0.8	7.9
0.8 – 1.0	2.6
> 1.0	2.6

Figure 9

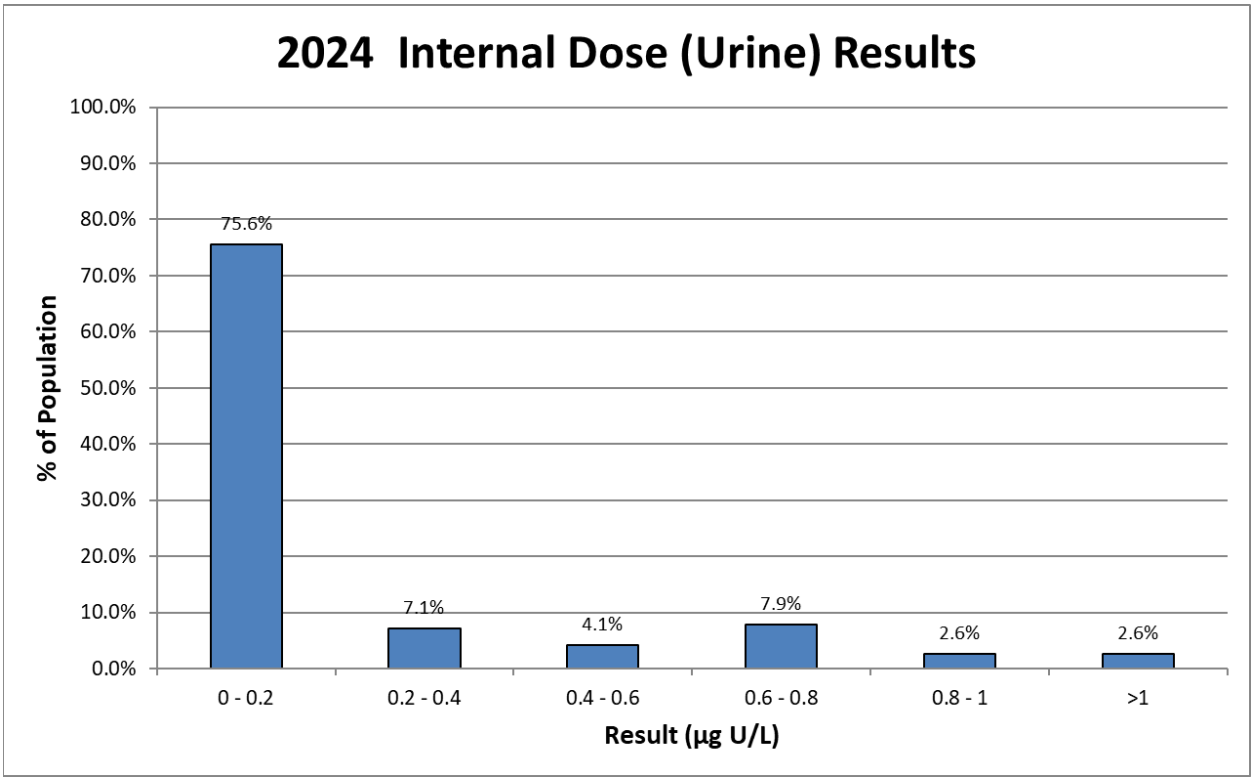


Table 11 and Figure 10 present the average and maximum internal urine analysis doses for the 2020 through 2024 period. A total of 266 employees and contractors were monitored by the urine analysis program during 2024. The average and maximum internal urine analysis doses in 2024 (including contractors) were 0.17 mSv and 1.74 mSv respectively which were comparable to previous years. The maximum dose of 1.74 mSv was received by a process operator.

Dose from urine analysis is part of the total effective dose.

Table 11

2020 – 2024 Internal Dose (Urine Analysis)				
Year	**Number of Individuals**	**Average Dose (mSv)**	**Minimum Dose (mSv)**	**Maximum Dose (mSv)**
2020	155	0.27	0.00	2.58
2021	154	0.21	0.00	1.92
2022	175	0.23	0.00	1.98
2023	165	0.27	0.00	1.70
2024	266	0.17	0.00	1.74

Figure 10

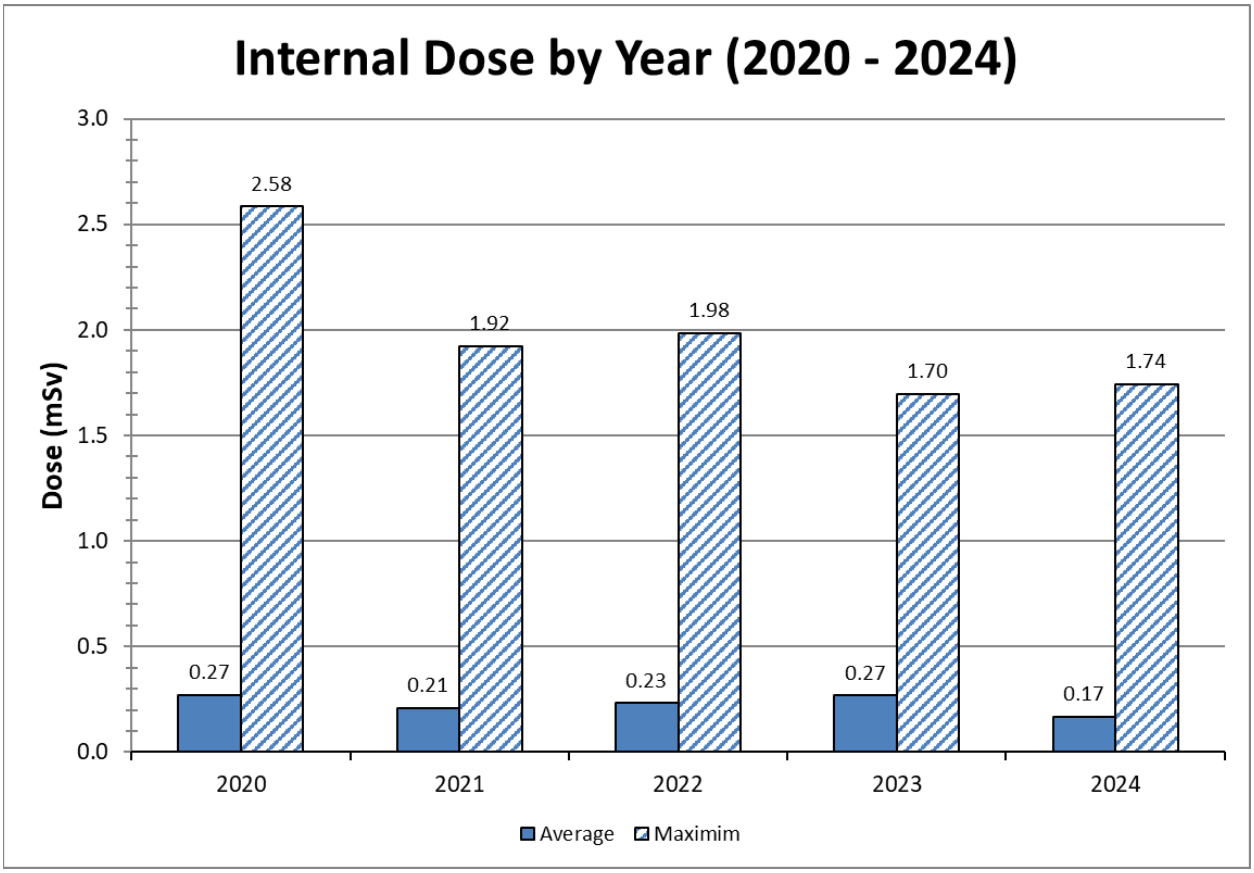


Table 12 shows a comparison of the annual exposure results for whole body dose, skin dose and urine analysis broken down by work group. The highest doses are from the operations work group, consisting of production and maintenance personnel.

Table 12

2024 Annual Exposure Results by Work Group									
Work Group	**Whole Body (mSv)**			**Skin Exposure (mSv)**			**Urine Analysis (mSv)**		
	Avg	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**
Administrative Support	0.25	0.00	2.69	0.40	0.00	2.67	0.01	0.00	0.28
NEW Contractors	0.07	0.00	1.64	0.26	0.00	3.11	0.02	0.00	0.29
Operations	1.31	0.00	6.49	6.70	0.02	38.89	0.42	0.00	1.74
Total	**1.63**	**0.00**	**10.82**	**7.36**	**0.02**	**44.67**	**0.45**	**0.00**	**2.31**

Lung Counting

As part of the licensed internal dosimetry program Cameco employs the use of a lung counter to monitor and assess exposure of uranium in the lungs of its employees and contractors (NEW) at BRR. This equipment is capable of measuring extremely low levels of contamination to the point where an employee's exposure could be stopped well before it could become an issue.

A total of 398 internal lung count doses were assigned at BRR in 2024. There were no investigations triggered by the lung counting program during the year and no regulatory action level was exceeded for lung count measurements. Intercomparisons (independent tests) were reinstituted by Health Canada in 2021 to validate, test, and certify the lung counting system.

The estimates of 2024 internal exposures, based on the lung counting program, were assigned for 118 employees and the prorated actuals of 2023 internal exposures were calculated for 280 contractors (NEW) and administrative employees. The 2024 average internal lung counting dose assigned was 0.5 mSv. The maximum dose of 3.0 mSv, received by an operations employee. Note that the action level is 5 mSv.

Table 13 and Figure 11 show the distribution of assigned lung counting doses. All assigned lung doses were below 5 mSv.

Table 13

2024 Internal Dose Distribution (Lung)	
Dose Range (mSv)	**Percentage of Individuals (%)**
0 – 1	78.1
1 – 2	14.3
2 – 3	7.3
3 – 4	0.3
4 – 5	0.0
> 5	0.0

Figure 11

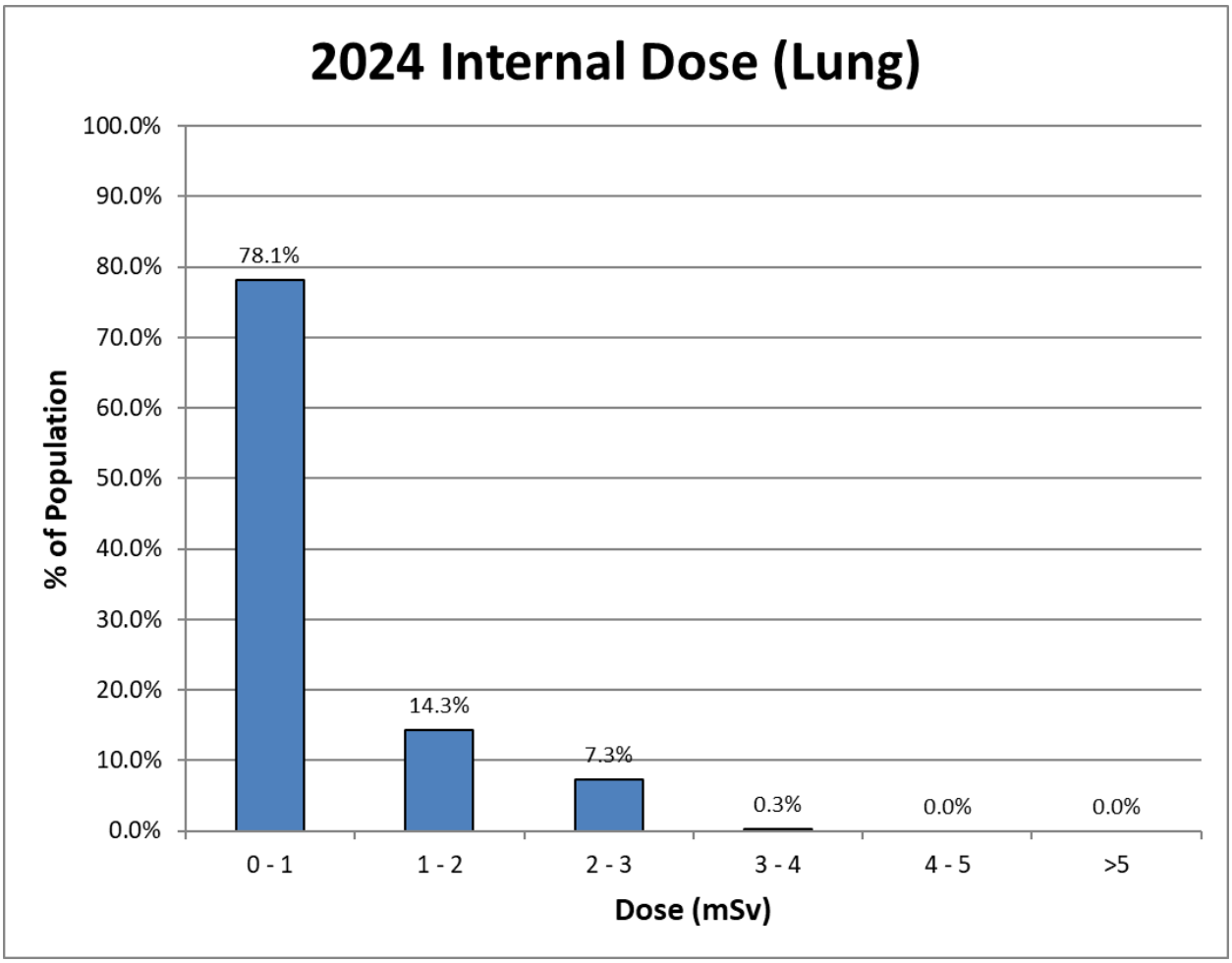


Table 14 and Figure 12 presents the internal lung counting dose data for 2020-2024 period.

Table 14

Internal Lung Count Exposures 2020 – 2024				
Year	**Number of Individuals**	**Average (mSv)**	**Minimum (mSv)**	**Maximum[1] (mSv)**
2020	167	1.2	0.0	4.0
2021	186	0.9	0.0	3.2
2022	209	0.6	0.0	2.7
2023	255	1.0	0.0	4.4
2024	398	0.5	0.0	3.0
[1]Maximum annual dose to an individual				

Figure 12

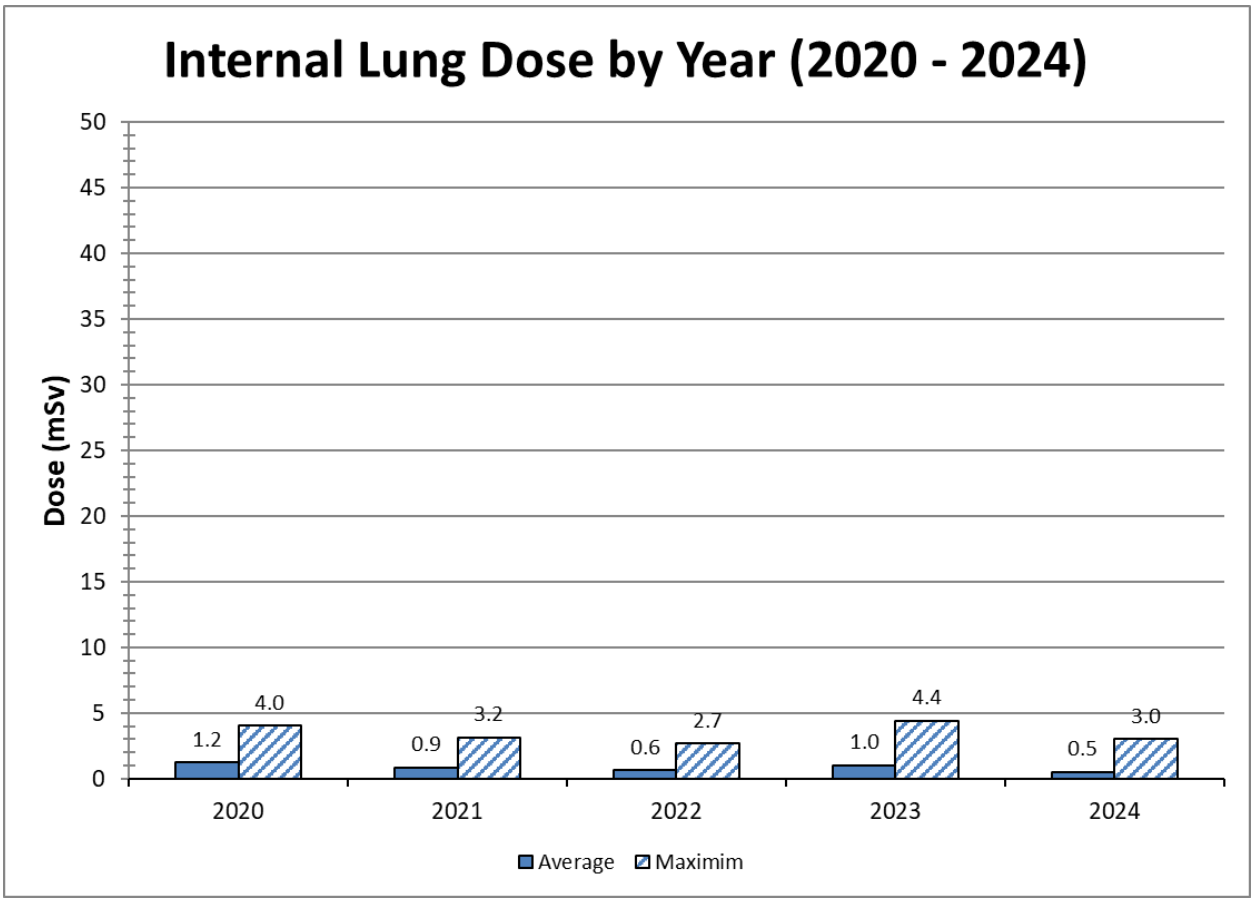


Table 15 shows the annual lung dose results for each of the three work groups. The highest dose is from the operations group.

Table 15

Assigned Internal Lung Count Doses 2024				
Dosimetry Group	**Number of Individuals**	**Average (mSv)**	**Minimum (mSv)**	**Maximum[1] (mSv)**
Administrative Support[2]	86	0.1	0.0	1.4
NEW Contractors[2]	208	0.3	0.0	2.3
Operations	104	1.2	0.0	3.0
Regulatory Limit - annual (5 years)		50 (100)		
[1]Maximum annual dose to an individual				
[2]Includes prorated doses				

In 2024, no lung count measurements exceeded the Decision Level (DL) of the lung counter; therefore, lung doses for all individuals were based and assigned on group averages. Differences in individual lung doses within the same group are due to different fractions of the group average being applied to the individual's annual dose, based on the dates the individual's lung counts occurred.

Differences in individual lung doses from year to year are due to correction factors. The current methodology assigns the dose from a lung count to the next lung count, hence the lung doses for 2024 are estimates only, projecting the exposure from the last lung count in 2024 until the end of the year to be the same as the one between the last two lung counts. Once the lung counts are completed in 2025, the actual lung doses for 2024 can be calculated. The difference between the actual and estimated lung doses is applied to the next year estimates (becoming corrected estimates).

Lung count is a component of total effective dose.

Total Effective Dose

The total effective dose (TED) was assessed for 400 employees and contractors. It should be noted that the internal lung dose component was assessed using the estimating function of the lung counting program management. The site average and maximum total effective dose for 2024 were 1.04 mSv and 8.60 mSv, respectively.

Table 16 and Figure 13 show the breakdown of the total effective dose for employees in 2024. 91.3% of employees or contractors (NEWs) had an effective dose of 4 mSv or less.

Table 16

2024 Total Effective Dose Distribution	
Dose Range (mSv)	**Percentage of Individuals (%)**
0 – 2	80.4
2 – 4	10.9
4 – 6	7.4
6 – 8	1.0
8 – 10	0.2
> 10	0.0

Figure 13

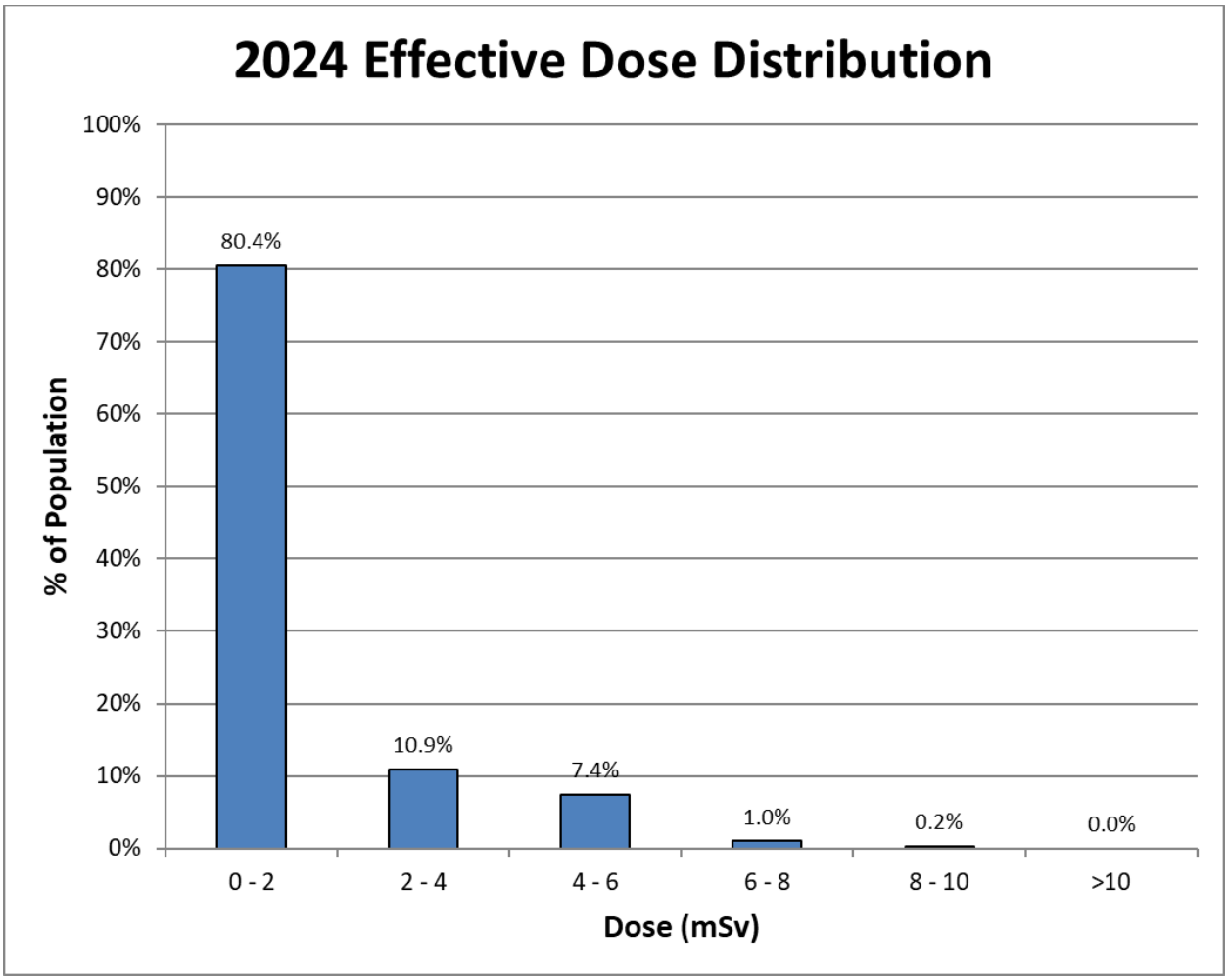


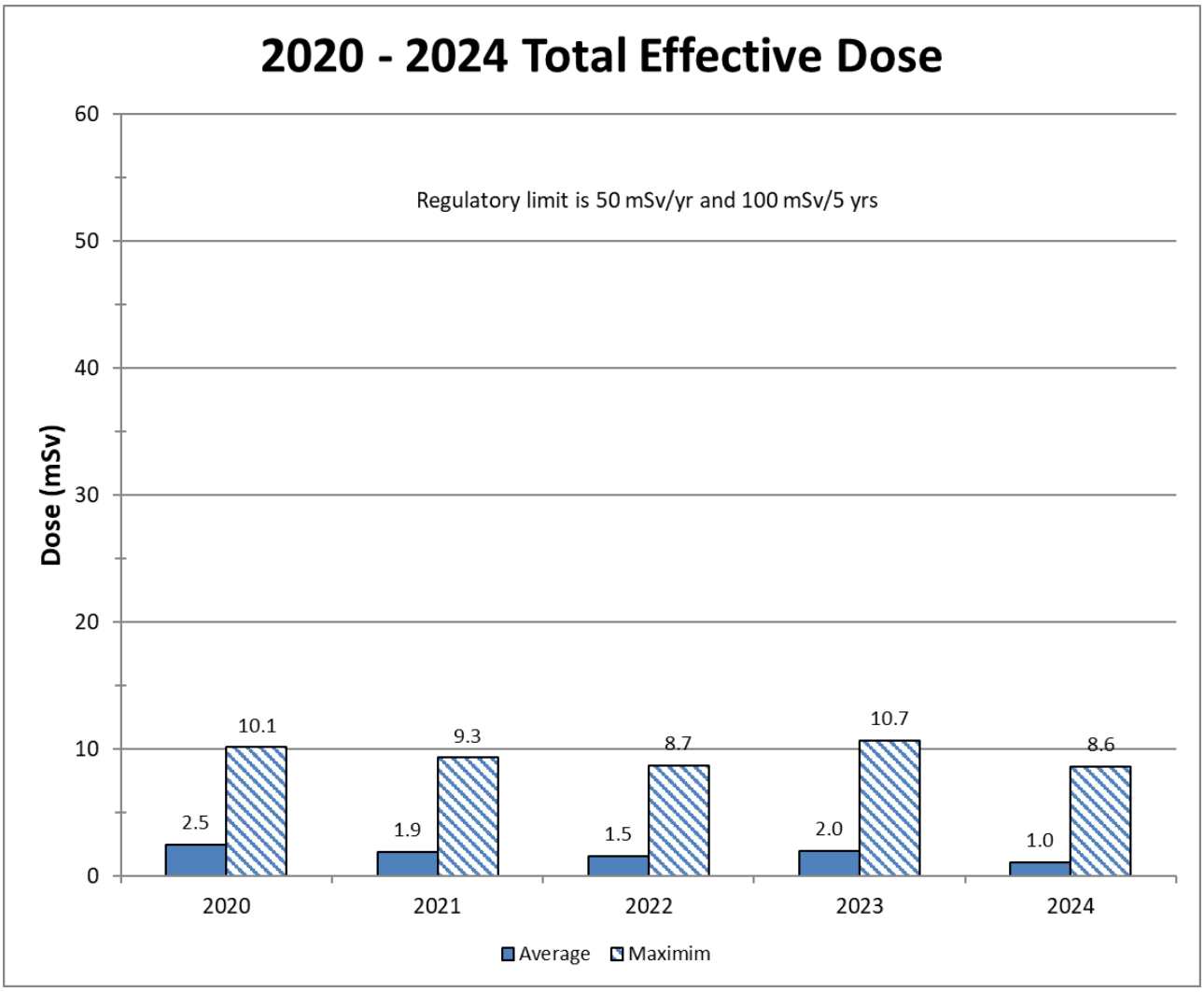
Table 17 and Figure 14 present the total effective dose for employees during the 2020 -2024 period. The average employee effective dose in 2024 is consistent with the average effective dose recorded over the past five-year period.

The five-year regulatory limits established in the *Radiation Protection Regulations* apply to unique five-year periods of time. The current period extends from January 1, 2021, to December 31, 2025. The maximum individual effective dose for the current five-year dosimetry period is 36.5 mSv which is well below the regulatory limits of 50 mSv/year and 100 mSv/5 years. The average total effective dose five-year trend from 2020 through to the end of 2024, remains stable, with a maximum average of 2.5 mSv in 2020 and a minimum average of 1.0 mSv in 2024.

Table 17

Total Effective Dose 2020 - 2024				
Year	**Number of Individuals**	**Average (mSv)**	**Minimum (mSv)**	**Maximum[1] (mSv)**
2020	169	2.5	0.0	10.1
2021	186	1.9	0.0	9.3
2022	210	1.5	0.0	8.7
2023	255	2.0	0.0	10.7
2024	400	1.0	0.0	8.6
[1]Maximum annual dose to an individual				

Figure 14



Cameco measures and assigns dose to all workers with a potential to receive dose and designates workers as NEWs on this potential. Average results are reported using an assignment of a zero dose when the dose was too small to be measured. A measured dose of zero is a legitimate dose and reflects the radiation exposure controls in place at the facility.

Table 18 shows the annual NEW total effective dose results for measurable doses (removal of zero doses). The average total effective dose for all measurable doses (zero doses removed) for a NEW in 2024 was 1.05 mSv.

Table 18

Total Effective Dose (All Measurable Doses – Zero Dose Removed)				
Year	**Number of Individuals**	**Average[2] (mSv)**	**Minimum (mSv)**	**Maximum[1] (mSv)**
2020	89	1.3	0.1	10.1
2021	181	3.73	0.03	9.31
2022	200	1.62	0.01	8.69
2023	254	1.96	<0.01	10.67
2024	400	1.05	<0.01	8.60

[1]Maximum annual dose to an individual
[2]BRR began reporting non-zero average total effective dose in 2020

Table 19 shows the total effective dose broken down into urine analysis dose, lung count dose and external whole-body dose for 2024 (zero doses included).

Table 19

Dose Components & Total Effective Dose 2024												
Dosimetry Group	**Urine Analysis Dose (mSv)**			**Lung Counting Dose[1] (mSv)**			**External Whole-Body Dose (mSv)**			**Total Effective Dose (mSv)**		
	Avg	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**
Administrative support	0.01	0.00	0.28	0.1	0.0	1.4	0.25	0	2.69	0.31	0.00	3.01
NEW Contractors	0.02	0.00	0.29	0.3	0.0	2.3	0.07	0	1.64	0.40	0.00	2.58
Operations	0.42	0.00	1.74	1.2	0.0	3.0	1.31	0	6.49	2.96	0.00	8.60
BRR Average	**0.17**	**0.00**	**0.84**	**0.51**	**0.0**	**2.3**	**0.45**	**0**	**3.18**	**1.04**	**0.00**	**4.21**

[1]Based on estimated individual lung doses

Doses assigned by the urine analysis program continue to be minimal. All lung doses were assigned using a group average method. As with the previous year's data, the group averages for external whole-body dose are low compared to maximally exposed individuals. This indicates that workplace controls are adequately controlling exposure for the group as a whole but the actions of specific employees are causing those individuals to receive unnecessary dose.

As indicated in Table 20, the individuals with the highest effective doses at BRR include process and S&FP operators.

Table 20

2024 Five Highest Effective Dose Individuals				
Occupation	**Urine Dose (mSv)**	**Lung Dose (mSv)**	**External Whole-Body Dose (mSv)**	**Effective Dose (mSv)**
S&FP	0.75	1.36	6.49	7.24
S&FP	0.90	1.31	5.78	6.68
S&FP	0.63	0.67	5.94	6.57
S&FP	0.31	1.41	5.08	5.39
Process	0.80	1.25	4.51	5.31

Collective dose for each dose component with all assigned doses is provided in Table 21 for 2020 through 2024.

Table 21

Collective Dose						
Year	**Whole Body (mSv)**	**Skin (mSv)**	**Extremity (mSv)**	**Urine Dose (mSv)**	**Lung Dose (mSv)**	**Effective Dose (mSv)**
2020	174.3	857.1	153.8	41.9	203.6	419.8
2021	157.3	828.4	309.0	31.8	159.4	348.6
2022	148.9	793.7	159.0	40.5	133.8	323.1
2023	189.7	941.0	216.8	44.4	264.8	498.9
2024	172.0	780.1	205.5	44.6	202.2	418.8

Contamination Control

An extensive contamination control program is in place at the refinery. The refinery is divided into three zones for contamination control purposes. Zone 1 areas are designated as clean areas, with no dispersible radioactive material allowed, while Zone 3 areas are production areas. Zone 2 areas are zones where small amount of radioactive material may be present. Routine contamination monitoring is done in Zone 1 and 2 areas, with a focus on employee lunchrooms, change rooms and hallways. Table 22 summarizes 2024 alpha monitoring results from both areas and includes both swipe samples and direct contact surface measurements. There were thirty-five results above the internal administration level (IAL) in 2024, compared to forty-three results above the IAL in 2023. For any results over the IAL, the affected area is cleaned and re-monitored to verify the contamination has been removed. Contamination readings above the IAL pose no significant risk to people or to the environment. The number of contamination events in 2024 was attributed to responsive maintenance activities in the refinery.

Table 22

2024 Alpha Contamination Monitoring Results		
Area	**Total Number of Measurements**	**Number of Readings Above IAL**
Zone 1	1416	0
Zone 2	27621	35
Internal Administrative Level (IAL) for swipes is 0.15 Bq/cm^2 and for direct contact readings is 0.37 Bq/cm^2.		

All plant clothing is laundered on site and clothing and work boots are routinely monitored for contamination; with items contaminated above administrative levels disposed of via the on-site incinerator. There were no contamination issues identified related to vehicles leaving the refinery.

Three whole body monitors are in routine service at the front entrance to the facility. All employees and visitors are required to pass through a whole-body monitor prior to exiting the refinery. Any contamination issues identified are addressed promptly prior to individuals leaving site.

In-plant Air

A summary of in-plant air sampling results for 2024 is provided in Table 23 and Table 24. Approximately 0.2% of the samples were above the uranium-in-air respirator level (RL). There were 29 samples above the RL in 2024 compared to 59 samples above in 2023. Average results for the plant areas identified in the table were similar to the 2023 area average results, with the average result being 3 µg U/m^3, or approximately 3% of the RL. The highest result for the year was from the denitration area. The number of RL samples are attributable to the responsive maintenance activities throughout the refinery, in particular in the denitration and draff areas. Through the use of respiratory protection, there were no significant worker doses as a result of the increased number of RL events.

Table 23

Location	# Samples	Average (ug/m^3)	Max (ug/m^3)	# of Samples Above RL
Aisle to Powerhouse	12	1	2	0
Boildown	85	1	14	0
Calcination	2196	5	185	5
Control Room	2	0	0	0
Digestion	377	2	42	0
Draff/Raffinate	3634	0	21	0
Equipment Decontamination	411	1	26	0
Gravimetric Feeder	366	7	305	5
Main Aisle	12	3	9	0
MAINT. SHOP	12	1	3	0
Solvent Extraction	12	0	0	0
Sump Treatment	362	3	29	0
U CONC Lab	12	0	1	0
UO3 Lab	12	0	0	0
Warehouse	2609	2	117	1
Denitration	2197	7	630	18
Grand Total	**12311**	**3**	**630**	**29**
Respirator Level (RL) is 90 µg/m^3				

As shown in Table 24, there were a total of 1637 samples from the raffinate/DRaff area analyzed for thorium-in-air in 2024. Approximately 1% of the samples analyzed for thorium-in-air were above the thorium-in-air RL, down from the 9% in 2023. The number of RL samples decreased to 29 in 2024 compared to 180 in 2023.

Table 24

2024 Thorium-in-Air Sampling Results			
# of Samples[1]	Average Th-230 (Bq/m^3)	Maximum Th-230(Bq/m^3)	# of Samples
1637	0.01	1.3	22
[1]Respirator Level (RL) is 0.15 Bq/m^3 Th-230			

The decrease in RL samples is attributed to greater precautions being made to prevent dusting during maintenance activities throughout the refinery, in particular in the denitration and draff

areas. Through the use of respiratory protection, there were no significant worker doses as a result of the increased number of RL events.

Gamma Surveys

Plant gamma surveys using hand-held meters are done on a routine basis throughout the refinery. The frequency of the readings and the number of readings taken in each area varies based on the area of the refinery and the historical results from that area. Measurement frequencies can vary from monthly to semi-annually. Table 25 summarizes the results from general area readings taken in 2024. The results indicate that the raffinate/DRaff area has the highest gamma fields of all refinery areas. The 2024 average results in raffinate/Draff are similar to 2023. The maximum reading of 409 uSv/h is higher than in 2023. This is due to differences in the location where the reading was taken. Signage is posted at areas or locations where there is a reasonable probability that a person may be exposed to a dose rate greater than 25 µSv/h.

Table 25

2024 Summary of Plant Gamma Readings by Area (µS/h)			
Location	**Average**	**Maximum**	**Range**
UOC Warehouse	21.2	53.7	7.81 - 53.7
UOC Sub-sampling Lab	8.03	14.9	1.30 - 14.9
Calcination Area	8.30	29.4	0.58 - 29.4
Digestion	2.81	8.28	0.96 - 8.28
Solvent Extraction	0.72	1.27	0.32 - 1.27
UO_3 Sub-sampling Lab	4.08	6.26	3.04 - 6.26
Scrap Recovery	1.36	1.45	1.30 - 1.45
Raffinate/Draff	76.1	409	0.58 - 409
Boildown	0.76	1.96	0.40 - 1.96
Equipment Decontamination	10.1	32.0	1.4 - 32.0
Sump Treatment	1.39	1.93	0.85 - 1.93
Denitration	2.88	22.2	0.83 - 22.2
Nitric Acid Recovery	2.94	6.20	0.27 - 6.20

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on a review of radiological dose and monitoring data and results from completion of annual self-assessment checklists.

2.3.2 Conventional Health and Safety

This safety and control area covers the implementation of a program to manage conventional workplace health and 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 BRR. The foundation of the program is based on the *Nuclear Safety and Control Act* and its regulations as well as Part II of the Canada Labour Code. The regulations made pursuant to the *Nuclear Safety and Control Act* and the Canada Labour Code prescribe specific health and safety requirements that are met by the BRR.

Non-radiological safety hazards are managed through a comprehensive Occupational Health and Safety program as prescribed by the Cameco Health and Safety Management Program. This program set out the requirements for management of health and safety aspects of the operation consistent with Cameco's corporate SHEQ policy. 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.

The BRR site program undergoes several review processes, including scheduled procedure reviews, program audits, and annual management review. Conformance to the program is also tested through various inspection programs, incident investigations, and ongoing analysis by the joint workplace committees.

The health and safety management program fosters and promotes a strong sustainable safety culture. Cameco has five key principles related to safety that form the framework for 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 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. There is a site joint workplace health and safety committee, known as the Facility Health and Safety Committee (FHSC), which meets monthly to discuss safety-related issues. Committee members also participate in site FHSC inspections which are carried out on a weekly basis during operations. A schedule is followed to ensure the entire facility is inspected annually. Inspection results are distributed and published and are also entered into the CIRS database for recording and tracking purposes. Departmental inspections are also conducted monthly. A total of 23 FHSC inspections were conducted in 2024, along with 128 department inspections.

BRR 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 refinery. Table 26 presents the safety statistics for the refinery over the last five years.

Table 26

2020 – 2024 Safety Statistics					
Year / Parameter	**2020**	**2021**	**2022**	**2023**	**2024**
First Aid Injuries	14	8	15	23	27
Medical Diagnostic Procedures	2	5	10	5	3
Medical Treatment Injuries	2	1	1	3	3
Lost Time Injuries	0	0	0	1	0
Lost Time Injury Frequency	0	0	0	0.69	0
Lost Time Injury Severity	0	0	0	2.08	0
Site TRIR	1.61	0.76	2.37	2.78	1.76

All reported Occupational Health and Safety incidents are documented in CIRS for tracking and management. The CIRS system defines five significance levels of incidents based on actual and potential outcome, with Significance Level I incidents being minor and Significance Level V incidents having the highest actual and potential consequences. A significance rating system is built into the CIRS database and used to assess all events and near misses. There were no level IV or V health safety related events.

There were three injuries reportable to the Employment and Social Development Canada (ESDC) in 2024, compared to four reportable in 2023. Two of the reportable injuries were due to placement of the affected employees on restricted duties on a short-term basis, the third was due to a lost time injury.

BRR's total recordable injury rate (TRIR) at the end of 2024 was 1.76 due to the restricted duties and another medical treatment from a slip/fall in the yard. This was a decrease from 2024 TRIR of 2.78.

The refinery has an effective orientation program for contractors, utilizing health and safety orientation handbooks and classroom training.

BRR has a safety charter (the Charter) in place detailing our employee's 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 refinery entrance.

Several activities to improve occupational health and safety were undertaken in 2024, including the following:

- Four site safety promotions for ergonomics, safety charter review, fire safety, and caught working safely.
- Implemented 1 proactive safety improvement
- 435 STOP (self-check) observations were completed
- 50 safety suggestions were received from employees

The 2024 objectives related to ergonomic assessments and rolling out the self-check program were completed.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on a review of health safety statistics and results from completion of annual self-assessment checklists.

2.3.3 Environmental Protection

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

There are both federal and provincial regulatory authorities that have legislative jurisdiction over environmental protection at the facility. Cameco monitors air and liquid effluent discharges from BRR to ensure that they meet applicable provincial and federal requirements.

The refinery's Environmental Protection Program (EPP) is comprised of the following components:

- sampling of water and air emissions
- high-volume air sampling of ambient air
- additional ambient sampling, including soil, surface water and groundwater monitoring

For key emission parameters, Cameco has established action levels that may be indicative of a potential loss of control for that specific parameter. As noted previously, these action levels serve as an early warning of a condition that warrants further investigation. Action levels are accepted by CNSC staff. In addition, as a continual improvement tool, Cameco has established lower-tier internal administrative levels, which are set below the action levels and provide very early warning of a potential concern. A result above an internal action level is also investigated and remedial actions taken if necessary.

The key characteristics of the operation and activities that can have a significant environmental impact are monitored and measured and are described in the EPP and associated procedures. These documents identify the emissions to the air, water and land, the programs that are in place to monitor them, what is measured, the legal requirements and the reporting requirements. Four environmental related documents were updated in 2024.

Environmental objectives and targets are established jointly by the site management team and site specialists, to ensure there is agreement, commitment and awareness of these objectives and targets across all areas of the refinery's operation. These objectives and targets can address, among other things, planned environmental improvements or enhancements in the field, purchase of new monitoring equipment and procedural and data management improvements. The status of these objectives and targets is reviewed by the site management team and resources are allocated as required to achieve the targets. Update reports on the objectives and targets are posted on the EMS bulletin board bulletin board outside the employee change rooms so that employees can monitor their progress.

New environmental objectives were established at the start of 2024. The objectives were: continue waste management initiatives to reduce the inventory of contaminated combustible material (CCM) and accumulated packaged waste. Storm water management, a study was completed to ensure all rainwater and snow melt could be contained in our storm water lagoon These activities were completed in 2024.

As part of the joint workplace health and safety committee, updates on the status of the environmental protection program at the refinery are discussed at the monthly meetings and employees are encouraged to bring any questions or concerns forward.

Any issues identified during either regulatory or internal audits are documented in the CIRS database so that corrective actions can be identified and implemented.

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 due to release of the radionuclide to air or surface water during normal operation of a nuclear facility over the period of a calendar year.

The DRL for the facility is based on three components: dose to the public from air emissions, dose from water discharges and dose from gamma radiation. For the refinery, dose to the public from air and water emissions is a very small fraction of the public dose limit. In 2024 the dose to the public from air emission was <0.00001 mSv and the dose to the public from water emissions was <0.00001 mSv. The dose to the public from gamma emissions was 0.009 mSv. Therefore, the gamma component represents virtually all the estimated public dose. A more detailed explanation of the determination of the DRL can be found in the report, Derived Release Limits for Cameco's Blind River Facility, dated August 2018. The increase in the gamma component of the DRL in 2020 is a result of utilizing the new DRL calculation and is not attributable to any operational changes or increase in refinery emissions.

The critical receptor is the hi-vol station at the golf course. An environmental dosimeter is placed at the hi-vol station and changed out on a quarterly basis. Quarterly results are shown in Table 27 below. In 2024, the estimated dose to the public based on results from the dosimeters located at the golf course hi-vol station is 0.9% of the public dose limit, or 0.009 mSv.

Table 27

Golf Course Hi-Vol Dosimeter Results for 2024		
Quarter	Result[1] (mSv)	Background Corrected Result[2]
First Quarter	0.03	0
Second Quarter	0.04	0
Third Quarter	0.04	0
Fourth Quarter	0.05	0

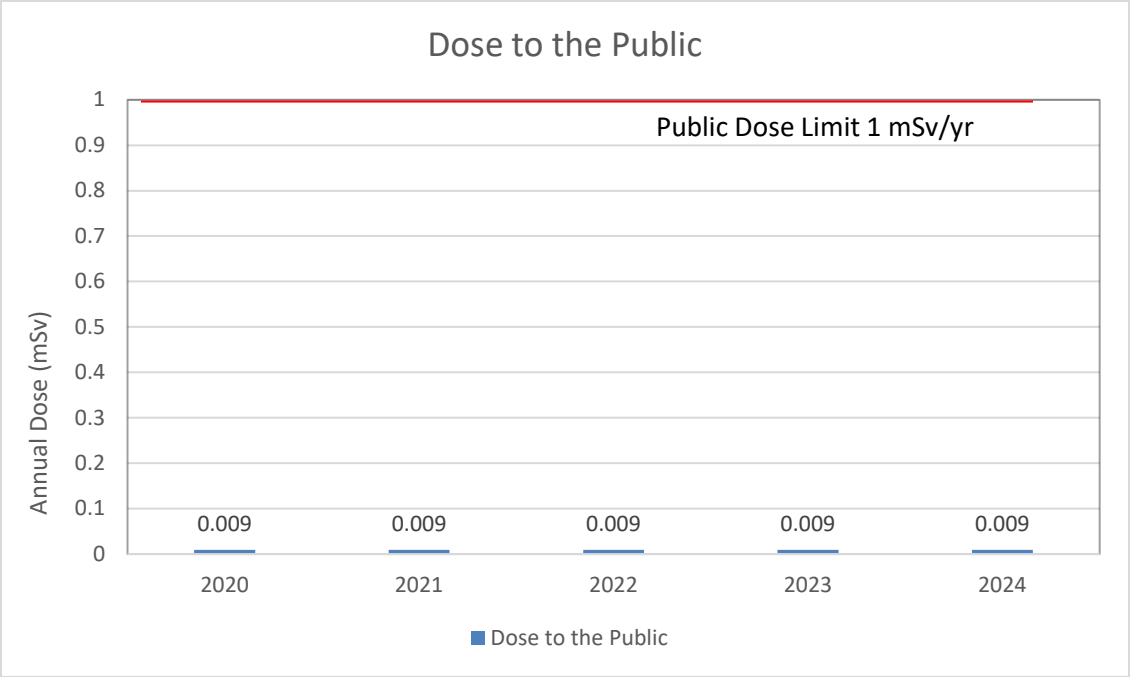
[1]As reported from the service provider
[2]Corrected for environmental background (0.11 µSv/h)

The annual estimated dose to the public for the 2020 – 2024 periods is shown in Table 28 and Figure 15. The annual estimated dose in 2022 is 0.009 mSv.

Table 28

Dose to the Public (mSv)						
Dose (mSv)	Regulatory Limit	2020	2021	2022	2023	2024
Critical Receptor	1 mSv/yr	0.009	0.009	0.009	0.009	0.009

Figure 15



Gamma Monitoring

Environmental dosimeters are also being placed along each of the four-perimeter fence lines; north, south, east and west. The perimeter fence line surrounds the refinery and defines the

boundary of the CNSC licensed facility. The dosimeters are collected and replaced in the field monthly. Results from the fence line dosimeters are being reported in the CNSC quarterly reports.

Gamma levels along the fence line can vary as the inventory of uranium materials in the yard area does change through the course of a year based on concentrate receipts, production requirements and shipping schedules. Table 29 summarizes the 2024 results from each fence line.

Table 29

2024 Measured Fence Line Gamma Levels (µSv/h)			
Fence Line	Annual Monthly Average Result	Annual Monthly Maximum Result	Range
East	2.15	3.21	0.49 - 3.21
North	0.04	0.06	0 – 0.06
South	0.95	1.58	0.78 - 1.58
West	1.02	1.20	0.85 - 1.20
Results in this table have been corrected for environmental background (11 µSv/h)			

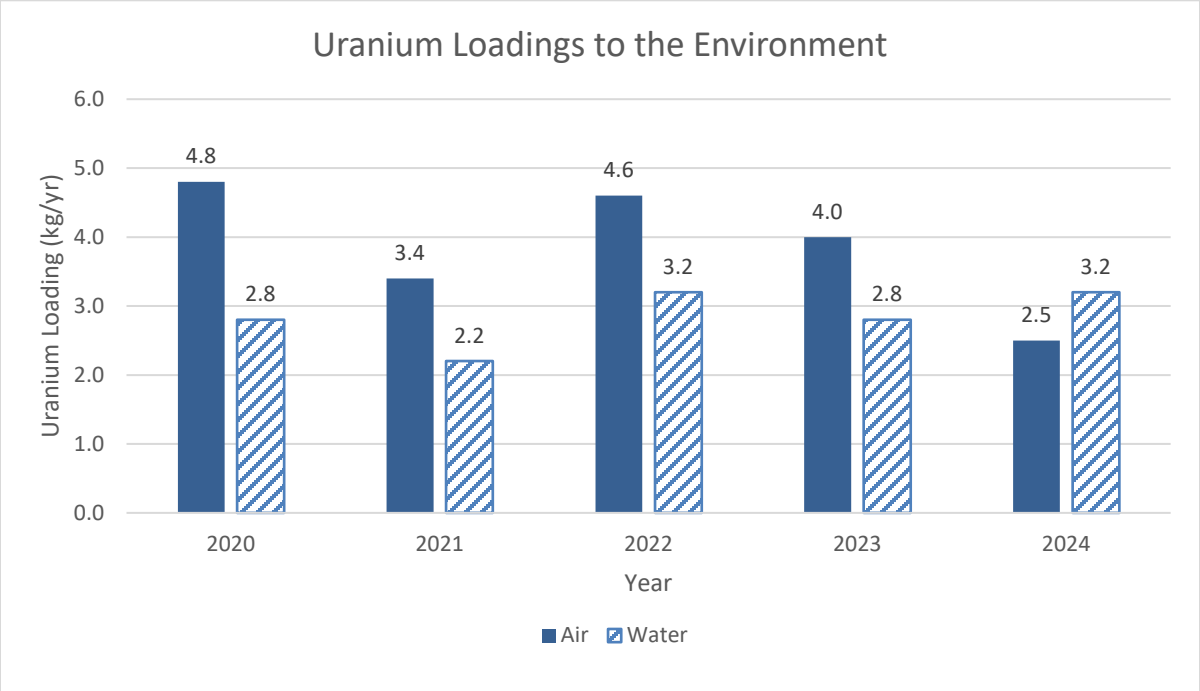
A CNSC action level of 0.25 µSv/h is currently in effect at the north fence only. North fence results in 2024 were below this action level value. On average results along all fence lines were similar to 2023 results.

Despite the fact that environmental dosimeters are now being used along the fence line, the critical receptor for the gamma component of dose to the public remains the hi-vol station at the neighboring golf course; as the land immediately outside the perimeter fence continues to be owned and controlled by Cameco. The golf course is the closest location where members of the public can reasonably be expected to be in proximity to the refinery for any significant period of time.

Uranium Loadings

Total uranium releases to the environment are shown in Table 30. Total uranium emissions decreased in 2024 compared to 2023. Emissions to air represent a combination of uranium loadings from the two process stacks and the incinerator stack, as determined from the routine stack sampling program, and uranium loadings from the various process area ventilation exhaust systems, as determined by in-plant air sampling data and exhaust discharge rates. The largest contributor to the increase in air emissions is due to an increase in the process area ventilation exhaust systems, which is likely due the increase in uranium ore concentrate sampling. Emissions to water remained consistent with previous years.

Figure 16



Air Emissions

The refinery has two process stacks and an incinerator stack that are routinely monitored for uranium and particulate emissions. TSI samplers are used in the stack for the measurement of uranium and total particulate. These isokinetic dust samplers use electrostatic precipitation to collect a sample from the stack gas stream. The absorber stack also has an on-line NOx analyzer. Each process area also has its own separate ventilation system. Uranium emissions from each of the individual process area ventilation systems are determined through calculation and have been verified in the past by third-party sampling of some of the ventilation systems. A variety of pollution control equipment including bag houses, scrubbers and activated carbon beds are used at the facility to control and reduce emissions to air.

There were no exceedances of CNSC regulatory limits or action levels with respect to air emissions in 2024. As indicated in Table 31 stack emissions for the key regulatory parameters remain low and well below CNSC licensed limits. Results are reported as the annual average of the daily or weekly results (parameter dependent) and the maximum daily or weekly value.

Table 30

Source	Parameter	Licence Limit	Action Level	Value	2020	2021	2022	2023	2024
DCEV	Uranium g U/h	93[1]	1.1	Annual Weekly Average	0.06	0.08	0.08	0.11	0.08
				Annual Weekly Maximum	0.11	0.14	0.24	0.36	0.15
Absorber	Uranium g U/h	21[1]	0.65	Annual Weekly Average	0.01	0.01	0.01	0.01	0.01
				Annual Weekly Maximum	0.02	0.02	0.04	0.04	0.02
	Nitrogen Oxides kg NO_2/h	19[2]	12	Annual Weekly Average	3.2	2.9	2.9	3.4	2.9
				Annual Weekly Maximum	5.4	4.8	4.3	4.4	4.6
Incinerator	Uranium g U/h	29[1]	N/A	Annual Weekly Average	<0.01	<0.01	<0.01	0.01	<0.01
				Annual Weekly Maximum	0.01	0.01	<0.01	0.02	<0.01
All Stacks	Particulate g/h	15,000[2]	N/A	Annual Weekly Average	10	10	10	10	10
				Annual Weekly Maximum	17	17	18	20	20

Results less than the detection limit are denoted as "<"
[1]Limit based on Annual Averaging
[2]Limit based on Daily Averaging

In addition to BRR's routine monitoring, stack sampling for uranium and other parameters of interest from the process stacks was also completed in 2024 by an independent third-party. Stack sampling of the incinerator was also carried out by an independent third-party to demonstrate that emissions from the incinerator meet provincial MECP limits as specified in the Environmental Compliance Approval (ECA) for the incinerator. Copies of the annual stack testing reports are required to be submitted to the provincial MECP. Copies of the reports are also provided to CNSC staff.

Results from annual testing are shown in Table 32. Results from most parameters are generally comparable to previous levels. Year-to-year results for the other parameters are not indicating any adverse trends, with all results well below their respective limits.

Table 31

Incinerator Stack Sampling Results for Air Pollution Control Circuit (APC)						
Parameter	**2020**	**2021**	**2022**	**2023**	**2024**	**% of Limit (2024)**
Total Suspended Particulate (mg/s)	1.71	0.56	1.01	1.30	1.54	12.5[1]
Uranium (mg/s)	0.001	<0.001	0.001	0.001	<0.001	<1[2]
NOx as NO_2 (mg/s)	78	96	70	81	48	32[1]
Mercury (µg/s)	0.28	0.27	0.29	0.24	0.21	<1.5[1]
Cadmium (µg/s)	1.09	0.13	0.21	0.14	0.55	5.4[1]
Lead (µg/s)	0.94	0.85	1.8	0.61	1.49	<1.5[1]
Dioxins & Furans (pg I-TEQ/Rm^3)	9	10.2	14.4	49.4	30.8	38[1]
HCl (mg/s)	<0.58	<0.47	<0.61	<1.21	<1.22	<1.0[1]
HF (mg/s)	<0.40	<0.32	0.42	<1.21	<0.19	<3[3]
SO_2 (mg/s)	<7.8	<7.83	<7.6	<7.2	9.0	23[1]

[1]Limit as indicated in MOECC Amended Environmental Compliance Approval 7751-6PUNQV.
[2]Limit as per Appendix A of CNSC license FFOL-3632.00/2032
[3]% of POI allowable limit as per O. Reg 419

Water Discharges

The refinery has one liquid effluent discharge location into Lake Huron. All liquid effluent is sampled and analyzed prior to discharge to ensure all federal and provincial regulatory discharge parameters are met. An effluent treatment circuit and supplementary pollution control equipment are installed in the UO_3 plant to control and reduce emissions to water.

As indicated in Table 33, concentrations of key parameters in liquid effluent emissions remain well below regulatory limits. In addition, there were also no action level exceedances in 2024. Data for uranium, nitrate and radium-226 is reported as the monthly average of weekly composite results, while limits for pH are based on individual daily discharges. Results are comparable to previous years.

Effluent parameters are analyzed either in-house, using conventional and appropriate analytical instrumentation or completed by a qualified third-party contract laboratory.

Table 32

Liquid Effluent Discharges								
Parameter	**Units of Measure**	**CNSC Licensed Limit**	**Value**	**2020**	**2021**	**2022**	**2023**	**2024**
Uranium	**mg/L**	**1.7**	Monthly Average	0.01	0.01	0.02	0.01	**0.02**
			Monthly Max	0.02	0.03	0.04	0.03	**0.03**
Nitrate	**mg/L as N**	**N/A**	Monthly Average	19	18	22	7.4	**6.0**
			Monthly Max	26	39	57	37	**18.0**
Radium-226	**Bq/L**	**N/A**	Monthly Average	0.01	<0.01	<0.01	0.0	**0.01**
			Monthly Max	0.01	0.01	0.1	0.02	**0.01**
pH	**-**	**Min 6.0**	Daily Min.	7.0	7.3	7.0	7.1	**7.8**
		Max 9.5	Daily Max.	8.4	8.4	8.4	8.6	**8.1**

There were 98 individual daily lake discharges in 2024. The month with the monthly maximum number of discharge samples was October with 13 days. Monthly loadings for the licensed liquid effluent parameters uranium, nitrate and radium-226 are shown in Table 34.

Table 33

2024 Liquid Effluent Loadings			
Month	**Uranium (kg)**	**Nitrate (as N) (kg)**	**Radium-226 (Bq)**
January	0.34	175	92465
February	0.24	155	87115
March	0.41	93	93210
April	0.25	61	100145
May	0.24	55	100440
June	0.48	51	94549
July	0.26	5	30841
August	0.27	74	117716
September	0.17	71	155346
October	0.12	120	115400
November	0.18	121	148710
December	0.16	168	99932
Totals	**3.12**	**1149**	**1235869**

Ambient Air Monitoring

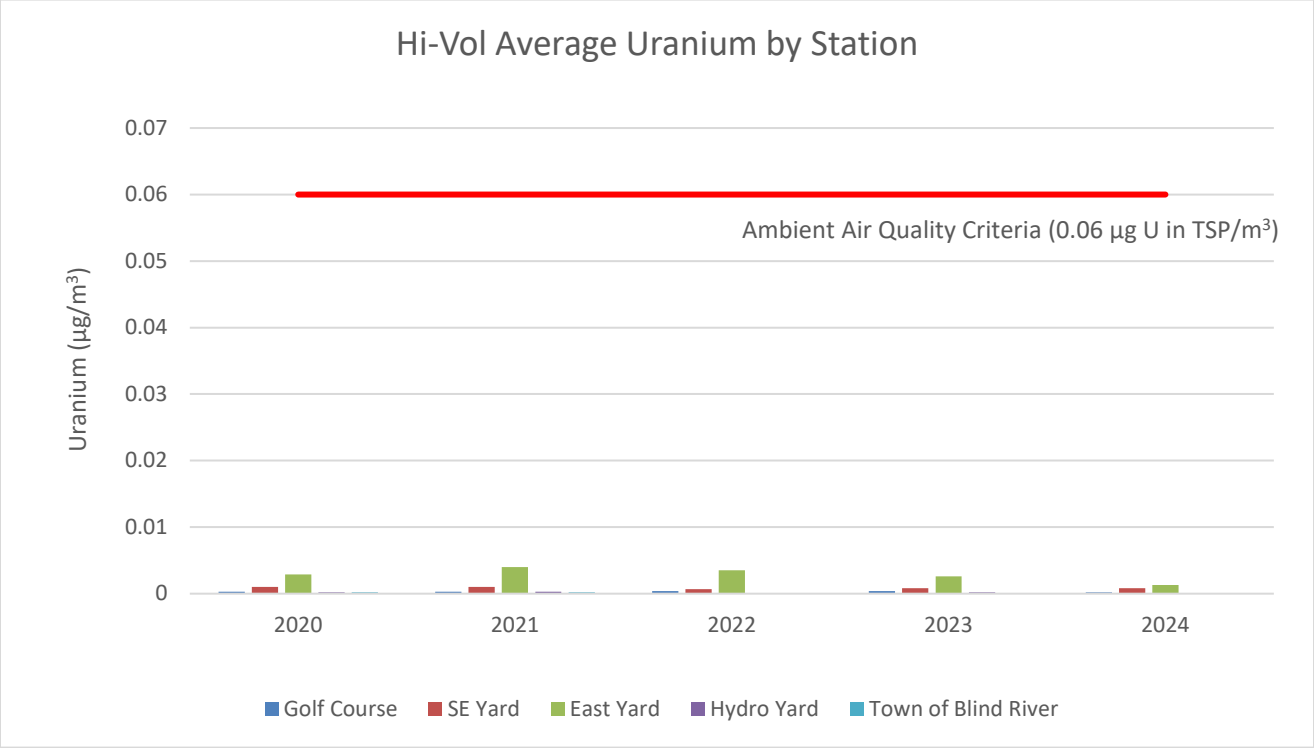
In addition to onsite monitoring of emissions, the refinery also has a comprehensive ambient air monitoring program. High volume air samplers (hi-vols) are used to collect uranium and particulates from the ambient air. Air is drawn into a covered housing and through a filter paper by means of a high flow rate blower. The hi-vol stations are operated continuously when the UO_3 plant is operating, with the filter papers normally being changed once every two weeks. The filter papers are weighed before and after being placed in the field to determine particulate emissions and then analyzed for uranium to determine uranium emissions.

Table 35 and Figure 17 show the annual average uranium-in-air concentrations at each of the five hi-vol locations and the maximum individual result for each location. Two of the stations, the SE Yard and the East Yard, are located within the Cameco fence line, which defines the CNSC licensed area. The Golf Course location is also on Cameco property but located outside the fence line. The remaining stations, the Hydro yard and the Town location, are located approximately 1 and 5 km from the refinery respectively. For the three stations furthest away from the refinery, the year-to-year results are largely unchanged over the five-year period. Annual results from all stations remain well below the MECP annual average criteria of 0.06 ug/m3, with the highest annual average location result in 2024 only at approximately 10% of the annual average criteria.

Table 34

Year	Result	Golf Course	SE Yard	East Yard	Hydro Yard	Town of Blind River
2020	Average	0.0003	0.0010	0.0029	0.0002	0.0002
	Maximum	0.0006	0.0073	0.0077	00006	0.0005
2021	Average	0.0003	0.0010	0.0040	0.0003	0.0002
	Maximum	0.0012	0.0025	0.0260	0.0035	0.0006
2022	Average	0.0004	0.0007	0.0035	0.0001	0.0001
	Maximum	0.0010	0.0021	0.0087	0.0003	0.0004
2023	Average	0.0004	0.0008	0.0026	0.0002	0.0001
	Maximum	0.0015	0.0020	0.0058	0.0003	0.0002
2024	Average	0.0002	0.0008	0.0013	0.0001	0.0001
	Maximum	0.0010	0.0057	0.0028	0.0002	0.0002
Average <0.06 µg U in TSP/m^3 (annual) AAQC Maximum <0.3 µg U in TSP/m^3 (24 hr) AAQC						

Figure 17



Soil Monitoring

Soil samples are collected from a number of sampling locations outside the perimeter fence, in the vicinity of the refinery. Starting in 2018, core samples are taken at a 0 to 5 cm depth annually and at a 5 to 15 cm depth at least once every five years. Samples are analyzed for uranium. Table 36 shows the soil sampling results. The average uranium in soil result at the 0 – 5 cm depth for sample locations within 1000 m of the refinery was similar to previous years. The average uranium in soil result at the 5 – 15 cm depth are within the variation of results at the surface. The maximum individual result of 4.3 µg/g U in 2024 was from a sample location south of the perimeter fence and has been the maximum result location in previous years.

All results are well below the Canadian Council of Ministers of the Environment (CCME) guideline of 23 µg/g U for residential or parkland use, with the maximum result in 2024 at less than 19% of this guideline value.

Table 35

Soil Uranium Results				
Location	**Depth (cm)**	**Number of Samples**	**Average (µg U/g)**	**Range (µg U/g)**
2024				
Sampling sites within 1000m	0-5	7	1.7	0.8-4.3
	5-15			
Sampling sites outside 1000m	0-5	2	0.6	0.3-0.9
	5-15			
2023				
Sampling sites within 1000m	0-5	7	1.5	0.7-3.2
	5-15	0	-	-
Sampling sites outside 1000m	0-5	2	0.6	0.3-1.0
	5-15	0	-	-
2022				
Sampling sites within 1000m	0-5	6	2.4	1.1 – 5.7
	5-15	7	1.1	0.62 – 1.5
Sampling sites outside 1000m	0-5	2	0.9	0.6 – 1.2
	5-15	2	0.7	0.28 – 1.2
2021				
Sampling sites within 1000m	0-5	7	1.6	0.7 – 2.9
	5-15	0	-	-
Sampling sites outside 1000m	0-5	2	0.6	0.3 – 1.0

Soil Uranium Results				
Location	**Depth (cm)**	**Number of Samples**	**Average (µg U/g)**	**Range (µg U/g)**
	5-15	0	-	-
2020				
Sampling sites within 1000m	0-5	7	1.4	0.5 – 2.5
	5-15	0	-	-
Sampling sites outside 1000m	0-5	2	0.7	0.4 – 1.0
	5-15	0	-	-

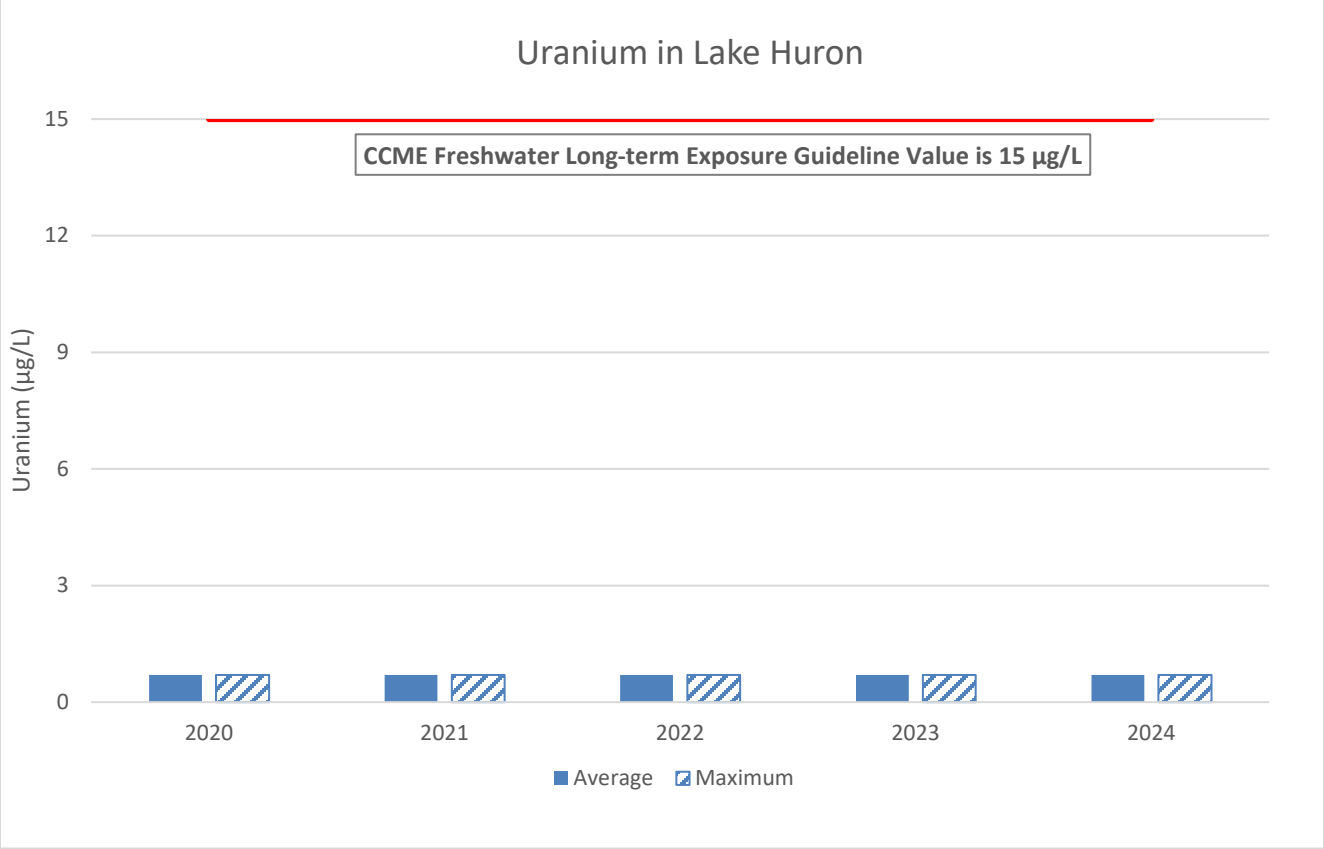
Surface Water Monitoring

Table 37 and Figure 18 show surface water results for uranium at the location of the refinery outfall diffuser in Lake Huron. All uranium results are well below the CCME long-term exposure guideline value of 15 µg/L, with the maximum result at less than 5% of this guideline value. Results are similar to those reported in previous years. TBP analysis showed all results below the detection limit of 0.13 mg/L.

Table 36

Lake Huron at the Diffuser							
Parameter	**Units**	**Value**	**2020**	**2021**	**2022**	**2023**	**2024**
Uranium	**µg/L**	**Average**	<0.7	<0.7	<0.7	<0.7	**<0.7**
		Maximum	<0.7	<0.7	<0.7	<0.7	**<0.7**
Nitrate	**mg/L as N**	**Average**	0.2	0.2	0.1	0.1	**0.2**
		Maximum	0.2	0.2	0.3	0.2	**0.2**
Radium-226	**Bq/L**	**Average**	<0.0005	<0.0005	<0.0005	0.0006	**0.0007**
		Maximum	<0.0005	<0.0005	0.0006	0.0010	**0.0007**
pH	**-**	**Average**	7.9	7.7	7.2	7.5	**7.8**
		Maximum	7.9	8.3	8.0	8.1	**8.2**

Figure 18



Groundwater Monitoring

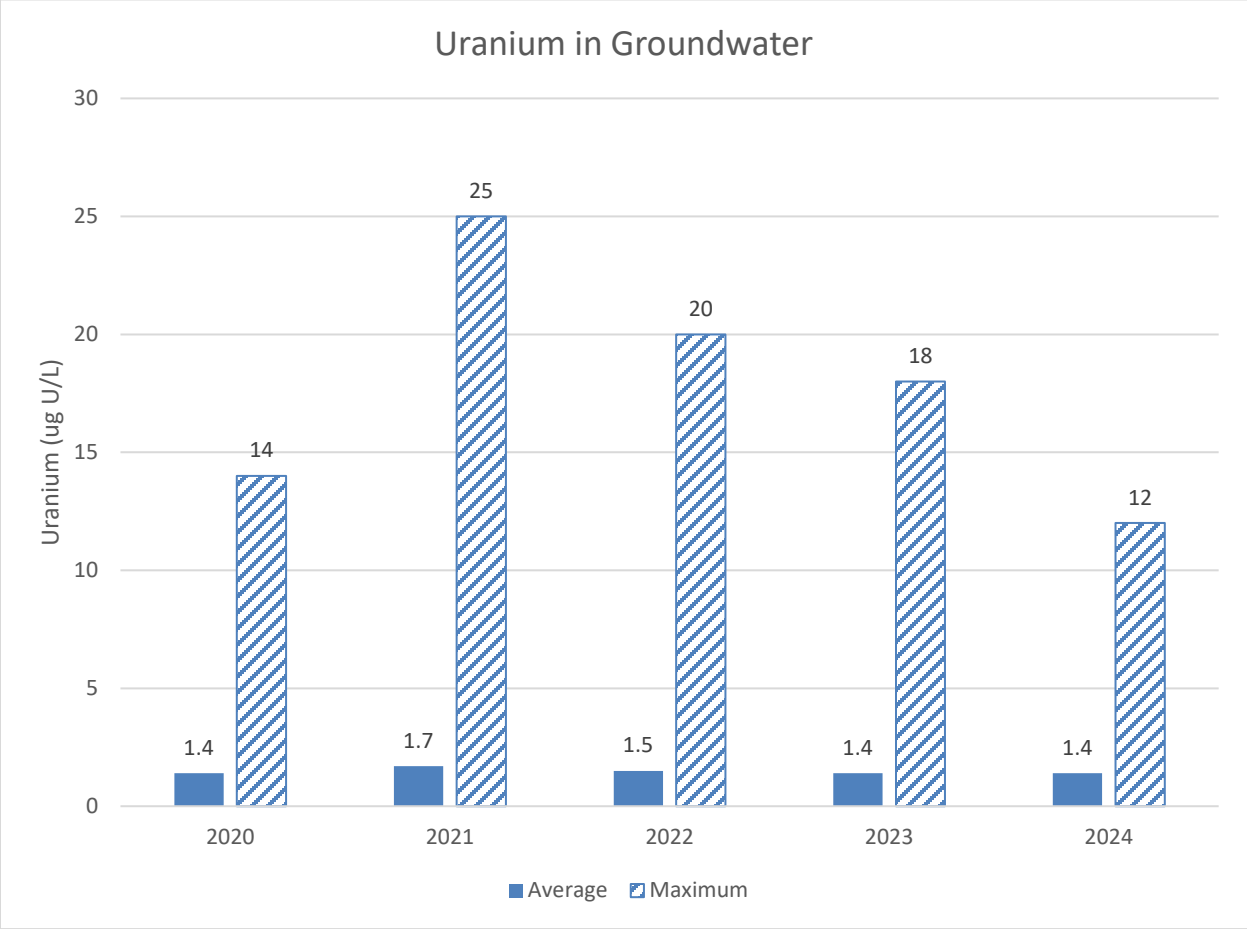
Cameco has an extensive groundwater monitoring program in place around the refinery with a total of 35 monitoring wells: 14 inside the perimeter fence and 21 outside the fence line. monitoring at each well location varies from once per year to three times per year depending on the location of the well relative to the refinery. Similarly, the parameters monitored and/or analyzed for at each location also varies. The groundwater moves in a southwesterly direction towards the Mississagi River.

A summary of groundwater uranium results is shown in Table 38 and Figure 19. The average uranium result from all groundwater samples analyzed slightly decreased in 2024 compared to 2023. Groundwater results in 2024 were below the Provincial Full Depth Generic Site Condition Standard in a Potable Groundwater Condition (Table 2) value of 20 µg/L uranium. Given the location of the refinery and the direction of groundwater flow in the area, there is no possible impact to drinking water sources from supply wells downstream.

Table 37

Uranium in Groundwater results							
Parameter	**Units**	**Value**	**2020**	**2021**	**2022**	**2023**	**2024**
Uranium	**µg/L**	**Average**	1.4	1.7	1.5	1.4	1.4
		Maximum	14.0	25.0	20.0	18.0	12.0

Figure 19



In 2021, Cameco submitted a formalized Groundwater Protection Program (GWPP) to meet the requirements of Canadian Standards Association Group (CSA Group) Standard N288.7-15 "Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills" (Standard N288.7-15). This was accepted by CNSC staff in early 2022.

Effluent and Environmental Monitoring Program Performance

The facility Environmental Protection Program sets out the effluent and environmental monitoring requirements for the facility to ensure adequate environmental protection measures are in place. The general criterion for acceptable program performance is that at least 90% of planned samples for each analyte in each effluent in the effluent program and at least 90% of planned samples for all media will be obtained with all analytes meeting data acceptance criteria.

- Plant effluent discharge – 100% of planned samples were collected and analyzed
- Stack samples – 99.5% of planned samples were collected and analyzed
- Environmental Samples (i.e. surface water, groundwater, Hi-Vol, soil) – 100% of planned samples were collected and analyzed

All analysis completed followed AN 003 Quality Assurance Procedure for Analytical Services and the appropriate analytical method for the required analysis. If a method blank, replicate, spiked blank or spiked sample did not meet the data acceptance criteria, no results were reported, and all of the sample set was repeated until the appropriate QA/QC samples met acceptance criteria.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on a review of environmental monitoring data, internal assessments and the fact that there were no CNSC action level exceedances.

2.3.4 Emergency Management and Response

This safety and control area 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.

Effective emergency response is carried out through the refinery Emergency Response Plan (ERP). The plan assigns specific accountabilities and sets out processes and procedures to protect the health and safety of employees, contractors, the public and the environment in the event of an emergency. The ERP was last updated and reissued in 2024. The site emergency management and response program meets the requirements of CNSC REGDOC-2.10.1: *Nuclear Emergency Preparedness and Response*.

As the primary response provider for the facility, the refinery's Emergency Response Team (ERT) currently comprised of 47 fully qualified members that are in place to respond to emergencies at the facility with 6 more in training. ERT personnel are trained to National Fire Protection Association (NFPA 600) standards for advanced internal/exterior firefighting, NFPA 472 operations level for hazardous material response, and standard first aid and CPR.

A memorandum of understanding was developed with the Blind River Fire Department (BRFD) and Cameco in 2024 to replace the existing mutual aid agreement. The commitment for assistance by the BRFD provides an additional layer of support to the refinery's emergency response capability. In addition, Cameco provides the BRFD with support, either financial or through the donation of equipment, and conduct joint training exercises annually with the BRFD so that in the event of an emergency at the refinery requiring off-site assistance, there will be a coordinated and effective response.

To continually provide a high level of response capability, the refinery's ERT regularly engages in a number of training drills, exercises and courses. In 2024, joint training was completed with the Town of Blind River Fire Department. ERT drills, including off-shift and evacuation drills, were completed as planned. Regular ERT training was completed including first aid, hazmat, fire and industrial rescue. Lastly, on an annual basis Cameco meets with the local contractor that delivers UO_3 tote bins to the PHCF to review practices and procedures related to the shipment of UO_3, including reporting protocols and how to respond to a transportation event involving a uranium spill.

All internal drills and exercises were assessed against pre-defined expectations and opportunities for improvement were recorded and tracked to completion. The emergency response program is also subject to Cameco internal audits. A full-scale simulation emergency response exercise involving the local EMS and hospital is typically held once every three years and was last carried out in the fall of 2024.

Emergency response is a key component of an effective Fire Protection Program (FPP). The FPP at the facility meets internal Cameco requirements and it also meets the requirements of the *National Fire Code of Canada* (NFCC), the *National Building Code of Canada* (NBCC), and CSA N393-13: *Fire protection for facilities that process, handle or store nuclear substances*.

In developing the FPP, a defense-in-depth approach was used to ensure that the fire protection measures are adequate for the fire protection of the facility. The FPP is made up of the Fire Hazard Analysis (FHA) and fire protection supporting documents. The FHA identifies fire hazards and their potential impact related to life safety, radiation safety, environmental protection and asset protection and was last submitted to CNSC staff in 2021.

The fire protection supporting documents address a number of areas including fire prevention, fire protection and emergency response. The supporting documents define those elements which positively contribute to prevent fires, maintain fire safe conditions at the facility, maintain reliability of the fire protection systems and provide an effective emergency response to limit the effects of fire. These supporting documents are updated on a regular frequency.

As specified in our CNSC LCH, BRR is subject to annual third-party reviews for verification of the inspection requirements under the National Fire Code and CSA 393. Findings in the 2024 inspection review related to fire doors, storage of combustibles and other materials, obstruction of pull stations and egress and fire separations.

In addition to this third-party inspection, Cameco conducts routine monthly fire inspections of the facility to identify deficiencies in fire protection elements and fire protection systems. All identified issues are documented and tracked until they have been addressed. In addition to these specific fire protection inspections, routine inspections of the facility are done daily by site security staff, who have been instructed to report any potential fire hazards noted during their rounds.

Cameco continues to utilize a divisional oversight role for the fire and emergency response organizations. This allows for alignment, consistency and sharing of best practices within the division. A gap analysis against CSA N393-22, NFCC-20 and NBCC-20 and an implementation plan submitted to the CNSC. BRR has implemented the required changes to meet the new standard.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on training statistics, responder performance during the drills and regular review of the emergency response and fire safety plans.

2.3.5 Waste and By-product 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 also covers the ongoing decontamination and planning for decommissioning activities.

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.

Wastes generated at BRR are segregated at the point of generation into contaminated and noncontaminated as appropriate. Non-contaminated waste can be recycled or disposed of at an appropriate facility. A portion of the non-contaminated waste generated is incinerated on site. While this increases the volume of contaminated ash generated marginally, it dramatically decreases the amount of material sent to the local landfill. Contaminated combustible materials are incinerated on site and the contaminated ash is stored pending recycle for uranium recovery. Contaminated non-combustible waste is stored in appropriate containers pending assessment of recycling or other disposal options.

In 2024, a total of 36,270 kg of non-contaminated wastes were sent to a local landfill, which is an increase from the 16,380 kg sent in 2023. A total of 37,530 kg of non-contaminated materials were sent to appropriate recycling facilities in 2024, an increase from the 25,920 kg sent in 2023. The increase is attributed to the increase in project work completed onsite in 2024.

BRR produces two secondary products at the facility; calcined and regeneration product, both of which are sent off-site to licensed facilities for uranium recovery. A uranium mill in the USA is licensed to receive both products, while Cameco's Key Lake operation is licensed to receive calcined product. However, all shipments of calcined product in 2024 were sent to the USA, since Key Lake did not operate last year. A total of 3,758 drums of calcined product were generated at BRR in 2024, a slight decrease compared to 2023. There were 4,800 drums of calcined product shipped off-site, an increase from the 3,900 drums shipped the previous year.

A total of 259 drums of regeneration product were generated in 2024. There were 228 drums of regeneration product shipped, double the number from the previous year. The number of drums of calcined and regeneration product shipped in a given year will vary with annual production, site inventory levels, transportation schedules and end-user requirements.

In 2024, the BRR incinerated 23,569 kg of contaminated combustible materials (CCM) and sent 68,501 kg to a hazardous waste landfill for disposal. This eliminated the backlog inventory of CCM at the refinery. Incinerator operating days in 2024 were impacted by maintenance requirements. BRR received limited CCM material from Cameco operations in Port Hope in 2024, as part of the effort to reduce the backlog of material for incineration.

A total of 1 761drums of contaminated non-combustible materials (CNC) were generated in 2024, a slight increase from the previous year. BRR shipped 540,685 kg of contaminated non-combustible waste to an appropriately permitted hazardous waste landfill in 2024.

BRR sent 3,536 drums back to various uranium facilities for reuse in 2024, an increase from the 1,040 drums sent in 2023. In addition, a total of 484,237 kg of crushed drums and clean drum rings were processed, decontaminated to unrestricted release criteria and sent to a local scrap metal dealer. Also, 452 drums of shredded metal were processed in 2024, compared to 548 drums in the previous year.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on on-going waste management reduction activities.

2.3.6 Nuclear Security

This safety and control area 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.

BRR's 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, the security plan and related procedures are considered prescribed information, subject to the requirements of the *Nuclear Safety and Control Regulations, 2015*.

Though the refinery's security program is well managed and developed, the facility continues to look for opportunities to enhance the existing program.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective.

2.3.7 Safeguards and Non-proliferation

This safety and control area covers the programs required for the successful implementation of the obligations arising from the Canada/IAEA Safeguards and Non-proliferation Agreement.

There were three Short Notice Random Inspections (SNRI) conducted at the request of the IAEA in 2024. In addition, the IAEA conducted two design information verification (DIV) inspections, a Complementary Access (CA) and a physical inventory verification (PIV) in 2024.

The refinery is in compliance with the requirements in CNSC REGDOC-2.13.1: *Safeguards and Nuclear Material Accountancy*.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on outcome from IAEA inspections throughout the year.

2.3.8 Packaging and Transport of Nuclear Substances

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

UO_3 is produced and transported, in steel tote bins, by road from the refinery to Cameco's PHCF. As well, UO_3 is transported in drums via road, rail and/or marine transport to customers in the USA and on occasion, other countries around the world. The tote bins and drums meet the Type IP-1 package requirements as specified in the CNSC *Packaging and Transport of Nuclear Substances Regulations, 2015*.

The refinery had no reportable transportation related events in 2024.

In addition to the FSD Transportation Emergency Response Organization (TERO) organization, Cameco can also mobilize a hazardous materials response team with trained emergency response team members and dedicated HAZMAT equipment. An Emergency Response Assistance Plan (ERAP 2-0453) is on file with and has been 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 the refinery are included in the plan. Cameco reviews and updates the Emergency Response Assistance Plan as required.

This safety and control area was assessed as part of the 2024 annual management review and considered to be effective based on a lack of reportable BRR-related transportation events and regular reviews of transportation-related documents.

3.0 OTHER MATTERS OF REGULATORY INTEREST

3.1.1 Public Information Program

In 2024, Blind River Refinery continued to fully meet the requirements of the Canadian Nuclear Safety Commission's (CNSC) REGDOC 3.2.1, Public Information and Disclosure.

In 2024, the communications team for Cameco's Fuel Services Division was comprised of a director of public and government affairs, a specialist, Indigenous engagement and two communications specialists who joined in March. The divisional communications team is part of Cameco's Corporate and Community Relations department (formerly Sustainability and Stakeholder Relations).

Cameco leverages a range of communications tools to help inform and educate interested persons and/or groups of Blind River Refinery (BRR) operations and activities.

The Blind River Refinery's general manager provided a delegation to council on June 3. The presentation provided a general update on the Refinery's operations, environmental and safety performance and community activities.

On June 6, approximately 50 Cameco employees took part in the Refinery's 19th annual Cameco Cares Day, helping to complete projects in public spaces in the communities of Blind River, Mississauga First Nations, Township of the North Shore and the Municipality of Huron Shores.

Cameco also participated in Blind River Community Days in July by sponsoring the children's inflatable play area and by participating in the community's first Touch-A-Truck event the same weekend which provided an opportunity to share information about the Refinery and other Ontario operations.

Cameco's second annual community barbeque was held on September 12 from 4 - 6 p.m. at Seller's Park in Blind River. Invitations to the event were emailed to the municipality, Mississauga First Nation, community organizations, service clubs, schools and sports associations. The barbecue was also promoted on Cameco social media pages and a featured article in the online newspaper, Elliot Lake Today. Cameco leadership and subject matter experts were available to talk with guests and answer questions. The BBQ was attended by the Mayor of Blind River and a few councilors. Information boards and displays provided information about BRR, the spring polling results and involvement in the community. Over 300 people attended the BBQ.

On October 5 Cameco sponsored an information booth at the Blind River Fall Fair. The event was free to the public and the booth was staffed by Cameco subject matter experts throughout the

day. The booth featured large poster size information boards on topics such as the benefits of nuclear energy and Cameco's Public Information Program (PIP). Takeaways included information about all of Cameco's Ontario operations as well as recruitment information. There was interaction with 166 people that stopped by the booth and entered the Cameco giveaway draw.

Public Inquiries

Ensuring stakeholders and residents have access to information about Cameco is an important component of the Public Information Program. Interested persons can contact Cameco via email (cameco_ontario@cameco.com) or phone (905.800.2020).

Twenty RSVPs for the community barbecue in September and one request for a Refinery tour through were received through the Cameco Ontario email address.

Social Media

@Cameco.Ontario @CamecoOntario @Cameco_Ontario

The following are examples of content and updates provided across Cameco Ontario's social media channels:

- Cameco's participation in industry events such as the Canadian Nuclear Association conference
- Employment opportunities
- Cameco's charity golf tournament in Blind River
- Community notices including Blind River's planned emergency exercise
- Community investments including Blind River Refinery's donation to Rogers Arena

In 2024, the Cameco Ontario Facebook page grew by 135 followers (9.6% increase YoY) ending the year with 1,545 followers. The 183 posts over the course of the year shared information about Cameco's operations, community initiatives and sponsorships.

In 2024, Cameco's Instagram page has continued to grow, reaching 1,011 followers, and 18.1% increase or 155 followers. Content is similar to that which is posted on Facebook.

The Cameco X (Twitter) page grew 21 followers (4.6% YoY) to 453 followers by the end of the year.

Public Disclosures

In 2024 there were three public disclosures. These disclosures were related to a reportable spill, a reportable leak and discharge as well as an ERT activation. There were no health or environmental impacts or from any of the incidents.

Posting Date	May 3, 2024
Incident Date	May 2, 2024
Incident	Reportable Spill
Details	On April 18, a sink hole was observed near two groundwater supply wells for the Blind River Refinery, close to the Mississaugi River. This sinkhole was located adjacent to the golf course, situated west of the parking lot, which is part of the Town property leased from Cameco. As a precautionary measure, we promptly cordoned off the affected area and initiated the process of determining next steps to have the underground well water supply line repaired. Cameco has been closely monitoring the sinkhole and noted no significant changes. On May 2, it was observed that there is now additional groundwater flow from the well line, carrying sediment and overflowing into the river. There was no health or safety risk posed to the public, workers, or the environment by the release of groundwater that had not been used by the refinery.
Corrective Action	Cameco is working to rectify the situation and has contacted a contractor to install a silt curtain and are in the process of securing hydrovac services. Additionally, Cameco is actively pursuing a separate contractor to repair the well supply line. The Canadian Nuclear Safety Commission, Town of Blind River and the Ministry of Environment, Conservation and Parks have been notified.
Cameco Environmental Effect Rating	1

Posting Date	July 30, 2024
Incident Date	July 1, 2024
Incident	Reportable Leak & Discharge
Details	On June 26, 2024, when the glycol heating systems were drained for maintenance, a mechanical failure occurred. It was observed that the drain valve on number three coil was leaking glycol. A pipe cap was immediately installed to stop the leak. It was assumed the leak had been minimal and there was minimal glycol in the system since the coil had been isolated and drained in 2023 when it had failed. During a maintenance inspection, it was determined that glycol had passed through the sewage plant and was released to Lake Huron on July 1, 2024. A lab investigation estimates 70L of glycol had spilled. There was no health or safety risk posed to the public, workers, or the environment by this release.
Corrective Action	An investigation is currently underway by Cameco to prevent future occurrences. The Canadian Nuclear Safety Commission, Town of Blind River and the Ministry of Environment, and Conservation and Parks have been notified.
Cameco Environmental Effect Rating	1
Posting Date	November 29, 2024
Incident Date	November 28, 2024
Incident	ERT Activation
Details	On November 28, a pull station was activated at the Blind River Refinery when a small fire was observed inside of a 5-gallon plastic pail in the plant. The fire was extinguished using a nearby fire extinguisher. Due to the speedy response and action of the emergency response team there was no health or safety risk posed to the workers or the environment.
Corrective Action	The fire was extinguished and cleaned up. The Canadian Nuclear Safety Commission was notified.
Cameco Environmental Effect Rating	1

The posts can be found on Cameco Ontario's website: Environment & Safety - Refining: Blind River - Fuel Services - Businesses - Cameco.

No questions were received from members of the public.

Community Investment

Cameco continued to develop partnerships and to provide financial and volunteer support to numerous events and organizations in Blind River and the surrounding area; 69 organizations received support in 2024 including:

- Town of Blind River Boom Camp Trail signage
- Town of Blind River Community Days children's inflatable park
- Mississauga First Nation (Golf Classic and Pow Wow)
- Serpent River First Nation annual education awards banquet
- City of Elliot Lake Rogers Arena – cheque presentation
- Town of Thessalon Community Days
- Township of the North Shore Canada Day celebration
- Huron Shores Family Health Team Healthy Aging Fair
- North Shore Health Network long-term care facility gardens project
- North Shore Firefighter Challenge
- Jeunesse-Nord technology and math program

The Cameco Fund for Mental Health raised $18,000 to support mental health initiatives in Blind River and area. Funds were raised through Cameco's third annual charity golf tournament held in May at the Huron Pines Golf and Country Club. Adjudication for the Cameco Fund for Mental Health took place in November and involved Cameco representatives and local mental health experts. In Blind River and area, seven organizations received a mental health grant. Recipients were notified and a news release was issued.

Cameco continued sponsoring a monthly not-for profit online news feature program in Elliot Lake Today for Blind River organizations. Some of the groups to receive coverage included the Timber Village Museum, Algoma Paddlers, Meals on Wheels, Blind River Horticultural Society, Blind River Sno Riders, Blind River Minor Baseball and Blind River Soccer Association.

- https://www.elliotlaketoday.com/directory/propane-and-fuel-companies/cameco-blind-river-85939/content

Cameco utilized two of the feature spots to promote its charity golf tournament as well its community barbecue:

- Blind River Charity Golf Tournament: Ending the stigma around mental health - Elliot Lake News
- Cameco Community Barbecue back again September 12 - Elliot Lake News

Cameco Cares Day was held on June 6. Employees volunteered their time and skill to support projects in Blind River, Mississauga First Nations, Township of the North Shore and the Municipality of Huron Shores.

Industry

Cameco attended the Canadian Nuclear Association conference which took place in Ottawa from February 27 to March 1, 2024. Cameco was a bronze sponsor' of the conference and staffed a booth.

Earned Media

Cameco received media coverage throughout the year covering a range of activities:

- Students at Jeunesse-Nord create unique 3D printed designs – December 7 - Elliot Lake Today
  - Students at Jeunesse-Nord create unique 3D printed designs - Elliot Lake News
- Cameco supports arena repair in Elliot Lake – December 6 – Elliot Lake Today
  - Cameco supports arena repair in Elliot Lake - Elliot Lake News

Sponsored Content

- Blind River Charity Golf Tournament: Ending the stigma around mental health – May 29 Elliot Lake Today.com – *Sponsored Content*
  - Blind River Charity Golf Tournament: Ending the stigma around mental health - Elliot Lake News
- Cameco Community Barbecue back again – August 29 Elliot Lake Today.com – *Sponsored Content*
  - Cameco Community Barbecue back again September 12 - Elliot Lake News

Public Polling

A public opinion survey of 153 Blind River residents was conducted between May 28 and June 10, 2024, by a third-party consultant, Praxis Consulting. The objective of the survey was to estimate support for Cameco's location operations and to gather opinions and perceptions regarding the corporation.

Blind River residents continue to demonstrate strong support for local Cameco operations. According to the spring public opinion survey, 95 per cent of respondents expressed pride in having Cameco as part of the Blind River community and there is 92 per cent awareness of the Refinery.

Prior to the 2024 survey, the last survey was administered in 2021.

Further 2024 survey highlights include:

- 98% of respondents are supportive of Cameco's Blind River Refinery

- 94% of Blind River respondents describe themselves as knowledgeable about Cameco Corporation
- 89% of respondents agree Cameco has the environmental monitoring in place that protects the Blind River community
- 83% of respondents have no concerns about the Refinery

2024-BRR-Public-Opinion-Survey-Summary.pdf

Government

Government relations (GR) involves building strong relationships and positive interactions with local elected officials. Cameco engages in GR activities at the municipal, provincial, and federal levels. The majority of federal engagements take place through Cameco's GR experts located in Ottawa and Saskatoon. Locally, the focus is primarily on municipal and provincial officials.

On June 3, the Blind River Refinery general manager provided an update on the Refinery's activities to the Town of Blind River Mayor and Council.

In addition to posting the quarterly and annual reports on the FSD website, BRR provides these CNSC reports to the Town of the Blind River and the Township of the North Shore.

Tours

Providing facility tours is a valuable component of BRR's engagement and outreach activities.

Cameco provided a tour to representatives of the Ontario Provincial Police on May 22 and the North Shore Health Network Foundation on December 13.

Advertising

Cameco conducts advertising to support various activities in the local community. In 2024, much of the advertising was conducted through social media platforms, local news websites and local radio.

Social media advertising was used to build awareness of Cameco's Step Up for Mental Health golf tournament in Blind River, as well as the application process for funding and the community barbeque. The social media campaigns on Facebook and Instagram ran at various times through the year:

- Blind River Cameco Charity Golf Tournament
- Cameco Fund for Mental Health Applications – Blind River

- Cameco Community Barbeque

In addition to the Christmas Greetings from the general manager in print, The Sentinel and The Standard, and on radio, Moose FM 94.1, Cameco continued sponsoring a monthly not-for profit online news feature program in Elliot Lake Today for Blind River organizations. Some of the groups to receive coverage included the Timber Village Museum, Algoma Paddlers, Meals on Wheels, Blind River Horticultural Society, Blind River Sno Riders, Blind River Minor Baseball and Blind River Soccer Association. Cameco utilized two of the feature spots to promote its charity golf tournament and community barbecue.

  - https://www.elliotlaketoday.com/directory/propane-and-fuel-companies/cameco-blind-river-85939/content

Cameco placed print ads in the Elliot Lake Entertainment Series performance booklet, Elliot Lake Arts on the Trail brochure and elementary school fire safety booklets for grades 2/3 students in Blind River. In addition, Cameco advertised on reusable shopping bags which were given out to all attendees at the Blind River Trappers Reunion in the spring and the Huron Shores Family Health Team's Healthy Aging Fair in the fall.

Cameco also sponsors boards at the Blind River Community Centre Arena, Huron Pines Golf and Country Club, Blind River Curling Club and the Elliot Lake Granite Sport and Social Club.

Website

Cameco has a dedicated website for its Ontario operations: Home - Cameco Fuel Services.

Cameco updated its website with information throughout 2024 including:

- The Compliance Reports were posted to the website:
  - Media Library - Media - Cameco Fuel Services
- Information about the community barbeque was posted to the website:
  - Blind River Community BBQ - Making a Difference - Community - Cameco Fuel Services
- News release announcing Cameco Fund for Mental Health application open:
  - Cameco Announces $18,000 to Support Mental Health Initiatives in the Blind River Area | Cameco Fuel Services
- News release announcing Cameco Fund for Mental Health grant recipients:
  - Cameco Fund for Mental Health 2024 awards grants to seven Blind River area organizations | Cameco Fuel Services

Communications Products

Cameco strives to provide accurate and timely information to stakeholders and other interested parties. Information products are developed to support various communications and engagement vehicles and activities.

Information was communicated through news releases, social media and the website as listed in the respective sections.

An invitation to the community barbeque was posted on the website and via social media. The invite was also posted on community bulletin boards.

Information boards were featured at the community barbeque and fall fair to share information about the Blind River Refinery such as regulatory compliance, benefits of nuclear and the Public Information Program.


Cameco
Regulatory
Compliance.
Cameco's Blind River Refinery is regulated by the CNSC in accordance with the federal Nuclear Safety and Control Act and regulations.
The nuclear industry is rigorously regulated by Canada's nuclear regulator, the Canadian Nuclear Safety Commission (CNSC).
Cameco's Blind River Refinery is licenced by the CNSC through to 2032.
Cameco is inspected by numerous regulatory agencies from the federal, and provincial government, including:
The Canadian Nuclear Safety Commission (CNSC)
Ministry of Environment, Parks & Conservation
International Atomic Energy Agency
Human Resources and Skills Development Canada (Labour)
All Cameco sites are registered under the ISO 14001 environmental management standards program, and subject to required annual independent audits and re-certification every three years.
Cameco has systematic safety programs based on the specifications of OHSAS 18001, an international occupational health and safety program.
Environmental incidents and other events at Cameco's licensed facilities are reported to regulatory agencies as required by federal and provincial regulations. This includes releases to the environment reportable to Ontario Ministry of Environment's Spills Action Centre.

3.1.2 Indigenous Engagement

Cameco is committed to providing information to interested Indigenous communities. The Mississauga First Nation (MFN) is Cameco's closest neighbour and Cameco continues to have regular communication with MFN through established protocols such as the notification of live fire practices and community support. Cameco also continues to work with MFN to formalize the relationship. In the past, Serpent River First Nation (SRFN) requested to receive the Blind River Refinery's compliance reports. Cameco continues that practice today.

The Métis Nation of Ontario North Channel has requested to be informed of significant events and transportation incidents. For example, when there is a public disclosure regarding transportation, Cameco continues to uphold its commitment and provides this information.

Cameco representatives met with MFN Chief and Council members on January 19 to discuss the Preliminary Decommissioning Plan (PDP). The PDP is a financial guarantee that is reviewed every five (5) years and presented by Cameco to the Canadian Nuclear Safety Commission as a requirement of licensing. Cameco provided details on the plan, the various stages of decommissioning a facility and when stakeholder and Indigenous engagement would take place. Open discussion regarding the PDP with questions on the topic were answered during the meeting.

Cameco representatives met with Serpent River's Chief and Lands Manager virtually on January 23 to discuss the PHCF PDP and the overall PDP process. No questions or concerns were raised during the meeting.

On April 30th, select Cameco staff attended the First Peoples House of Learning at Trent University and participated in the Two-Spirit History training. On June 26th, the Two-Spirit training was brought to PHCF where it was attended in-person and offered virtually across all Canadian Cameco sites.

On May 28, an email was sent to MFN to advise members that a professional public polling research firm named Praxis Consulting was hired. Praxis Consulting conducted a Blind River and area telephone survey throughout the month of June.

Cameco provided support to MFN for the Little NHL tournament in February. On May 16, Cameco supplied reusable bags, and a duffle bag with health and safety related items for MFN's annual Health Fair. On June 6, for Cameco Cares Day, members of Cameco cleaned and planted the Dream Catcher Garden along with the annual and perennial gardens surrounding the Band Office. In addition, four garden benches were built for the walkways and two raised flower beds were built for the Educational Centre's new medicine garden.

Cameco sponsored Serpent River First Nation's Annual Education Awards Celebration on June 11 and MFN's annual Pow Wow on July 3. On August 6, Cameco sponsored MFN's first annual golf tournament.

On September 12, an email was sent with an invitation to the Blind River Community BBQ and on September 24, Cameco sent an email to MFN to inform them of a planned emergency exercise at the Blind River Refinery. On October 8, email communication was sent to MFN with information regarding Cameco's Fund for Mental Health and how to apply.

On December 19, Cameco sent a letter to the Museum of History in Gatineau QC in support of MFN's repatriation efforts.

Compliance reports were provided to MFN and Serpent River First Nation throughout the year, and on May 5 a Public Disclosure was sent to MFN regarding a reportable spill at the Refinery.

Below is a list of meetings in 2024:

Indigenous Community	Date of Meeting	Topics
Mississauga First Nation	January 19	Cameco met with MFN Chief and Council in-person to continue joint relationship discussions and areas of interest. Cameco provided information on the PHCF Preliminary Decommissioning Plan (PDP).
Serpent River First Nation	January 23	Cameco met with SRFN Chief and Lands Manager virtually to provide an overview of the PHCF PDP and PDP process.
Mississauga First Nation	June 26	Cameco met with MFN Chief and Council in-person to continue joint relationship discussions and areas of interest.

3.1.3 Site - Specific

Cameco has an accepted Preliminary Decommissioning Plan (PDP) and financial guarantee for the BRR.

The BRR met all other site-specific reporting requirements.

3.1.4 Improvement Plans and Future Outlook

The following is a summary of improvement plans for 2025.

BRR completed a number of sustaining capital projects in 2024, including installation of new denitration pots, repairs to the HVAC systems, replacement of components of fume control systems, replacement of the third stage boildown flash chamber and repairs to floor coatings. A large 2025 sustaining capital portfolio includes such key projects as continuation of the HVAC upgrade project, boiler tube replacement and rehabilitation of Eldorado Road. Improvements for 2025 include expansion of the site WiFi network, and the implementation of a reliability improvement program.

Cameco remains committed to continual improvement and will continue to look for opportunities to make the site operate more efficiently, while minimizing risk to employees, the public and the environment. With respect to environment and waste management Cameco is looking to continue reducing the historical inventory of waste management materials at the site. BRR also has additional capital projects planned in 2025 related to maintenance of aging infrastructure.

There are no major changes planned in 2025 that could require Commission approval.

3.1.5 Safety Performance Objectives for Following Year

There are no major changes planned in 2025 that could require Commission approval.

BRR will continue to look at ways to continually improve the operation to make the site operate more efficiently, while minimizing risk to employees, the public and the environment. Safety performance in 2024 and planned safety initiatives for 2025 were discussed earlier in Section 2.3.2. Minor changes, including any identified in the previous sections of this report, will continue to be made in 2025 to help improve the operation.

BRR is not currently planning any other changes in 2025 that will impact the equipment, procedures, production capacity, organization and licensing documents of the facility. If changes are to be planned, the proper method of notification and communication will be completed within regulations and principles, designed to meet and or exceed requirements.

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.

In 2024, BRR did not exceed any CNSC regulatory limits. As a result of the effective programs, plans and procedures in place, BRR 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.