Nuclear Energy Canada Inc.

1025 Lansdowne Ave.
Toronto, Ontario Canada

ANNUAL COMPLIANCE MONITORING REPORT

January 1 to December 31

2021

The information contained in this report concerns the performance and operation of BWXT Nuclear Energy Canada Inc.'s (BWXT NEC) Class IB nuclear fuel facility located in Toronto Ontario. This report is prepared to meet fuel facility operating licence FFL-3621.00/2030 condition 3.2. The content demonstrates adherence to the BWXT NEC commitment to operate a safe Class IB nuclear fuel facility, as well as demonstrate compliance with applicable regulations and licence conditions specified by the Canadian Nuclear Safety Commission.

Revision	Description	Prepared by Date	Approved by Date
00	Initial Issue	EHS Team 2022-04-18	D. Snopek 2022-04-19

Signing Authority Contact Information:

David Snopek, Director, EHS & Regulatory

1160 Monaghan Road

Peterborough, ON K9J 0A8

Phone number: 1-855-696-9588

Email: questions@bwxt.com

Submitted to:

J. Amalraj, CNSC Project Officer on 2022-04-20

1 EXECUTIVE SUMMARY

BWXT Nuclear Energy Canada Inc. (BWXT NEC) has been involved with the Canada Deuterium Uranium (CANDU®) industry from its earliest years. BWXT NEC produces nuclear fuel bundles used by the CANDU fleet to generate clean electricity that powers homes, business and the Canadian economy. BWXT NEC operates in three plant locations: Arnprior, Toronto and Peterborough, Ontario. BWXT NEC's Toronto and Peterborough facilities are Class IB nuclear facility operations. The operating licence issued by the Canadian Nuclear Safety Commission (CNSC) authorizes BWXT NEC to operate and modify its nuclear fuel facility to produce natural and depleted uranium dioxide (UO_2) pellets in Toronto at 1025 Lansdowne Ave.

The purpose of this compliance report is to demonstrate that BWXT NEC Toronto has successfully met the requirements of the Nuclear Safety and Control Act, associated regulations and the Class IB Nuclear Fuel Facility Licence FFL-3621.00/2030 issued by the CNSC on January 1, 2021 and expiring on December 31, 2030. This report is prepared based on the CNSC's *Annual Compliance Monitoring and Operational Performance Reporting Requirements for Class I A & B Nuclear Facilities* and regulatory document 3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class 1 Nuclear Facilities and Uranium Mines and Mills*. Appendices containing confidential, proprietary and prescribed information are submitted to the CNSC separately.

BWXT NEC is committed to continuously improving systems to protect employees, the environment and our communities against environmental, health and safety hazards. We work to implement programs and objectives to conserve natural resources, prevent pollution and minimize waste. Maintaining a safe and healthy work environment for our employees is a top business priority. BWXT NEC has implemented a business management system that defines the requirements of the Quality Assurance (QA) program for the licensed activity, which ensures applicable buildings and facilities, process equipment, and processes used in support of licensed activities are conducted in accordance with the Nuclear Safety Control Act, associated regulations, applicable CNSC requirements, jurisdictional requirements and compliance best practices.

No significant operational changes occurred. Upgrades were made to programs with the objective of achieving continuous improvement and environmental health and safety excellence. Details are provided in the main sections of this report. Changes made to the physical facilities, equipment, processes, procedures or practices that could impact employee health and safety, the environment or the public as a result of the operation of the facility are assessed through the business-wide Change Control program.

BWXT NEC has established CNSC accepted A*ction Levels* for various radiological and environmental parameters. An Action Level is defined in the Radiation Protection Regulations "as specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program, and triggers a requirement for specific action to be taken." Action Levels are also applied to environmental protection. Action Levels are facility-specific and set below regulatory limits; however, exceedances are CNSC reportable events. Accordingly, BWXT NEC has established *Internal Control Levels* for various radiological and environmental parameters that are set even lower than Action Levels to act as an early warning system. Internal Control Level exceedances result in internal investigation and correction and are not CNSC reportable events.

Employee workplace radiation exposures are measured by CNSC approved methods and systems. Overall, dose trends are favourable and consistent with an effective application of the ALARA (As Low as Reasonably Achievable - Social and Economic Factors considered) principle. All measured radiation exposures received by personnel in the reporting period were within regulatory limits and Action Levels.

BWXT NEC has established conventional health and safety programs to manage the non-radiological workplace safety hazards to protect personnel. Key performance indicators are used to measure the success of the programs throughout the year. There were zero lost time injuries during the reporting period.

BWXT NEC recognizes that an effective way of maintaining public trust is to maintain environmental excellence. This requires a demonstrated commitment to operating in accordance with the highest environment, health and safety standards. The facility maintains an effective environmental management system to achieve environmental goals and objectives and keep all environmental impacts well within applicable standards and as low as reasonably achievable. This program demonstrates compliance to relevant provincial and federal legislation. The environmental protection program is also compliant with the following standards:

- Canadian Standards Associate (CSA) N288.6-12, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*
- CSA N288.5-11, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*
- CSA N288.4-10, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*.

Air and water emissions are routinely measured to demonstrate compliance with the CNSC's environmental protection requirements and the ALARA principle. There were two CNSC reportable events during the reporting period. The site released a treated water tank without analysis; the investigation confirmed the water to be within regulatory release limits and corrective actions were implemented to prevent reoccurrence. The second reportable event occurred due to Emergency Operations Center activation related to a power failure event. In 2021, BWXT also reported pH values outside of the action level range in 2020 and prior; this information was included in the 2020 annual compliance report. Annual releases were a very small fraction of regulatory limits and all measurements were below Action Levels. Soil samples were taken surrounding the Toronto facility with all measurements within applicable guidelines.

An established emergency response plan is in place that describes the actions to be taken to minimize health, safety and environmental hazards to workers and local members of the public, which may result from fires, explosions, or the release of hazardous materials. The plan is intended to reduce the risk of emergencies such as fires, and assist emergency staff and plant personnel in understanding key emergency response issues. The plan assists the facility in protecting employees, the local community and the environment through sound emergency management practices. The emergency response plan was developed in accordance with CNSC operating licence requirements.

BWXT NEC has implemented and maintains a safeguards program and undertakes all required measures to ensure safeguards implementation in accordance with International Atomic Energy Agency (IAEA) commitments and CNSC regulatory document 2.13.1 *Safeguards and Nuclear Material Accountancy.* Movement (inventory changes) of natural and depleted uranium are documented and reported to the CNSC as required. The IAEA and the CNSC jointly conduct annual verifications.

BWXT NEC safely transports dangerous goods, including Class 7 radioactive material shipments as governed by the *Transportation of Dangerous Goods* Act and Regulations and the Packaging and Transport of Nuclear Substances Regulations. Shipments occur routinely between suppliers and BWXT NEC's Toronto and Peterborough facilities, customers and waste vendors.

BWXT NEC places great importance on its relationships with local Indigenous communities, government and residents in the communities in which it operates and works to ensure there is open communication and awareness of BWXT NEC's operating activities. The public information program defines the process for providing information about BWXT NEC operations. The Community Liaison Committee (CLC), whose mandate is to provide a forum for a cross-section of neighbours and other community stakeholders to share information and ideas, continued to meet regularly.

This compliance monitoring report demonstrates that BWXT NEC has successfully met the requirements of the Nuclear Safety and Control Act, associated regulations and CNSC Class IB Nuclear Fuel Facility Licence conditions.

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2 INTRODUCTION

The purpose of this compliance monitoring report is to demonstrate that BWXT NEC has successfully met the requirements of the Nuclear Safety and Control Act, associated regulations and the Class IB Nuclear Fuel Facility Licence FFL-3621.00/2030 issued by the CNSC on January 1, 2021 and expiring on December 31, 2030. This report is prepared based on the CNSC's *Annual Compliance Monitoring and Operational Performance Reporting Requirements for Class I A & B Nuclear Facilities* and regulatory document 3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class 1 Nuclear Facilities and Uranium Mines and Mills*. Appendices containing confidential and proprietary information are submitted to the CNSC separately.

BWXT Nuclear Energy Canada Inc. (BWXT NEC) has been involved with the Canada Deuterium Uranium (CANDU®) industry from its earliest years. BWXT NEC produces nuclear fuel bundles used by the CANDU® fleet to generate clean electricity that powers homes, business and the Canadian economy. BWXT NEC operates in three plant locations: Arnprior, Toronto and Peterborough, Ontario. BWXT NEC's Toronto and Peterborough facilities are Class IB nuclear facility operations. Nuclear substance use is regulated federally by the Nuclear Safety and Control Act and associated regulations through the CNSC.

The current CNSC operating license authorizes BWXT NEC to operate and modify its nuclear fuel facility. At 1025 Lansdowne Avenue, Toronto (Figure 1), BWXT NEC is authorized for the production of fuel pellets from natural and depleted uranium dioxide. The facility is located in a residential area with some industrial, and commercial, buildings in west-central Toronto (Figure 1). The facility consists of two separate buildings, which are identified as Building 7 and Building 9.

Building 7 houses uranium dioxide pellet manufacturing on the first, second and third floors and office space on the fourth floor. Building 9 is a warehouse used for the storage of uranium dioxide as miscellaneous scrap awaiting reprocessing or shipment for disposal, compaction of waste, and decontamination activities.

Figure 1: BWXT NEC Toronto

2.1 Processes and Materials

The facility processes natural and depleted UO_2 powder into fuel pellets. Specifically, UO_2 powder is received in standard steel drums and the powder is compressed into "slugs" and granulated to a free-flowing powder. This powder is pressed into a pellet shape and the sintered pellets are ground to the required diameter, inspected and wrapped for shipment to the Peterborough facility. BWXT NEC also may periodically ship natural uranium pellets to the United States of America for use in Boiling Water (BWR) commercial power reactors, although no such shipments were made in the reporting period. See Figure 2 for the process.

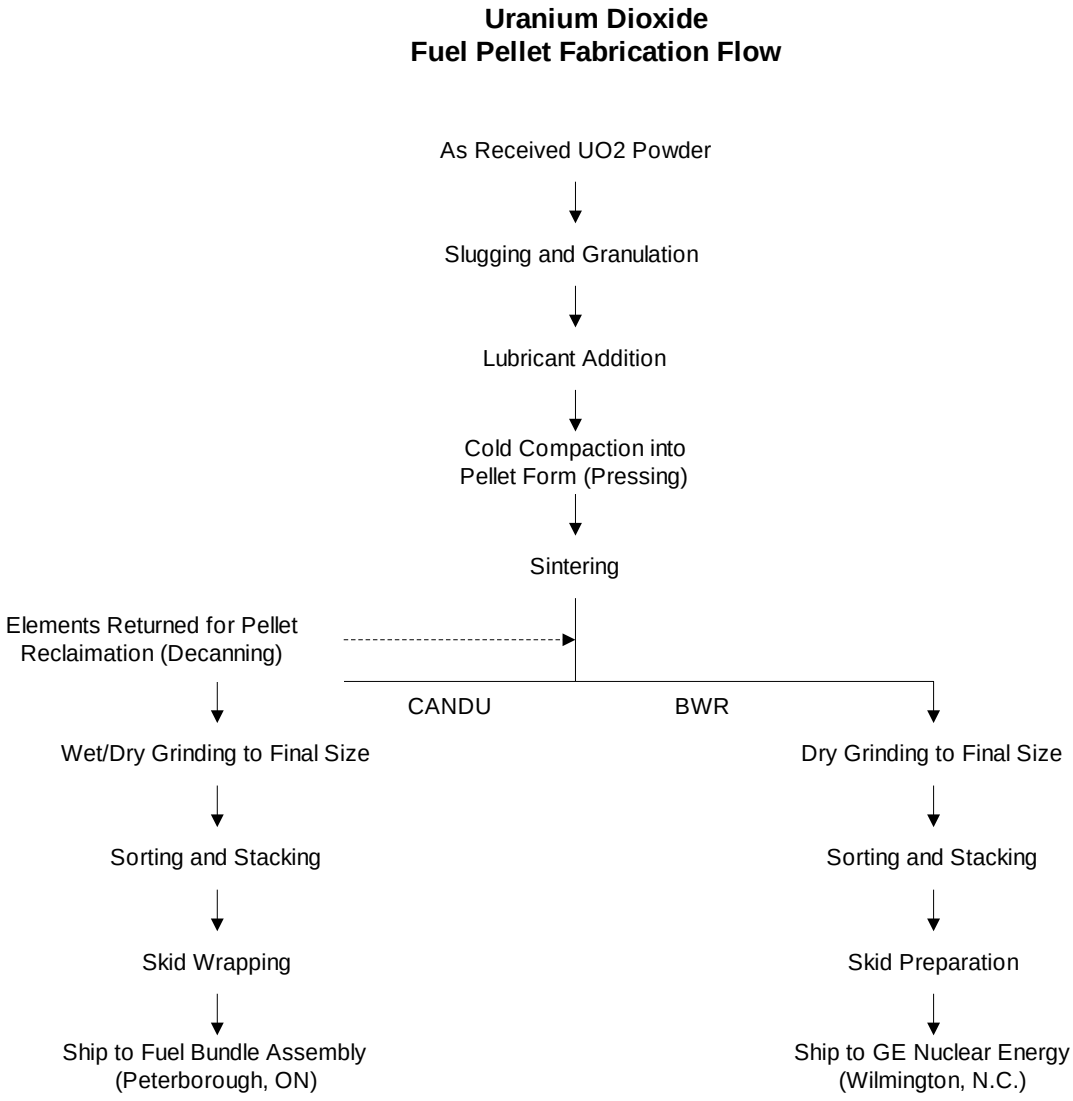

Figure 2: Uranium Fuel Pellet Manufacturing Process

BWXT NEC is federally regulated for health and safety. The federal health and safety legislation is the Canada Labour Code Part II and the Canada Occupational Health and Safety Regulations. The Canada Labour Code is enforced by Employment and Social Development Canada. The purpose of Part II of the *Canada Labour Code* is to prevent accidents and injury to health arising out of, linked with or occurring in the course of employment. BWXT NEC facilities are also regulated federally by Transport Canada. BWXT NEC is additionally regulated environmentally through municipal Sewer Use Bylaws and provincially by the Ontario Ministry of the Environment, Conservation and Parks (MECP).

BWXT NEC is committed to the establishment and continuous improvement of a healthy safety culture. Safety culture refers to the core values and behaviours resulting from a collective commitment by our company's leaders and individuals to emphasize safety, quality, ethics, and security over competing goals to ensure protection of people and the environment. The Environment, Health and Safety (EHS) Mission Statement defines it as a top business priority to continuously improve our EHS systems to protect fellow employees, the environment, and our communities against known and potential environmental, health and safety hazards. The BWXT NEC management team reviews, prioritizes and controls workplace hazards and ensures compliance with the pertinent regulatory requirements, applicable codes and company policies.

The primary potential radiological hazard from uranium at the facility is the inhalation of airborne UO_2 particles. Measurements are performed for airborne and surface traces of uranium as an indicator of process containment efficiency. Urine samples provided by employees are used to indicate if inhalation may have occurred. A lesser potential radiological hazard exists in the form of low-level external gamma and beta radiation exposure to employees. Whole body, skin and extremity dose measurements are conducted to demonstrate compliance with the dose limits specified in the Radiation Protection Regulations and the ALARA principle. All dose measurement results for employees were below regulatory limits and Action Levels.

Air and water emissions are routinely measured to demonstrate regulatory compliance and the ALARA principle. Annual releases were a small fraction of regulatory limits and all measurements were below Action Levels.

Table 1 defines the acronyms used in this report.

Acronym	Definition
ALARA	As Low as Reasonably Achievable (social and economic factors considered)
ATS	Action Tracking System
BWXT NEC	BWXT Nuclear Energy Canada Inc.
CANDU®	CANadian Deuterium Uranium
CCAB	Canadian Council for Aboriginal Business
CCME	Canadian Council of Ministers of the Environment
CLC	Community Liaison Committee
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
CTS	Critical-to-Safety
dpm	Disintegrations per minute - unit of measure for radioactivity 1 dpm = 0.017 disintegrations per second/Becquerel
EHS	Environment, Health and Safety

Acronym	Definition
FHA	Fire Hazards Analysis
IAEA	International Atomic Energy Agency
MECP	Ministry of the Environment, Conservation and Parks
MP	Member of Parliament
MPP	Member of Provincial Parliament
mSv	milliSievert – unit of measure for radiation dose 1 mSv = 0.001 Sv = 1,000 µSv
NEW	Nuclear Energy Worker
PAR	Progressive Aboriginal Relations
PDP	Preliminary Decommissioning Plan
POI	Point of impingement
ppm	Parts per million
QA	Quality Assurance
SSC	Systems, structures and components
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
UO_2	Uranium Dioxide
µSv	microSievert – unit of measure for radiation dose 1 µSv = 0.001 mSv = 0.000001 Sv
WSC	Workplace Safety Committee

Table 1: Definition of Acronyms

3 SAFETY AND CONTROL AREAS

3.1 Operating Performance

The "Operating Performance" Safety and Control Area covers an overall review of the operations licensed activities.

BWXT NEC has successfully implemented and maintained a program for safe operation of the facility and reflects the Facility Safety Analysis. BWXT NEC has established essential documentation (as specified by the Business Management System) including procedures describing the program or system process and work instructions outlining the steps required to complete an individual or set of tasks. This includes the written work instructions for handling of radioactive materials by workers to ensure activities are conducted in a manner that is protective of workers, the public and the environment; as well as full and accurate records to show the acquisition of nuclear substances, inventory of all radioactive nuclear substances and the disposition of all nuclear substances acquired for use or processed by BWXT NEC.

Over the reporting period, BWXT NEC continued to operate in a manner that supports the company mission to continuously improve EHS systems to protect fellow employees, the environment, and communities

against known and potential environmental, health and safety hazards. Operating performance is monitored with key performance indicators and program goals. Reporting of EHS-related concerns is encouraged through a rewards program. These are assigned and tracked to completion in the Gensuite® software system and is used as a measure of employee engagement. In accordance with EHS program requirements, internal audits and self-assessments are conducted routinely to assess conformance to internal and external requirements. Due to company travel restrictions related to the COVID-19 pandemic, all self-assessments and audits during the reporting period were conducted remotely/virtually. Related licensed activity audits and self-assessments are summarized in subsequent sections.

The BWXT NEC management team continued to review, prioritize and control workplace hazards and ensure compliance with the pertinent regulatory requirements, applicable codes and company policies. With the declaration of the pandemic in early 2020 and BWXT NEC's inclusion as an essential business, production activities continued throughout 2021 with safety policies and programs in accordance with relevant provincial regulations and public health requirements.

Facility operations continued routinely and safely. Challenges continued as a result of the pandemic including contractor availability and supply chain difficulties. Despite these challenges, UO_2 pellets were shipped to BWXT NEC's Peterborough facility without incident. Plant personnel followed procedures satisfactorily, as reflected in internal and external audits, self-assessments, radiation surveys, contamination monitoring, air sampling measurements and other safety inspections. Details are provided in subsequent sections of this report. There were no Action Level exceedances and two reportable events over the reporting period.

The President of BWXT NEC is responsible for all activities within the company. The various functional groups, such as Human Resources, EHS, Quality and Communications report directly or indirectly to the President. Senior Management accountability for the effectiveness of the management systems is defined. The Director, EHS & Regulatory is responsible for the overall EHS program.

The following key position changes occurred:

- In August of 2021, the Production Manager in Toronto left the business and the Engineering Manager assumed the Production Manager role.

During the reporting period, the Vice President, Strategy & Business Services left the business, with resultant modifications to the company organization structure as shown in Figure 3.

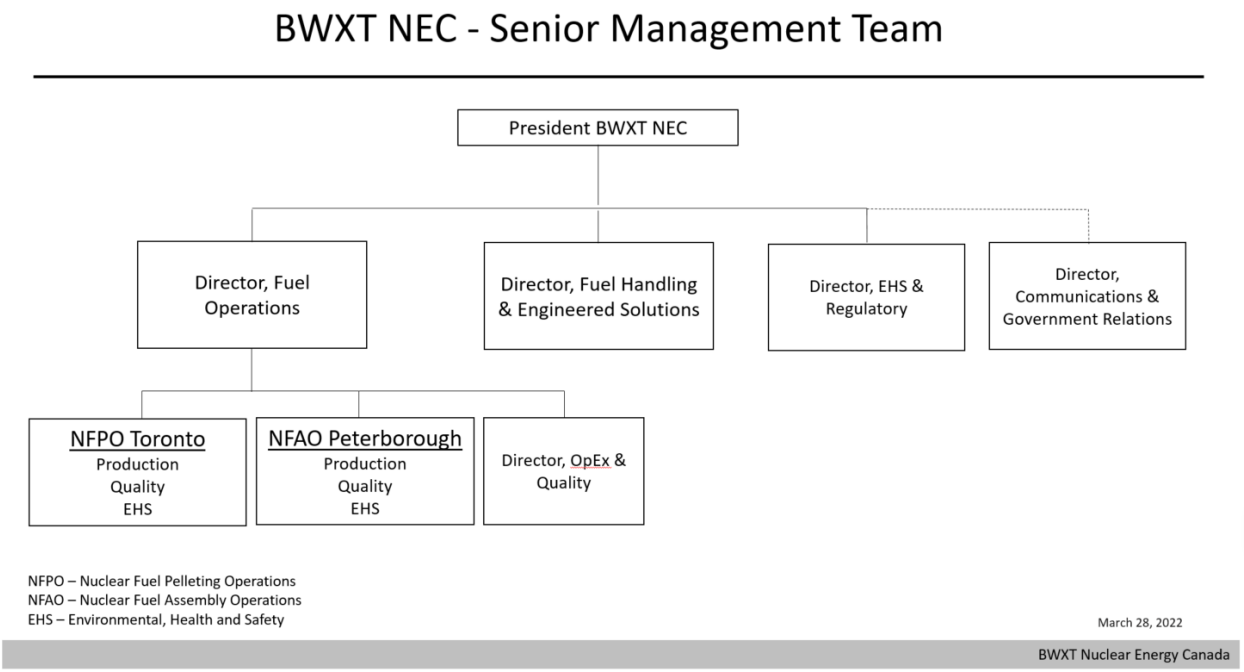

Figure 3: BWXT NEC Organization Structure

BWXT NEC Toronto maintains four EHS related committees that review activities including proposed changes to ensure safe plant operations. They are:

- Health and Safety Policy Committee - comprised of unionized workers and management to contribute to making the company as safe as possible by promoting health and safety awareness, making recommendations to workers and management regarding policies and procedures for safe working practices
- Workplace Safety Committee (WSC) - comprised of unionized workers and management to prevent accidents and occupational illness by promoting health and safety awareness, making recommendations to workers and management regarding safe work practices and monitoring health and safety issues until resolved
- As Low as Reasonably Achievable (ALARA) Committee - comprised of unionized workers and management to continuously improve the radiation safety program and implement ALARA practices where practical to ensure that radiation doses are as low as reasonably achievable.
- Ergonomics Committee - comprised of unionized workers and management to develop, monitor and administer the ergonomic procedure and recognize, reduce and where possible eliminate physical and cognitive ergonomic risk factors.

3.1.1 Possession and Processing

All possession and monthly processing limits, as specified in the CNSC facility operating licence were met. Production data is proprietary and is provided separately to the CNSC in Appendix A.

Production shutdowns were scheduled periodically throughout the year for engineering projects, equipment maintenance and continuous improvements. In the reporting period, there were four weeks of production shutdown, including three weeks in the third quarter and one week in the fourth quarter.

3.1.2 Regulatory Inspections

Excluding safeguards related inspections, which are described in section 3.13 of this report, the CNSC completed one routine inspection during the reporting period.

1. An inspection was completed in October to provide an overall assessment of BWXT NEC's Management Systems and Operating Performance programs. One notice of non-compliance was issued with respect to auditing of management system elements. Two recommendations were issued with respect to documentation improvements.

In addition,

2. The City of Toronto was onsite in May to observe the new water sampling port and retrieve water samples. An officer returned in September to retrieve water samples at the manhole during release of the water effluent tank. There were no concerns with May or September sampling results.

All corrective and preventive actions related to Action Notices/Non-compliances are submitted to the regulator and tracked to closure.

3.2 Management System

The "Management System" 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.

The management system defines the requirements of the QA program for the licensed activity, which ensures applicable buildings and facilities, process equipment, and processes used in support of licensed activities, are conducted in accordance with the Nuclear Safety Control Act and associated regulations, applicable CNSC requirements, jurisdictional requirements and compliance best practices. A graded approach is used in the application of the management system program elements, such that the requirements are applied in a manner commensurate with the safety significance of the licensed activity, system, component or structure. The management system is comprised of the following core program elements:

1. Organization and Responsibilities
2. Personnel Capability
3. Use of Experience
4. Work Planning Control
5. Work Processes Control
6. Verification
7. Problem Identification and Resolution
8. Corrective Action
9. Change Control
10. Document Control and Records
11. Audits

12. Management Self-Assessment
13. Management Program Review
14. Supply Chain

The President of BWXT NEC is responsible for all activities within BWXT NEC. Operations and the various functional groups, such as Human Resources, Environment Health and Safety, and Quality Assurance, report directly or indirectly to the President.

Senior Management accountability for the effectiveness of the management systems has also been defined. For example, the Director, Operational Excellence and Quality has been assigned the responsibility for monitoring and assessing the effectiveness of the business licensed activity management system and is responsible for identifying problems, initiating or recommending solutions, and confirming their implementation and effectiveness. The company senior management organization structure is shown in Figure 3.

The management system is fully implemented and compliant with CSA N286-12, *Management System Requirements for Nuclear Facilities*. All management system documentation required by operating licence condition 2.1 is in place. The EHS Policy establishes the direction for the management system. Continuous improvement is achieved through several review processes, including self-assessments, audits, and management reviews. There were no major changes to the management system or responsibilities during the reporting period.

BWXT corporate policy describes BWXT's commitments to the establishment and continuous improvement of a safety culture. The safety culture refers to the core values and behaviors resulting from a collective commitment by BWXT NEC leaders and individuals to emphasize safety, quality, ethics and security over competing goals to ensure protection of people and the environment.

BWXT NEC is committed to maintaining a strong safety culture and clearly states the expected safety culture behavior. For example, the promotion of a standard set of human error reduction tools for job-site workers and knowledge workers, which include 1) Procedure Use and Adherence 2) Questioning Attitude 3) Situational Awareness and 4) Self-Checking. BWXT NEC's commitment to a strong safety culture is measured by tools such as employee concerns, incident investigations, audits and self-assessments, use of experience and corrective action program metrics which measure the effects of safety culture improvements. External agencies such as the CNSC audit BWXT NEC operations against CSA standards which include safety culture requirements (e.g., CSA N286-12).

In the reporting period, there were no major program changes. Where required, revised documents were submitted to CNSC staff in accordance with the requirements in the licence conditions handbook.

3.2.1 Licensed Activity Related Self-Assessments

The Self-Assessment program governs a proactive process for self-critical, candid and objective evaluation of performance by a functional area measuring their process performance against internal procedures, expectations, goals established from business plans or external benchmarking standards. The Self-Assessment Program is a management tool used to engage the workforce in early and proactive detection of organizational or systematic weaknesses. It is a Functional Manager's opportunity to take a structured look at their own function. Self-Assessments help identify low level issues or trends for early resolution before more significant problems occur.

A Self-Assessment schedule is prepared annually and ensures that each program element is reviewed periodically based on a risk-related approach. A summary of self-assessments conducted in the reporting period is provided in Table 2. The identified non-conformances were of low consequence, with the majority related to improvements in documentation accuracy and compliance, as well as record keeping. All

identified non-conformances not corrected during the assessment were assigned and tracked to closure. There were no systemic deficiencies identified. The assessed program elements were determined to be effective.

In addition to the Self-Assessment program, routine compliance reviews are periodically completed against regulatory EHS requirements, such as general environmental, water management, safety management and emergency response.

Program Element	Number of Non-Conformances
Respiratory Protection	5
Waste	7
Audits	4
Management of Self-Assessments	0
Preventive Maintenance Program	5
Fire Protection Program	0
Environmental Protection Program	2
Management Programs	1
Procurement	4
Total	28

Table 2: Summary of Self-Assessments

3.2.2 Licensed Activity Internal Audits

Internal auditing is an independent, objective activity designed to add value and continuously improve programs. Periodic assessment of program effectiveness is conducted through systematic internal audits that are planned and carried out on behalf of management to measure performance, the effectiveness of the program element processes and to promote continuous improvement. An audit schedule is prepared annually and ensures that each licensed activity program element is audited at least once every three years.

Table 3 provides a summary of internal audits conducted in the reporting period. The identified non-conformances were of low consequence, with the majority related to the accuracy and detail in documentation and implementation of practices. All identified non-conformances not corrected during the audit were assigned and tracked to closure. There were no systemic deficiencies identified. The assessed program elements were determined to be effective.

In addition, a summary review of all non-conformances is conducted as part of the management review to determine if any systemic deficiencies have been identified. Based on the review, continuous improvement opportunities are discussed and documented in meeting minutes with actions tracked to closure.

Audit Scope	Number of Non-Conformances
Document Control and Records	3
Environmental Management System (ISO-14001:2015)	0
Environmental Protection (Waste)	3
Maintenance	2
Radiation Protection (Radiation Instrumentation)	0
Total	8

Table 3: Summary of Internal Audits

BWXT NEC did not conduct any formal external audits of other facilities during the reporting period that related to the licensed activities at the facility.

3.2.3 Management Reviews

Management reviews for EHS program elements are conducted annually before the end of April each year to review the previous calendar year activities. The EHS management reviews encompass the following items:

- Status and follow-up of actions from previous management reviews;
- Results of applicable external agency audits;
- Open regulatory compliance obligations;
- Results of “Reg Auditor” (Gensuite) compliance evaluations;
- Results of QA for licensed activity internal and external audits (where applicable);
- Results of QA for licensed activity management self-assessments;
- Trends in non-conformances (Gensuite Action Tracking System items) for closure metrics;
- EHS related QA Actions;
- Trends in Incident and Measurement (Gensuite) items for root cause;
- Status of EHS training activities;
- Procurement process;
- Extent to which Environmental, Health and Safety and ALARA objectives and targets have been met;
- Radiation dose trends;
- Communications and changes in the needs and expectations of interested parties, including complaints;
- Changing external and internal issues, including compliance obligations;
- Changes in risks and opportunities;
- Opportunities for continual improvement;

- Evaluation of the effectiveness and continuing suitability of the EHS Mission Statement and the Environment, Health and Safety Program, which includes the EHS management system and hazard prevention program.

The above inputs are reviewed to ensure continuing suitability, adequacy and effectiveness of the management system. The criteria for these are:

- **Suitable**: Does the system satisfy the requirements and represent the best way of doing things for our business?
- **Adequate:** Is the system fit for its current purpose?
- **Effective:** Does the system enable the right things to be done? Is it driving continuous improvement?

Formal meeting minutes are prepared. The previous management review meeting resulted in seven actions that were formally issued for follow-up by the applicable functional lead(s), and were tracked to closure in the Action Tracking System (ATS). Five actions were for additional data review in greater detail in separate meetings with a targeted group of people. One action was to improve the presentation of data, and one action was related to improved communication of the EHS Mission Statement. No systemic deficiencies were noted. Overall, the implemented management system for the licensed activity program was considered suitable, adequate and effectively implemented at both facilities. Continuous improvement remains a priority.

3.3 Human Performance Management

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

The training program is outlined in the Licensed Activity QA Manual, and business-wide training procedures. Qualifications and training requirements are identified and personnel are given the appropriate training to ensure they are competent at the work they do. This training includes on-the-job training, radiation safety and respirator protection training. Workers only perform functions for which they are qualified. The Toronto facility achieved 100% regulatory training completion in the reporting period. Compliance to regulatory training completion is a key performance indicator that is tracked throughout the year. Key EHS course completion details are provided in Table 4. Note: n/a indicates that zero employees required the course during the reporting period.

Course Name	% Complete
Aerial Lift Practical	n/a
Aerial Lifts	n/a
Change Area Contamination Control	100%
Compressed Gas Safety	100%
Electrical Safety 2.0 – Canada	100%
Emergency and Disaster Preparedness – Canada	100%

Course Name	% Complete
Emergency Response & Fire Prevention Awareness	100%
Fall Protection Advanced	100%
First Aid (Emergency Response Team)	100%
Indoor Hoisting and Rigging – Canada	100%
Lockout Tagout (LOTO) Procedure	n/a
Lockout/Tagout 2.0 – Canada	100%
Lockout Tagout (LOTO) Try-Out Demonstration	100%
Portable Fire Extinguishers – Canada	100%
Powered Industrial Truck - Driving Evaluation	100%
Radiation Safety	100%
Respiratory Protection 2.0 - Canada	100%
Security Awareness	100%
Transportation of Dangerous Goods	100%
Workplace Hazardous Materials Information System (WHMIS)	100%

Table 4: Key Training Course Completion Summary

During the reporting period there were opportunities to improve training. Examples of these include:

- The implementation of a formal SAT based training program for the site Security Guards with a focus on the training of BWXT Work instructions.
- The implementation of a Foreign Material Awareness training course focusing on preventing materials from getting inside the products we design, build, inspect and maintain.
- Participation in a new Quantitative Fit Testing training course.

The facility is staffed with 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 and associated regulations. EHS and other staff are available after business hours as needed through cell phones and paging devices.

3.4 Safety Analysis

The "Safety Analysis" Safety and Control Area covers the maintenance of the safety analysis which supports the overall safety case for the facility. The safety analysis is a systematic evaluation of the potential hazards associated with the conduct of an activity or facility, and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. The safety analyses utilize a

combination of What-if Analysis, Hazards and Operability and Quantitative Risk Analysis and documents a systematic evaluation of hazards associated with the licensed facilities.

Modifications to the facility are made in accordance with the business-wide Change Control program, which requires review of EHS parameters for new or modified facilities, processes, and new or relocated machinery, apparatus and equipment. Under this process, a proposed modification is screened for potential impact on the facility safety analysis. Where screening identifies a potential impact, a more detailed review of the proposed modification is conducted to identify if the change impacts a safety system, or the basis of the safety assessment (e.g. materials, quantities, locations, etc.). Third-party reviews or regulatory approvals are conducted as required. In this way, impacts on the safety analysis are identified and the safety analysis is validated and updated, where necessary.

During the reporting period, an update of the facility safety analysis report was completed to reflect changes in uranium inventories and locations. The safety analysis report concludes that the engineered and administrative controls provide protection over a broad range of operating conditions that both restricts the likelihood of events and adequately protects the public and environment.

3.5 Physical Design

The "Physical Design" Safety and Control Area relates to activities that impact on the ability of systems, structures and components (SSC) to meet and maintain their design basis, given new information arising over time and taking into account changes in the external environment.

Changes made to the physical facilities, equipment, processes, procedures or practices that could adversely affect product quality, employee health and safety, the environment or the public as a result of the operation of the facility are assessed through the Change Control program. Any changes to the design basis are identified and assessed by key stakeholders through this program, including third-party reviews as required. Adequate mitigations are applied including modification of the proposed change, up to rejection of the proposed change.

During the reporting period, there were no modifications to the physical plant that altered the design basis and no significant facility changes.

3.6 Fitness for Service

The "Fitness for Service" 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 function when called upon to do so.

A Critical to Safety (CTS) program is in place. CTS items are those hardware items that directly ensure the safety of workers, protection of the environment, or regulatory compliance in the following three categories:

- Equipment and infrastructure identified as Safeguard Measures in the Facility Safety Analysis report;
- Respiratory personal protective equipment; and
- Instrumentation generating data to demonstrate Regulatory Compliance.

BWXT NEC documentation describes the CTS program for the production of nuclear fuel. Equipment identified on the CTS list is governed by a number of assurance procedures.

The CTS program elements include the following:

- Process to identify CTS equipment;
- CTS inventory list revision control;

- Procurement controls governing ordering and incoming verification to confirm CTS equipment received matches the CTS equipment list requirements;
- Requirements in the established change management program to adequately capture new additions and ensure sufficient detailed review of changes to existing CTS equipment; and
- The factors determining the preventive maintenance schedule of CTS Equipment.

The facility is using an asset management and preventive maintenance software system. Maintenance Connection® is a web-based maintenance management software for work order and asset management. Maintenance Connection assists BWXT NEC in efficiently managing preventive maintenance tasks as well as to control and identify maintenance on CTS and Critical-to-Quality assets and components. Preventive maintenance tasks on CTS equipment are designated in this system as described in the business wide Enterprise Asset Management Program Procedure.

Certain CTS tasks have associated immediate independent post-maintenance verification or testing. For example, independent verification is in place on the ventilation systems during filter changes as well as following rotoclone ductwork maintenance.

In the reporting period, 99% of CTS tasks issued were completed within 14 days of the target completion date. All CTS tasks issued in the reporting period are closed.

Preventive maintenance is considered during the assessment of changes as part of the business-wide Change Control program. Additionally, in the event of a near miss, incident, injury, inspection or suggestion, the preventive maintenance program for related equipment is reviewed as applicable. As a result, during the reporting period, the following improvements to preventive maintenance tasks were implemented:

- A new semi-annual task was implemented for zinc dispensing in order to inspect and clean the zinc dispensing tank.
- A new bi-weekly task was implemented for zinc dispensing in order to inspect the Mist Eliminator Filters and clean the water level sensors to prevent zinc build up.
- Super boat carts are utilized to transfer pellets in molybdenum boats on molybdenum slabs from the press to the furnace. A new design modification of the super boat cart safety bar mechanism was implemented to prevent future near misses of the molybdenum slabs/boats from falling off due to malfunction of the original safety bar. The improved safety bar mechanism has been standardized across all super boat carts in the facility and 6-month preventive maintenance tasks are conducted to inspect for any wear and tear of the sub-assembly safety bar components.

Managing aging means ensuring the availability of required safety functions throughout the service life of the plant, with account taken for changes that occur with time and use. Aging management applies to SSCs that can, directly or indirectly, have an adverse effect on the safe operation of the plant. The asset management program accounts for aging through the CTS program inspection, testing and maintenance tasks. These processes provide warning signs and initiate corrective and preventive maintenance activities. Items identified for replacement are assessed through the Change Control program.

The preventive maintenance program is periodically assessed through self-assessments and internal audits, discussed in section 3.2 of this report. Key performance indicators are in place and are routinely reviewed. The program is adequate and effective and is continually improved.

3.7 Radiation Protection

The "Radiation Protection" Safety and Control Area covers the implementation of the radiation protection program, in accordance with the Radiation Protection Regulations. BWXT NEC has a well-established and

effectively implemented radiation protection program, which includes a commitment to ALARA and continuous improvement. The program addresses the radiation hazards associated with UO_2. This program ensures that surface/airborne contamination and radiation doses to employees and the public are monitored and controlled. The Director, EHS & Regulatory, has oversight of BWXT NEC's radiation protection program.

Internal radiation hazards exist in the form of loose uranium which may enter the body by inhalation, ingestion or absorption. As a result, air monitoring is conducted at various work stations. Workstation air monitoring is a key performance indicator that speaks to effective administrative and engineered controls. A respiratory protection program is in place in accordance with Canadian Standards Associate (CSA) Z94.4-18, *Selection, use, and care of respirators.* Additionally, surface contamination measurements (swipes) are conducted in manufacturing areas of each facility to monitor and reduce the amount of loose radioactive material available for potential internal exposure of employees. As these monitoring processes produce large quantities of data, trending of data is performed at least annually and reviewed by site committees.

Additionally, urine samples are regularly provided by employees to indicate if inhalation may have occurred. Sampling frequency ranges from weekly to monthly, based on established criteria such as job function and worker location within the facility. Criteria which determine the frequency of urine sampling for an employee are documented in the radiation protection program.

A second radiological hazard exists in the form of low-level external gamma and beta radiation doses to employees. Routine gamma surveys are conducted and Nuclear Energy Workers (NEWs) are issued thermoluminescent dosimeters (TLDs) to measure whole body, skin and extremity dose to ensure compliance with the regulatory radiation dose limits and the ALARA principle. Dose results are reviewed by EHS staff on receipt from the licensed dosimetry service provider. In addition, the ALARA Committee reviews trending data from radiation monitoring results through routinely scheduled meetings and provides recommendations to improve ALARA implementation.

As external radiation hazards from the storage and use of radioactive materials may result in radiation doses to workers, routine gamma radiation surveys are conducted using real-time portable handheld radiation detectors. Measured dose rates are compared to established dose rate targets for a given area based on area classification and occupancy. When necessary, items are moved to alternative storage locations and/or shielded. Areas that appear routinely higher than target dose rates are investigated for permanent improvements, such as shielding or reconfiguration.

A component of the radiation protection program is area classification. Areas are classified into four different categories for the purpose of controlling the spread of radioactive contamination, and ensuring appropriate engineered and administrative controls are in place. These classifications are defined in the Radiation Protection Manual as follows:

- Unclassified Area - these areas do not involve nuclear substances and are considered public domain. Incidental contamination does not exceed the unclassified area Internal Control Levels.
- Active Area - these areas are designed for handling materials with loose contamination that is potentially above unclassified area Internal Control Levels. External radiation hazards are not of significant concern.
- R2 Area - these areas are designed for operations involving exposed non-dispersible nuclear substances, where external radiation is of concern and loose contamination may be above R1 Internal Control Levels.
- R3 Areas - these areas are designed for operations involving exposed solid dispersible nuclear substances, where external radiation may be of concern and where the hazard of contaminant inhalation or ingestion is identified. Loose contamination may be above R2 Internal Control

Levels and below R3 Internal Control Levels. Where the inhalation hazard is high, respiratory protection is required for all area entries.

BWXT NEC has established CNSC accepted Action Levels for various radiological and environmental parameters. An Action Level is defined in the Radiation Protection Regulations as "a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program, and triggers a requirement for specific action to be taken." Action Levels are established in accordance with the CNSC regulatory document G-228, *Developing and Using Action Levels*, which are approved by the CNSC and specified in the licence conditions handbook (refer to Table 5). Although Action Levels are set below regulatory limits, exceeding an Action Level is considered a CNSC reportable event in which BWXT NEC must notify the Commission within 24 hours of becoming aware that an Action Level has been exceeded. Accordingly, BWXT NEC has established Internal Control Levels for various radiological and environmental parameters that are set even lower than Action Levels to act as an early warning system. An Internal Control Level exceedance results in internal investigation and corrective and preventive action. During the reporting period, all measurements were below Action Levels and regulatory limits.

Nuclear Energy Worker	Period	Action Level (mSv)
Effective dose	Quarter of a year	6.0
Effective dose	1 year	15.0
Effective dose	5 years	60.0
Skin dose	1 year	350
Extremity dose	1 year	350
Pregnant NEW	Balance of the pregnancy	3.5
Parameter		**Action Level**
Urinalysis		10 µg/L for any period

Nuclear Substance and Form	Action Level		
U in Airborne Contamination	Unclassified Area	R2 Area	R3 Area (non-mask)
	36 dpm/m^3	180 dpm/m^3	270 dpm/m^3

Table 5: Summary of Action Levels for the Radiation Protection Program

BWXT NEC has a well-established integrated management system for environmental, health and safety program excellence. The radiation protection program is effectively implemented. BWXT NEC has an established EHS Mission Statement that is reviewed and signed annually by the President of BWXT NEC. The Mission Statement includes a commitment to ALARA and continuous improvement. Elements of the radiation protection program such as dose monitoring, contamination monitoring, and radiation field surveys, etc. are conducted by qualified workers and reviewed internally by EHS staff and Committees on a regular basis. Details of the reviews are recorded in meeting minutes.

An internal audit and self-assessment of the radiation protection program, with a focus on elements of radiation protection program effectiveness and compliance, is conducted annually. Non-conformances are addressed and tracked to completion in accordance with program requirements.

In accordance with the Radiation Protection Regulations and CNSC Guidance Document G-129, *Keeping Radiation Exposures and Doses As Low As Reasonably Achievable*, BWXT NEC has implemented a

radiation protection program. This document establishes the radiation protection program in place and identifies corresponding procedures to ensure that radiation exposures and doses are kept ALARA.

Key components of the radiation protection program include:

- Compliance with all relevant regulatory requirements;
- The setting of ALARA goals and objectives;
- Hazard recognition, risk assessment and change control processes;
- A comprehensive worker training program; and
- Documented safety concerns, near misses and incidents with appropriate root-cause analysis, preventive and corrective actions.

The radiation protection program includes all worker radiation safety elements that demonstrate compliance to relevant regulations, codes and standards:

- EHS policy commitment to ALARA
- Area classifications and requirements
- Material handling
- Non-routine or high-risk work controls
- Internal and external radiation hazard assessments
- Internal and external radiation monitoring and recording

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, near miss and incident investigations, self-assessments, internal and external audits. During the reporting period, the radiation protection program was revised to reflect regulatory changes to the dose for the lens of an eye for an NEW, as well as other minor updates. The revised manual was submitted to the CNSC. Additional minor continuous improvements were instituted as follows:

- The Radiation Instrumentation work instruction was revised to reflect current practices.
- The Radiation Instrumentation Calibration work instruction was revised to change the hand and foot monitor calibration frequency.
- The Thermoluminescent Dosimeter work instruction was revised to include an internal control level and review process for eye dose estimates.
- The Laundering Effectiveness Monitoring work instruction was revised to reflect current practice.

The radiation protection program is well-established and effective. Radiation dose trends demonstrate the company's commitment to ALARA. Program goals are monitored through the site's ALARA Committees as summarized in section 3.7.1.

3.7.1 ALARA Committee Performance

The ALARA committee works to review and continuously improve elements of the radiation safety program, and implement ALARA practices where practical in order to ensure that radiation dose levels are as low as reasonably achievable. Committee members consist of both unionized and management employees. The ALARA committee targets quarterly meetings at a minimum. The committee met four times during the reporting period. The fourth quarter ALARA committee meeting was a joint committee meeting with WSC

and Ergonomics Committee. Dose results, radiation protection related events, audits, and employee concerns were reviewed and discussed. Actions are assigned and tracked as part of the meeting minutes. Committee activities are communicated to all workers via email distribution or employee notice board postings.

ALARA Committee goals and results for the reporting period are provided in Table 6. The goal to review portable air sampling in locations with no fixed air samplers was not achieved due to resource issues resulting in only two locations sampled. Goals that are not achieved are informally reviewed by the ALARA Committee to discuss probable causes. The feasibility of achievement is discussed and implementation plans revised as needed. These are considered during future goal setting. As radiation doses continue to be well below the regulatory dose limits, dose reductions become increasingly challenging.

ALARA Committee Goals	Actual	Result
Implementation of portable shielding around storage of material.	Completed	Achieved
ALARA presentation at all employee communication meeting.	Completed	Achieved
Review portable air sampling in locations with no fixed air samplers (3 areas).	2/3	Not Achieved
Review CNSC regulatory document 2.7.1, Radiation Protection and how it may impact site.	Completed	Achieved

Table 6: ALARA Committee Goals and Results

2022 goals for the ALARA Committee are established as follows:

1. Investigate portable air sampling in locations with no fixed air samplers (2 areas).
2. Review trending of workstation air results and implement preventative measures for workstations that repeatedly exceed Internal Control Levels.
3. Review trending of swipes and implement contamination control in areas that repeatedly exceed Internal Control Levels.

3.7.2 Radiation Protection Training Program and Effectiveness

Radiation protection training programs are compliant with the systematic approach to training methodology. An internal or external specialist in radiation protection periodically provides classroom training to new and continuing NEWs or those working in areas with radioactive materials. Testing is performed on completion of the training to demonstrate employee understanding. Course content includes general shop floor rules, radiation fundamentals, sources of ionizing radiation, health effects, emergency response and other safety-related content. Training completion is monitored using a learning management software system, which tracks and triggers retraining as required. Course completion details are provided in section 3.3. Training effectiveness is monitored through radiation dose results, internal inspections, self-assessments and audits as well as incident investigations.

3.7.3 Radiation Device and Instrumentation Performance

Radiation detection instrument error can occur due to a variety of factors: drift, environment, electrical supply, addition of components to the output loop, process changes, etc. The facility maintains a system for managing radiation detection instrument calibrations. Calibration is conducted to ensure accurate indication

during field use. Calibrations are performed under environmentally controlled conditions suitable for the inspections, measurements, and tests being performed, as determined by the equipment manufacturer. Calibration intervals are established, so that calibration occurs before any anticipated significant changes occur in measurement capability. Radiation detection equipment calibrations are conducted within 12 months of the previous calibration as required by regulation.

All active radiation devices and instruments were maintained in a state of safe operation. Where calibration is expired or where detectors fail calibration, they are removed from service until they are repaired and meet radiation calibration expectations.

There were no changes to the calibration program during the reporting period.

3.7.4 Contamination Control Data

When radioactive material is handled in a non-sealed container, there is the potential for it to be spread onto other objects. This is known as radioactive contamination. Radioactive contamination refers to nuclear substances on surfaces or within the air, where its presence is unintended or undesirable.

Surface contamination measurements (swipes) are conducted in manufacturing areas. Contamination by itself is not necessarily an indicator of exposure potential but can be used as an indicator of housekeeping conditions; however significant amounts of loose surface contamination has the potential to become airborne. If this occurs, the air monitoring results will reflect the increased airborne concentration and appropriate corrective action is then taken. Internal Control Levels are applied to each area classification. In the event a swipe measurement exceeds an Internal Control Level; the area is cleaned and re-swiped to verify cleanliness. Trends are monitored. There were no significant personnel contamination events during the reporting period.

Routine surface contamination measurement results are summarized in Table 7. Surface contamination remains fairly steady in the number of samples exceeding the Internal Control Levels. Surface contamination results are reviewed by EHS staff and discussed at WSC Meetings. Overall, 99% of swipes were within Internal Control Levels, indicative of effective contamination control measures and cleaning schedules.

Surface Contamination					
Classification and Area Description	Internal Control Level	2020		2021	
		Total Number of Samples	Total Number Samples Exceeding Internal Control Level (%)	Total Number of Samples	Total Number Samples Exceeding Internal Control Level (%)
R3-Powder Preparation, Pressing, Grinding, Laboratory	22,000 dpm/100 cm^2	464	0 (0%)	464	0 (0%)
R2-Sintering, Sorting & Stacking, Laboratory	2,200 dpm/100 cm^2	518	7 (1%)	513	6 (1%)
Active - Plant Washrooms, Laundry Room	2,200 dpm/100 cm^2	120	0 (0%)	120	1 (1%)
Unclassified	220 dpm/100 cm^2	540	17 (3%)	531	8 (2%)

Table 7: Surface Contamination Summary Results

3.7.5 Air Monitoring

As part of well-established and implemented industrial hygiene programs, breathing air is sampled for measurement of uranium content. Workstation air monitoring is a key performance indicator that speaks to effective administrative and engineered controls. A respiratory protection program is in place. Non-routine work functions, such as machine maintenance, modifications, etc. are controlled by Radiation Safety Instructions. These processes specify protective measures, including those to reduce exposure to airborne UO_2. This may or may not include air monitoring and/or respirator use.

Each process workstation is monitored continuously during routine operating conditions for airborne UO_2 and counted in-house. Internal dose to workers is estimated and assigned based on these air monitoring results. Workstation air sampling results are summarized in Table 8.

Workstation Air Monitoring	2017	2018	2019	2020	2021
Number of Workstations Sampled	21	21	21	21	21
Total Number of Samples Collected	5208	5250	5292	5292	5250
Total Number of Samples Exceeding Internal Control Level (area specific)	1	5	8	6	4
Total Number of Samples Exceeding Action Level (area specific)	0	0	0	0	0
Average Concentration (dpm/m^3)	7.1	9.6	8.8	6.7	7.6
Maximum Value Recorded (dpm/m^3)	306	365	433	368	248

Table 8: Workstation Air Monitoring Summary

In the reporting period, four workstation air samples exceeded an Internal Control Level. The results were identified during the daily air sample result reviews. Three were associated with Grinder Swarf Collection and one was associated with Final Press #1.

The elevated results for Grinder Swarf Collection were related to blockage in the flex ventilation hose. The room is classified as an R3 masked area and employees are required to wear a respirator on entry. Maintenance removed solids in the hose and added a new seal to bowl dump station. No intakes or exposures were observed for maintenance employee or operators in the room.

The elevated result for Final Press #1 was related to maintenance of Torit #1 and the common torit in the final press room. The work completed under a radiation safety instruction involved changing filters, vacuuming and clearing any blockage. Due to the nature of the work, some airborne uranium dust was expected. Maintenance employees wore respirators throughout the task. No intakes or exposures were observed for the maintenance employees.

3.7.6 Facility Radiological Conditions

Radiation fields from use and storage of radioactive materials may result in external radiation doses to workers. In order to ensure that radiation dose rates are ALARA, routine gamma radiation surveys are conducted periodically using calibrated portable handheld radiation detectors. Measured dose rates are compared to targets for areas based on area classification and occupancy. When necessary, items are moved to alternative storage locations and/or temporarily shielded. Areas that appear routinely higher than target dose rates may be investigated for improvements, such as permanent shielding or reconfiguration. Routine dose rate measurements are summarized Table 9. Dose rates remain low in radioactive material handling, storage areas and adjacent occupied locations. Variability due to the timing of the surveys is a factor in the results, as production levels and movement of materials vary over the course of a year.

Dose Rates	2017	2018	2019	2020	2021
Total Number of Locations Surveyed	160	160	160	159	160
Average Dose Rate (µSv/h) on Shop Floor	2.6	3.0	2.4	3.9	2.8
Average Dose Rate (µSv/h) in Storage Areas	7.5	5.5	5.3	5.6	5.2

Table 9: Routine Dose Rate Survey Summary

3.7.7 Urinalysis Results

The presence of uranium in the urine is an indication of recent inhalation of UO_2 dust or the systemic clearance of an established thorax burden. At BWXT NEC, urinalysis is used as a screening tool to initiate further review of internal dose control measures and practices but is not used to estimate internal dose. Internal dose is estimated based on workstation air monitoring (refer to section 3.7.9).

All employees working where exposed UO_2 material is processed submit urine samples for uranyl ion analysis weekly or monthly, depending on the work area. Samples are analyzed by an external laboratory for uranium content using Inductively Coupled Plasma - Mass Spectrometry with a minimum detectable concentration of 0.1 µg U/L. Results are compared to Internal Control Levels and Action Levels and entered and retained in an electronic database. Urinalysis results are summarized in Table 10.

During the reporting period, there were no sample results above the Internal Control Level of 5 µg U/L. There were no Action Level exceedances. This demonstrates that current engineered and administrative controls, where applicable, are adequately controlling the inhalation hazard.

Urinalysis	2017	2018	2019	2020	2021
Number of urine samples analyzed	1621	1600	1594	1646	1499
Number of samples above Internal Control Level (5 µg U/L)	0	0	0	0	0
Number of samples above Action Level (10 µg U/L)	0	0	0	0	0
Maximum result (µg U/L)	4.9	3.5	3.8	4.0	2.7

Table 10: Urinalysis Results Summary

3.7.8 Radiation Doses

Radiation dose refers to the energy deposited or absorbed in materials through which it passes. Equivalent dose is used to assess how much biological damage is expected from the absorbed dose. It takes the properties of different types of radiation into account. Effective dose is used to assess the potential for long-term effects that might occur in the future. It is a calculated value, measured in milliSievert (mSv), which takes into account the absorbed dose to all organs of the body, the relative harm level of the type of radiation, and the sensitivities of each organ to radiation. All radiation exposures received by employees in the reporting period were within Internal Control Levels, Action Levels and regulatory limits. Action Levels are site specific and are accepted by the CNSC through the facility operating licence conditions handbook. Regulatory limits are specified in the Radiation Protection Regulations. Regulatory limits are listed in Table 11 and Table 12. All measured radiation doses received by individuals in the reporting period were within Internal Control Levels, Action Levels and regulatory limits.

Effective Dose Limits		
Person	**Period**	**Effective Dose (mSv)**
NEW, including a pregnant NEW	(a) One-year dosimetry period (b) Five-year dosimetry period	50 100
Pregnant NEW	Balance of the pregnancy	4
A person who is not a NEW (i.e. a member of the public)	One calendar year	1

Table 11: Regulatory Effective Dose Limits

Equivalent Dose Limits			
Organ or Tissue	**Person**	**Period**	**Equivalent Dose (mSv)**
Lens of an eye	(a) NEW (b) Any other person	One-year dosimetry period One calendar year	50 15
Skin	(a) NEW (b) Any other person	One-year dosimetry period One calendar year	500 50
Hands and feet	(a) NEW (b) Any other person	One-year dosimetry period One calendar year	500 50

Table 12: Regulatory Equivalent Dose Limits

All workers are classified as either NEWs or Non-NEWs. All NEWs are deemed to have a reasonable probability of receiving a dose of radiation that is greater than the prescribed limit for a member of the public (1 mSv/year) in the course of the person's work with nuclear substances or at a nuclear facility. All NEWs are assigned personal passive dosimeters known as TLDs (thermoluminescent dosimeter). These passive dosimeters measure the whole body and skin doses received in each monitoring period. TLD rings are worn on certain employee's hands for a one-week period each quarter. The test results and the weekly hours of contact are used to estimate the extremity dose for that quarter. TLDs are exchanged monthly, and analyzed by a CNSC licensed external dosimetry service provider. External TLDs worn in November 2021 were extended past their wear period to January 2022 due to vendor challenges. Reported doses are estimated based on the TLD wear dates and reporting dates, to determine fourth quarter 2021 doses. Even if conservatively, the full dose from November 2021 to January 2022 were included in fourth quarter 2021, no actions levels were exceeded. The dosimetry service provider reports the measured doses to BWXT NEC and to the Health Canada National Dose Registry. On receipt, knowledgeable staff reviews the monitoring results, and compares them to associated Internal Control Levels, Action Levels and regulatory limits.

The annual dose assignment for employees at BWXT NEC consists of external and internal dosimetry inputs, for which dose summaries are tracked quarterly, year-to-date, five-year and lifetime. All NEWs who are monitored for radiation exposure receive an annual dose letter identifying their annual dose.

Dosimetry results are summarized in the following sub-sections. Employees are divided into workgroups based on job function for dosimetry analysis and trending. Operators are employees who directly manufacture product. Staff includes management and professional employees who support the operation with the licensed activities.

3.7.9 Total Effective Dose Equivalent (TEDE)

TEDE includes TLD monitored external and calculated internal dose based on workstation air monitoring. Table 13 provides a summary of TEDE dosimetry measurements with monitored workers grouped in various ranges of exposure. Approximately 51% of TEDE are less than 1 mSv. TEDE measurement results by work group are summarized in Table 14. Note that average dose results include zero measurements. The total collective dose for 2021 was 85.73 mSv. The maximum individual five-year dose listed in Table 15 is well below the 100 mSv regulatory limit and the 60 mSv Action Level.

The average annual TEDE trend for all monitored individuals is shown in Figure 4. Average TEDE is trending steady overall. Average and maximum Staff doses remain very low. Job rotation, shielding improvements made in the Sort and Stack, Grinding and Sintering areas are credited with the downward trend in maximum dose over the last several years. Additionally, improvements in ALARA awareness and operator experience are contributors.

Calendar Year	Total # Individuals	Total # of Individuals in Dose Range (mSv)							
		0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500
2021	53	27	24	2	0	0	0	0	0
2020	58	28	24	6	0	0	0	0	0
2019	61	29	28	4	0	0	0	0	0
2018	58	28	26	4	0	0	0	0	0

Table 13: Total Effective Dose Equivalent Distribution

	Year	All Workgroups (TEDE)	Operators External Dose Only	Operators Internal Dose Only	Staff (TEDE)
Maximum (mSv)	2021	5.72	5.21	1.43	0.56
	2020	7.39	6.31	1.64	0.21
	2019	7.17	6.10	1.55	0.72
	2018	9.16	8.07	1.86	2.06
	2017	8.54	8.54	2.37	0.40
Average (mSv/person)	2021	1.62	1.46	0.65	0.07
	2020	1.82	1.74	0.78	0.01
	2019	1.63	1.42	0.76	0.07
	2018	1.74	1.67	0.80	0.12
	2017	1.55	2.41	0.71	0.03

Table 14: TEDE, External and Internal Dose Summary

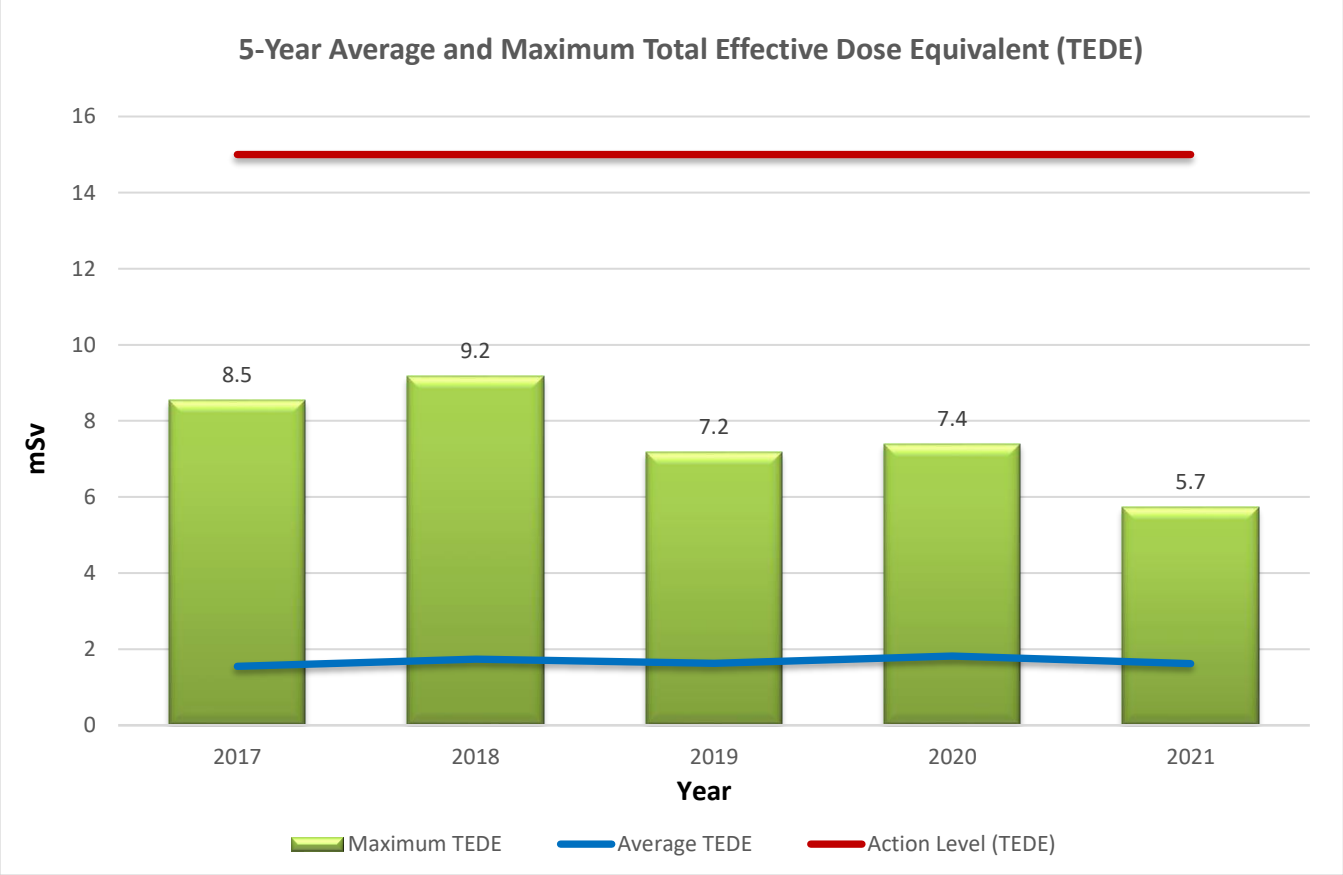

Figure 4: 5-Year Annual Total Effective Dose Equivalent

	Year	All Workgroups
Maximum Individual (mSv)	2021	35.2
	2020	36.6
	2019	38.7
	2018	39.0

Table 15: Maximum Individual 5-Year Dose

3.7.10 Equivalent Skin Dose

TLDs measure the skin doses received in each monitoring period. Skin dose is the measure of the radiation dose that is absorbed by the skin from the deposition of energy from low penetrating radiation.

Table 16 provides a summary of equivalent skin dosimetry measurements with monitored workers grouped in various ranges of exposure. Approximately 42% of skin doses are less than 1 mSv. Skin dose by workgroup is listed in Table 17. The average annual skin dose trend for all monitored individuals is shown in

Figure 5.

Skin doses across all workgroups remain a fraction of the applicable regulatory limit and Action Level. The overall trend is showing that average skin dose is decreasing. The maximum skin dose has decreased in the recent year due to the introduction of job rotation at Sort and Stack. The year over year decrease in overall skin dose has resulted from a combination of job rotation, shielding improvements made in the Sort and Stack, Grinding and Sintering areas and an improvement in ALARA awareness and operator experience. While the primary objective of shielding improvements is reduction in gamma exposures, there is also a reduction in overall beta fields in the work area from the shielding.

Calendar Year	Total # Individuals	Total # of Individuals in Dose Range (mSv)							
		0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500
2021	53	22	8	7	7	9	0	0	0
2020	58	24	10	5	7	12	0	0	0
2019	61	20	14	7	13	7	0	0	0
2018	58	19	9	11	11	6	2	0	0

Table 16: Equivalent Skin Radiation Dose Equivalent Distribution

	Year	All Workgroups	Operators	Staff
Maximum (mSv)	2021	37.19	37.19	1.89
	2020	39.10	39.10	0.87
	2019	39.76	39.76	3.54
	2018	58.36	58.36	8.97
	2017	54.27	54.27	4.43
Average (mSv/person)	2021	7.86	10.08	0.21
	2020	8.88	12.24	0.07
	2019	8.07	10.85	0.27
	2018	8.92	12.68	0.54
	2017	7.85	11.80	0.34

Table 17: Equivalent Skin Dose Summary

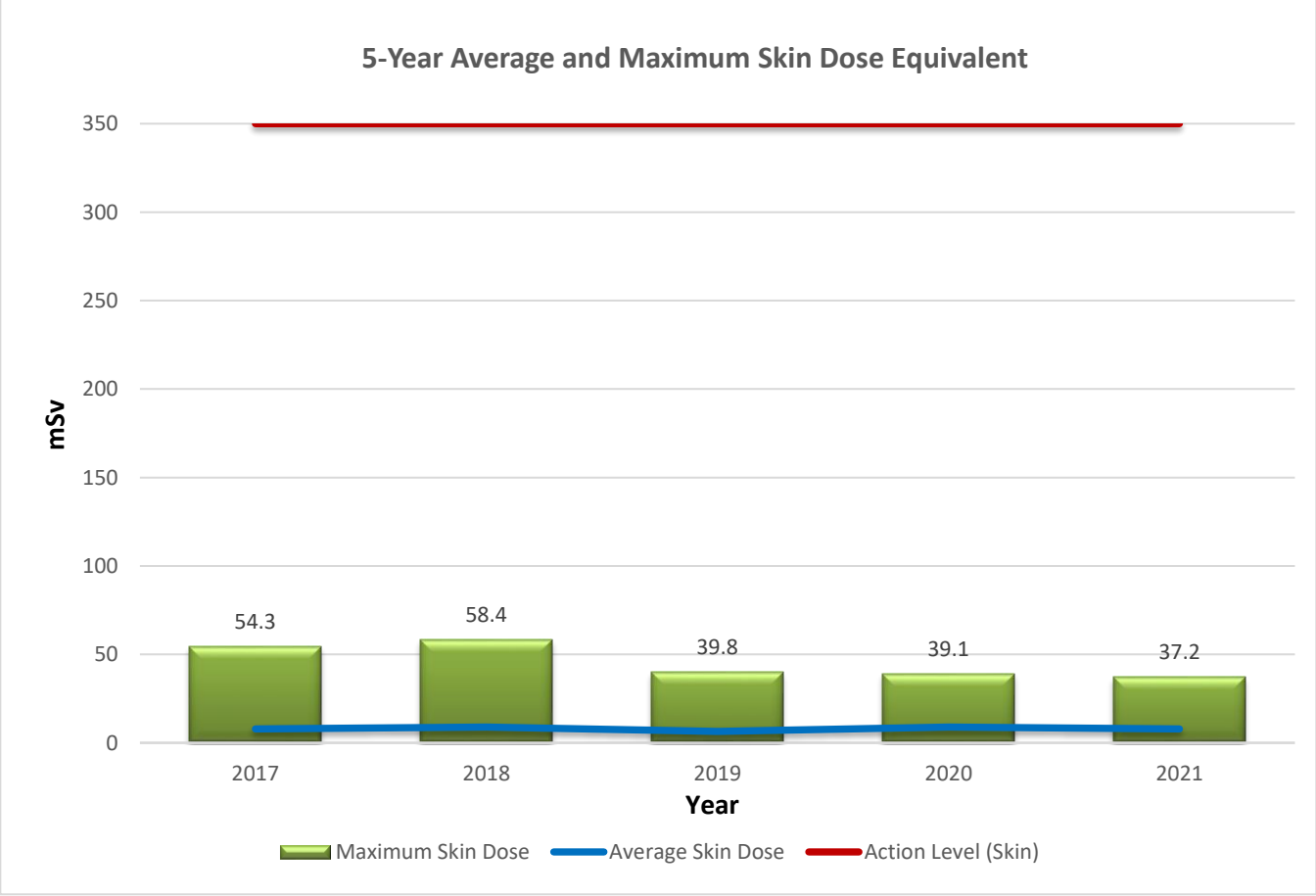

Figure 5: 5-Year Skin Dose Equivalent

3.7.11 Equivalent Extremity Dose

TLD rings are worn on certain individual's hands for a one-week period each quarter to measure extremity dose. A scaling factor is calculated based on hours worked in the quarter and is provided to the dosimetry service provider each monitoring period. The dosimetry service provider applies the scaling factor to the measured dose to estimate the exposure for the quarter.

Table 18 provides a summary of equivalent extremity dosimetry measurements with monitored workers grouped in various ranges of exposure. Approximately 58% of extremity doses are less than 20 mSv. Equivalent extremity dose by work group is summarized in Table 19. Staff do not participate in the extremity monitoring program since there is minimal direct handling of product. The average annual extremity dose trend for all monitored individuals is shown in Figure 6. Average extremity doses continue to remain low.

Calendar Year	Total # Individuals	Total # of Individuals in Dose Range (mSv)							
		0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500
2021	38	5	9	2	6	10	6	0	0
2020	42	2	8	8	7	8	7	2	0
2019	45	2	10	9	8	11	5	0	0
2018	40	0	10	7	6	8	9	0	0

Table 18: Extremity Dose Equivalent Distribution

	Year	All Workgroups	Operators	Staff
Maximum (mSv)	2021	66.06	66.06	N/A
	2020	115.52	115.52	N/A
	2019	79.67	79.67	N/A
	2018	83.33	83.33	N/A
	2017	115.07	115.07	N/A
Average (mSv/person)	2021	22.23	22.23	N/A
	2020	25.37	25.37	N/A
	2019	20.67	20.67	N/A
	2018	24.56	24.56	N/A
	2017	27.36	27.36	N/A

Table 19: Equivalent Extremity Dose Summary

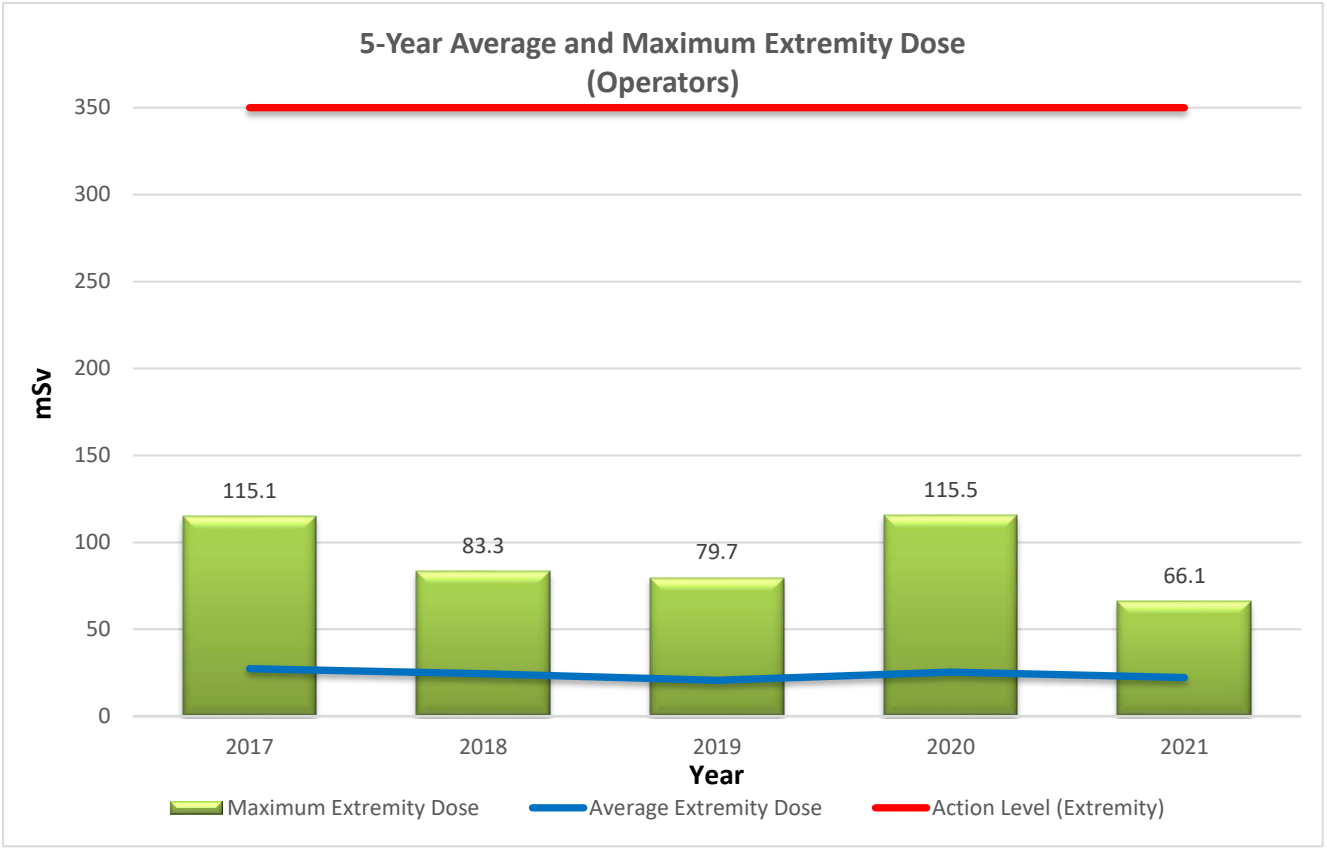

Figure 6: 5-Year Extremity Dose

3.7.12 Total Estimated Doses to Members of the Public

Total effective radiation dose equivalent to members of the public are specified in the Radiation Protection Regulations and listed in Table 11. It is a calculated value, measured in mSv, which takes into account the absorbed dose to all organs of the body, the relative harm level of the radiation, and the sensitivities of each organ to radiation. To ensure compliance with this regulation, BWXT NEC has established “Derived Release Limits” (DRLs) for uranium emissions to the environment. The facility DRLs account for the realistic exposure pathways as described in the radiation protection program to restrict dose to a member of the public to 1 mSv (1,000 µSv) per year, which is the regulatory dose limit. The DRLs assume that a member of the public occupies the BWXT NEC boundary continuously (24 hours per day, 365 days per year). Note: Liquid effluent is not included in the calculation of public dose as the effluent is discharged directly to city sewer systems and is not used for drinking. Through direct correlation with the facility DRLs, the estimated effective dose as a result of air releases is calculated.

In addition, the contribution from gamma radiation emission to the nearest member of the public is calculated from the net sum of the nearest environmental TLD results from all monitoring periods. The calculation conservatively assumes that a member of the public occupies the nearest residence for 66% of their time for the entire year (5,781 hours in a non-leap year).

Over the reporting period, radiation dose to members of the public surrounding BWXT NEC Toronto was a small fraction of the applicable regulatory dose limit as shown in

Table 20 and Figure 7. As a result of Toronto operations, the total estimated radiation dose to a member of the public is 17.5 µSv (0.03 µSv from airborne emissions + 17.2 µSv from direct gamma radiation). In comparison to the 1 mSv (1,000 µSv) per year effective dose limit to a member of the public, doses from the operations is very low at 2%.

Year	Estimated Annual Public Dose (µSv)	% of Public Dose Limit (1,000 µSv = 1 mSv)
2021	17.5	2%
2020	5.7	1%
2019	23.5	2%
2018	0.4	0%
2017	17.5	2%

Table 20: Estimated Radiation Doses to Members of the Public

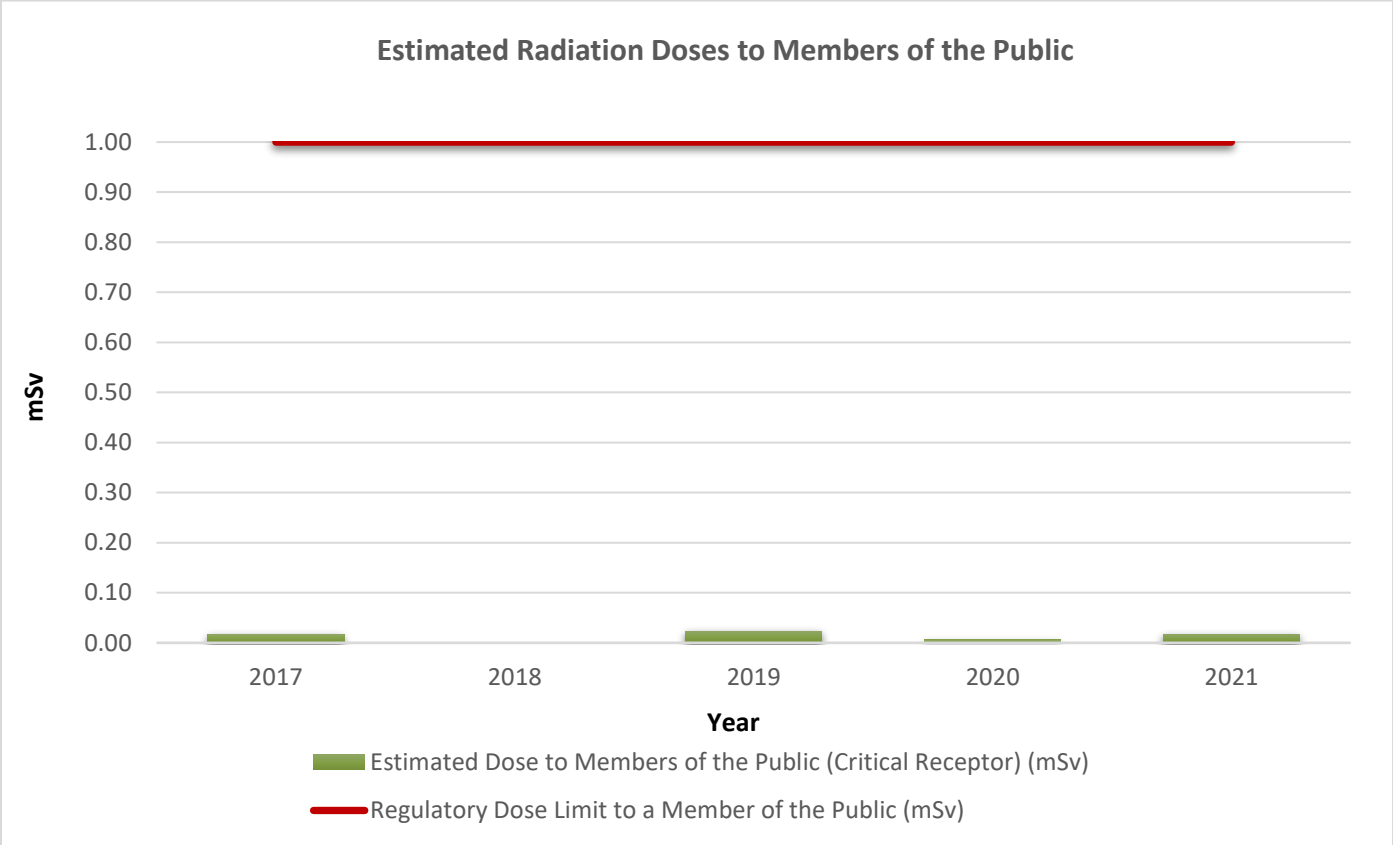

Figure 7: Estimated Radiation Doses to Members of the Public

3.8 Conventional Health and Safety

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

BWXT NEC has a well-established integrated management system for environmental, health and safety program excellence. This is ensured through the effective implementation of program elements. BWXT NEC has an established EHS Mission Statement that is reviewed and signed annually by the President of BWXT NEC. BWXT NEC's objective is to eliminate or minimize as low as reasonably achievable both known and potential environmental, safety and health hazards which could impact our employees and the communities in which they live. EHS is a shared responsibility, top business priority and is continually improved.

Key components of the Health and Safety program include:

- Compliance with all safety and health-related regulatory requirements;
- The setting of EHS goals and objectives;
- Hazard recognition, risk assessment and change control processes;
- A comprehensive worker training program; and,
- Documented safety concerns, near misses and incidents with appropriate root-cause analysis, preventive and corrective actions.

The EHS program includes all worker safety elements that demonstrate compliance to relevant regulations, codes and standards:

- EHS Policy
- Hazard Analysis and Regulatory Compliance
- Employee Involvement
- EHS Specialist
- Accident/Incident Investigation
- EHS Training
- Housekeeping
- Personal Protective Equipment
- Contractor Safety
- Emergency Preparedness/Response
- Risk Assessments
- High Risk Operations
- Industrial Hygiene
- Chemical Management
- Ergonomics
- Lock-Out Tag-Out

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, near miss and incident investigations. The effectiveness of the overall program is reviewed throughout the year and evaluated in the annual management review (section 3.2.3).

3.8.1 Workplace Safety Committee

Eleven meetings were held with quorum. A total of 31 investigations and inspections were conducted in the reporting period. This includes WSC inspections, and near-miss, incident and injury investigations. The WSC inspections led to 142 actions logged and tracked to closure. The top finding categories from WSC inspections were 'housekeeping,' 'equipment safety,' 'personal protective equipment' and 'fire protection.' Established goals for the reporting period are summarized in Table 21.

WSC Goals	Actual	Result
Review two EHS Programs for compliance and improvements by year-end.	2/2	Achieved
Workplace Safety Committee training.	Training completed	Achieved
Conduct joint committee meeting with other EHS teams by year-end.	Meeting held	Achieved

Table 21: Workplace Safety Committee Goals and Results

2022 goals for WSC are established as follows:

1. Review two Safety Risk Assessments for accuracy and proper hazard identification by year-end.
2. Hand Safety / Glove Awareness Campaign.
3. Conduct joint committee meeting with other EHS teams by year-end.

3.8.2 Hazardous Occurrences

Under the Canada Occupational Health and Safety Regulations there are several different types of hazardous occurrences including:

- Minor Injury: any employment injury or an occupational disease for which medical treatment is provided and excludes a disabling injury.
- Disabling Injury: any employment injury or an occupational disease that results in either time loss, or modified duties. Disabling injuries can be either temporary (sprained wrist), or permanent (severed limb), depending on whether or not the employee is expected to make a full recovery.
- Loss of Consciousness: from an electric shock or a toxic or oxygen deficient atmosphere.
- Rescue / Revival or other Emergency Procedures: any incident that requires emergency procedures to be implemented, such as a hazardous substance spill, bomb threat or violence prevention procedure.

Annual reports are provided to the Minister Employment and Social Development Canada as required by regulation.

3.8.2.1 Injuries and Illness

As can be seen in Table 22, BWXT NEC Toronto has had five consecutive years without a Lost Time Injury (LTI).

2017	2018	2019	2020	2021
0	0	0	0	0

Table 22: Lost Time Injuries

There were eleven first aids and one recordable injury (no lost time). Seven out of the eleven injuries involved an injury to the hand or arm. The accident type associated with the injuries varied including 'contact with a sharp object,' 'falls same level' and 'strain.' There were eight near miss events logged following defined event classification criteria. The top three noted categories were 'safety,' 'water' and 'radiation protection.'

3.9 Environmental Protection

The "Environmental Protection" Safety and Control Area covers programs that monitor and control all releases of nuclear and hazardous substances into the environment, as well as their effects on the environment as a result of licensed activities.

BWXT NEC has an effective environmental protection program in place which identifies and controls environmental aspects and drives continuous improvement to enhance performance and minimize risk to employees and the public. The facility has a well-established environmental management system to ensure effective monitoring programs are in place to achieve environmental goals and regulatory compliance. Environmental protection programs are compliant with:

- CSA N288.6-12, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*,
- CSA N288.5-11, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*, and
- CSA N288.4-10, *Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills*.

3.9.1 Environmental Risk Assessment

An Environmental Risk Assessment has been completed in accordance with CSA N288.6-12. The ERA concluded that emissions from the facility were very low and no adverse effects to human health are expected.

The emissions of non-radioactive contaminants from the facility were below the MECP point of impingement (POI) standards; and water releases are also assessed to be minimal. Hence, it was concluded that the emissions of non-radiological substances resulting from the facility pose no adverse effect to human health.

The Environmental Risk Assessments also concluded that emissions of radioactive and non-radioactive materials from the facility pose no adverse effects to non-human biota.

The Environmental Risk Assessment is available on BWXT NEC's public information website: nec.bwxt.com.

3.9.2 Environmental Management System

BWXT NEC has a well-established integrated management system for environmental, health and safety program excellence. This is ensured through the effective implementation of program elements. BWXT NEC has an established EHS Mission Statement that is reviewed and signed annually by the President of BWXT NEC. BWXT NEC's objective is to eliminate or minimize as low as reasonably achievable both known and potential environmental hazards which could impact our employees and the communities in which they live. EHS is a shared responsibility, top business priority and is continually improved.

An Environmental Management System is in place to identify and control environmental aspects and drive continuous improvement to enhance performance and minimize risk to the employees and the public.

Key components of the environmental protection program include:

- Compliance with all environmental-related regulatory requirements;
- The setting of environmental goals and objectives;
- Hazard recognition, risk assessment and change control processes;
- A comprehensive worker training program; and,
- Documented environmental concerns, near misses and incidents with appropriate root-cause analysis, preventive and corrective actions.

The EHS program includes all environmental protection elements that demonstrate compliance to relevant regulations, codes and standards:

- Air
- Water
- Waste
- Dangerous goods shipping
- Facility perimeter / boundary radiation monitoring
- Soil sampling

Continuous improvement is achieved through several review processes, including site inspections, reported concerns, near miss and incident investigations, self-assessments and audits. Environmental goals performance is discussed in 3.9.4. An annual internal self-assessment and audit of the environmental protection program elements is conducted (3.2.1 and 3.2.2). Following these proactive reviews, the findings are documented, corrective actions identified and tracked to completion.

Internal inspections are completed on a routine basis and focus on all areas of the facility. The purpose of these inspections is to identify environmental as well as health and safety issues. WSC members carry out routine site inspections. After an inspection, the findings are documented, corrective actions identified, and submitted to responsible personnel to address. Depending on the complexity of the finding immediate action may be required (i.e. equipment shutdown), or the action may be incorporated into meeting minutes, or tracked in the ATS.

In the reporting period, the In-Duct Sampling and Verification of Sampling Train work instruction was revised for clarity and the Liquid Effluent work instruction was improved with respect to pH requirements. Minor administrative updates were made to three other environmental documents.

Additional verification measures were also implemented for the water effluent process following one reportable incident that occurred during this reporting period.

3.9.3 Effluent and Environmental Monitoring Programs

Small amounts of radiological and non-radiological substances are released to the environment as the result of operations at BWXT NEC. Environmental protection is regulated municipally for water effluent through sewer-use by-laws, provincially for air effluent and federally by the CNSC for both air and water. Airborne and waterborne radiological and non-radiological emissions to the environment are monitored as

part of the effluent monitoring programs. BWXT NEC's effluent and environmental monitoring program is comprised of the following components:

1. Air effluent
2. High-volume ambient air
3. Water effluent
4. Soil sampling

BWXT NEC has established CNSC accepted Action Levels for various environmental parameters. An Action Level is defined in the Radiation Protection Regulations as "specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program, and triggers a requirement for specific action to be taken." Action Levels are also applied to environmental protection. Action Levels are set below regulatory limits; however, they are CNSC reportable events. Accordingly, BWXT NEC has established Internal Control Levels for various environmental parameters that are set even lower than Action Levels to act as an early warning system. Internal Control Level exceedances trigger an internal investigation and corrective actions; however, they are not CNSC reportable events. During the reporting period, there was one reportable event related to water effluent. Effluent water was released to sewer, after it was treated, but before it was sampled, this water was subsequently confirmed to meet release criteria. An investigation and corrective actions were taken for this reportable event. In 2021, BWXT also reported pH values outside of the action level range in 2020 and prior; this information was included in the 2020 annual compliance report.

3.9.3.1 Independent Environmental Monitoring Program

To complement existing and ongoing compliance activities and site monitoring programs, the CNSC implemented its Independent Environmental Monitoring Program to verify that the public and environment around CNSC-regulated facilities are not adversely affected by releases to the environment. This verification is achieved through independent sampling and analysis by the CNSC. This program applies to the BWXT NEC operations. The most recent results are available for sampling conducted in 2021. Results are compared to relevant provincial and federal guidelines and are available on the CNSC website.

3.9.4 Environmental Protection Program Performance

In the reporting period, the installation of an alternate sampling device as requested by the City of Toronto was completed. This activity was related to a previous City of Toronto routine inspection assessing compliance with municipal environmental legislation regarding water emissions. The governing legislation includes the City of Toronto Sewer Use By-Law.

Testing was conducted on the use of filter aid on filter press filters and the subsequent impact on water emission results however; the initiative was not pursued due to the longer filtration time required to achieve desired results.

Environmental protection goals and results are summarized in Table 23.

Environmental Protection Program Goals	Actual	Result
Installation of plant sewer outlet sampling device.	Installed	Achieved
Investigate use of filter aid on filter press filters and impact on water emission results.	Testing Complete	Achieved
Powder recovery from exhaust filters.	Process Established	Achieved

Table 23: Environmental Protection Program Goals

2022 Environmental Protection goals are established as follows:

1. Investigate filtration of waste oil drums.
2. Establish process and dismantle exhaust filters for disposal.
3. Waste Management Program improvements.

3.9.5 Air Effluent Monitoring

BWXT NEC has a valid Environmental Compliance Approval issued by the Ministry of Environment, Conservation and Parks (MECP) for air emissions. In accordance with permit conditions, the site maintains emission summary and dispersion modelling reports and acoustic assessment reports that demonstrate compliance to relevant legislation. An annual summary report is submitted to the MECP. Monitoring of airborne emissions is not required by the MECP. Due to the additional regulation by the CNSC, uranium stack emissions are monitored and compared to CNSC Action Levels.

The facility performs continuous in-stack and facility perimeter air sampling for uranium. In-stack sampling is conducted by drawing a sample of air across a filter capable of trapping uranium dust. The samples are analyzed in-house daily and verified externally by an independent laboratory. Facility perimeter samples are high volume air samples drawn at five positions strategically located outside around the facility perimeter. Facility perimeter samples are analyzed externally by an independent laboratory. In both cases the external independent laboratory tests the filter papers by delayed neutron activation analysis. The minimum detection limit is 0.01 µg uranium. Results are compared to the previous results, and to relevant Internal Control Levels and Action Levels. Measured uranium air emissions are included in the estimated dose to members of the public through direct correlation with facility DRLs. Details are provided in section 3.7.12.

A summary of air effluent sampling results is summarized by stack in Table 24. Results are trended over five years as shown in Figure 8. Air emission concentrations are reported using third party measurements, with exception of the highest value recorded, which is reported as in-house measurements.

The facility perimeter air quality results are summarized in Table 25. The average and maximum facility perimeter air quality monitor results are trended over five years in Figure 9 and consist of very low uranium in air concentrations and well below the Action Level of 0.08 µg/m^3.

Uranium in Air Effluent					
Stack Description	**Emission Contaminant**	**Total Number of Samples**	**Action Level ($\mu g/m^3$) (# Samples Exceeding Level)**	**Highest Value Recorded ($\mu g/m^3$)**	**Average Value Recorded ($\mu g/m^3$)**
Rotoclone	Uranium	251	1.0 (0)	0.197	0.013
6H-68	Uranium	251	1.0 (0)	0.461	0.010
4H-48	Uranium	251	1.0 (0)	0.072	0.012
Furnace #1	Uranium	251	1.0 (0)	0.224	0.029
Furnace #2/4	Uranium	251	1.0 (0)	0.395	0.090
Furnace #5/6	Uranium	251	1.0 (0)	0.250	0.027

Table 24: Uranium in Air Effluent Summary

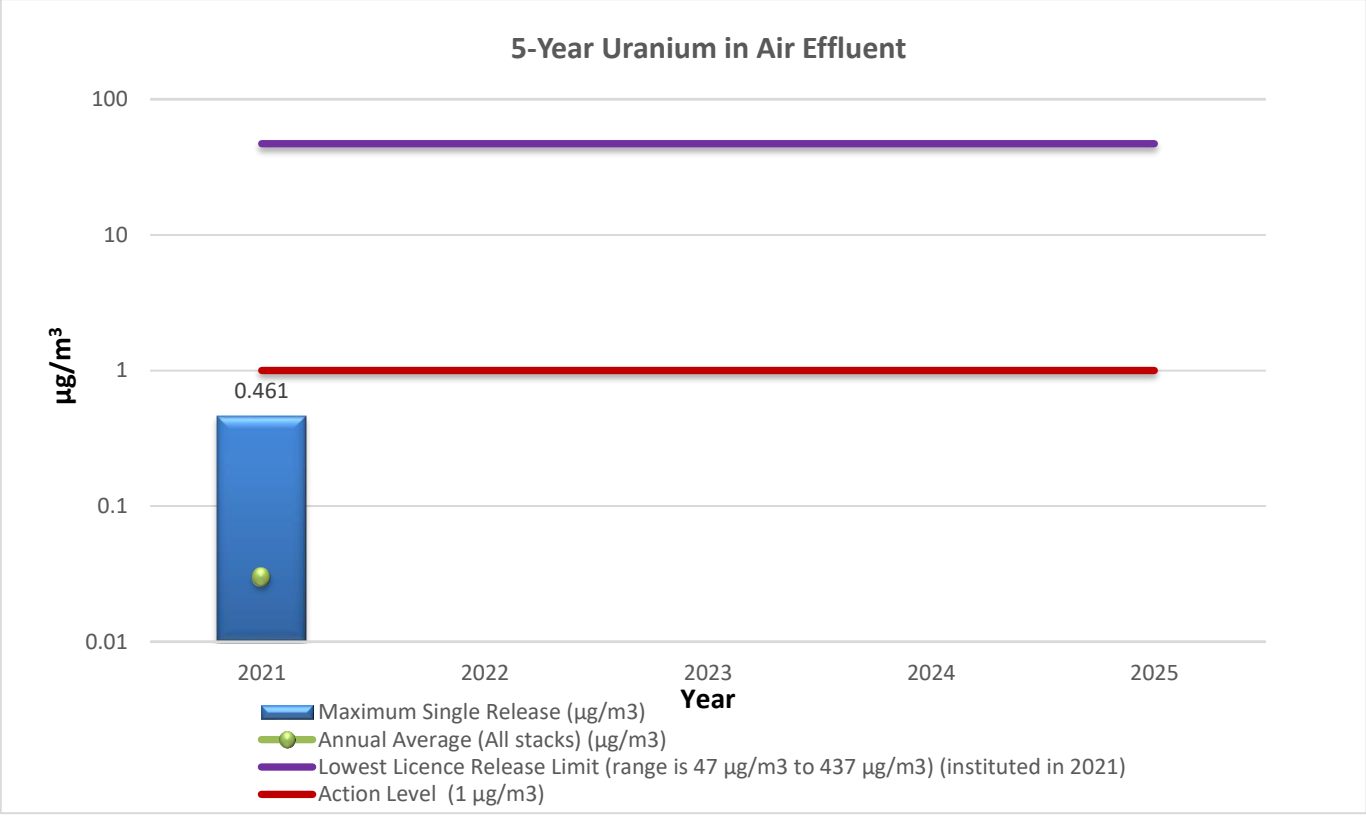

Figure 8: 5-Year Uranium in Air Effluent

Note: the above graph has a logarithmic scale

	2017	2018	2019	2020	2021
Number of Facility Perimeter Air Samples Taken	260	260	260	265	260
Number of Samples > Action Level (0.08 µg/m^3)	0	0	0	0	0
Average Concentration (µg U/m^3)	0.000	0.000	0.000	0.000	0.000
Highest Value Recorded (µg U/m^3)	0.008	0.003	0.001	0.003	0.003

Table 25: Summary of Facility Perimeter Air Monitoring

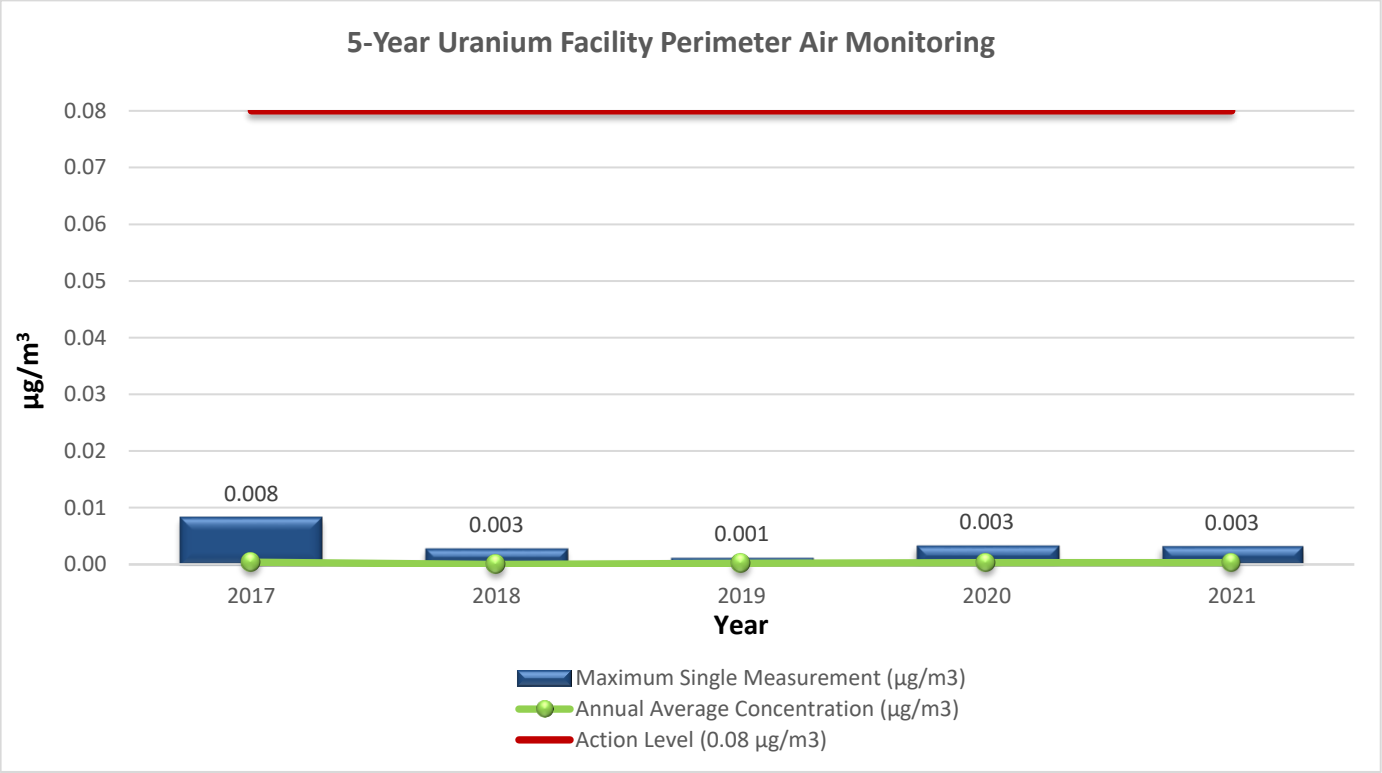

Figure 9: 5-Year Annual Facility Perimeter Air Monitoring

3.9.6 Water Effluent Monitoring

Water is used to clean protective clothing, walls, floors, equipment and in various other janitorial functions. The water is treated to remove UO_2 and the concentration of UO_2 in waste water leaving the treatment system is measured in-house. The concentration of UO_2 in the total waste water leaving the plant premises is calculated and compared to the Internal Control Level of 3 ppm and the Action Level of 6 ppm (per batch). Maximum values reported are calculated from the analyzed in-house samples. In addition, a weekly composite sample is prepared and sent for independent analysis at an accredited external laboratory. The minimum detectable concentration is 0.000001 mg U/L or parts per million (ppm). Averages and annual releases are calculated from the weekly composite samples.

The water effluent treatment system operates as follows:

1. Waste water is held in batches.

2. Each batch is treated, then sampled.
3. Each batch is only released when in-house sample results confirm the concentration is less than 3 ppm (note: The Action Level for a batch is 6 ppm).

Results from water effluent monitoring are summarized in Table 26. Sample measurements are taken at the point of release, prior to mixing with non-process water. Annual discharges for uranium are trended in Figure 10. Total water effluent releases are showing a downward trend. Decreased average uranium concentration at the point of release is attributed to changes in chemical usage for water treatment. Results continue to remain low and below the Action Levels of 6 ppm (per batch) and 3 ppm (annual average).

	2017	2018	2019	2020	2021
Total Amount of Liquid Discharged (L) (from Uranium Processing Areas)	1,140,225	1,295,560	1,232,765	1,493,860	1,368,270
Maximum Uranium Concentration (at the point of release) (ppm)	2.56	2.95	2.58	2.79	2.55
Number of Samples Exceeding Action Level (6 ppm per batch)	0	0	0	0	0
Annual Average Uranium Concentration (at the point of release) (ppm)	1.12	0.72*	0.46	0.24	0.28
Number of Samples Exceeding Action Level (3 ppm annual average)	0	0	0	0	0
Minimum pH	6.6*	7.1	6.5	6.0	6.7
Average pH	7.2	7.6	7.6	7.2	7.4
Maximum pH	7.8	8.7	8.5	8.6	8.6

Table 26: Water Effluent Monitoring Summary

* Value revised from original report.

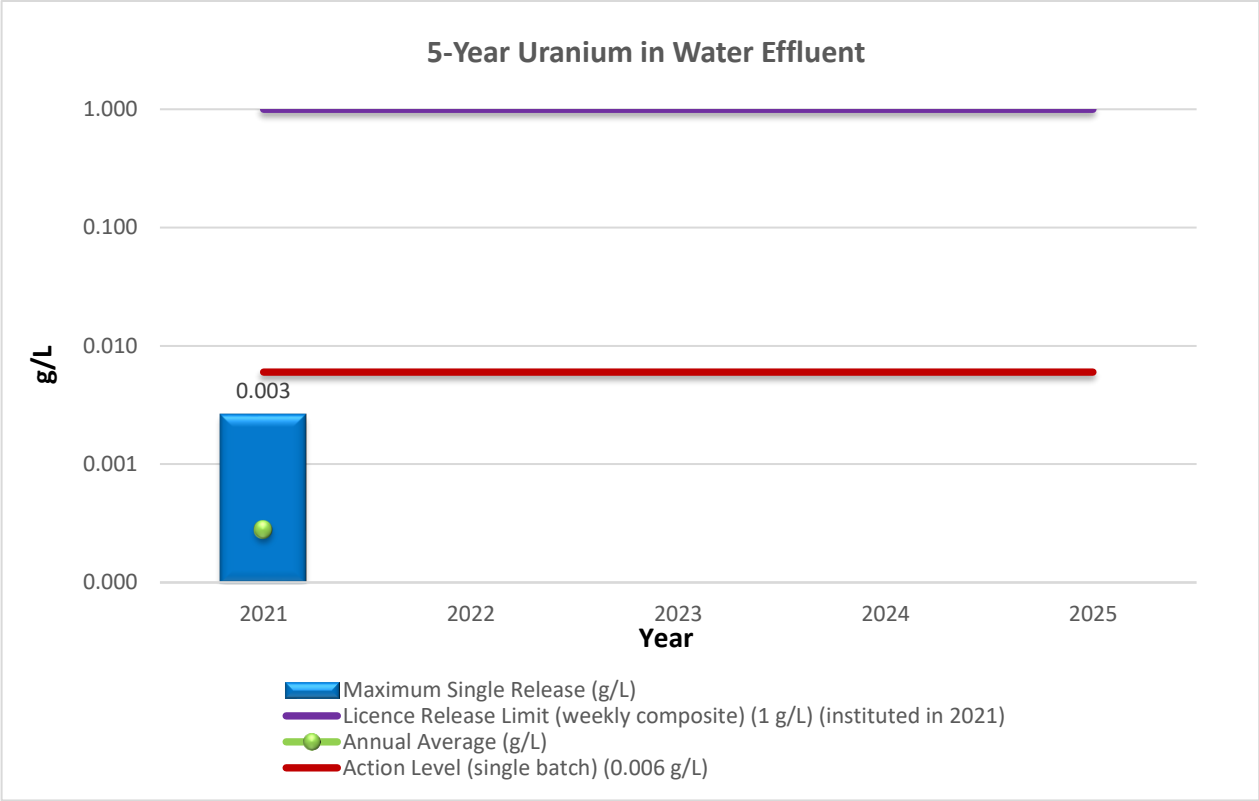

Figure 10: 5-Year Uranium in Water Effluent

Note: the above graph has a logarithmic scale

3.9.7 Soil Sampling Measurements/Monitoring

3.9.7.1 Uranium

Uranium may be detected at low levels in various rocks, ores, soil, water, air and plants. In Ontario, background levels of uranium in soil are generally below 2.5 µg/g (parts per million (ppm)). The Canadian Council of Ministers of the Environment (CCME) have established soil quality guidelines to protect human health and the natural environment. The guidelines represent levels of uranium in soil below which no risk to human health is expected. For residential and parkland land use, the guideline is 23 µg/g; for commercial land use, the guideline is 33 µg/g; for industrial land use the guideline is 300 µg/g. These guidelines have been adopted by the MECP and are listed in Ontario Regulation 153/04. Uranium content in soil at concentrations higher than the MECP standards suggest a need for further assessment, and mitigation of the source of the uranium to eliminate potential exposure and environmental impairment.

Depositions of uranium are measured by taking small samples of surface soil and analyzing for natural uranium. Uranium in soil sampling is conducted annually by a third-party consultant. If soil analysis indicates rising natural uranium levels, emissions may have increased and investigation is made into the cause.

Facility UO_2 air emissions are the primary pathway for potential release into the natural environment by impingement on the ground surface in the immediate vicinity of the facility depending on the wind direction. UO_2 is insoluble in water but may be washed into the soil by rainfall, snow, etc. Surface uranium levels will indicate deposited emissions. Continuous ambient air monitoring units are installed at the perimeter of the facility (boundary air monitors) to verify the effectiveness of the emission control systems. No concerns have been detected regarding release of uranium as sampled at the perimeter/boundary air monitoring units which is consistent with very low emissions as measured at the emission stacks.

In 2021, the sampling plan was modified from previous years due to restricted access to some sampling locations. Samples of surface soil were retrieved from 34 locations in accordance with a documented plan. Due to issues with access to Canadian Pacific Railway property, 33 previously sampled locations were not sampled and 18 alternate samples were taken at new locations in their place. The sampling methodology used is based on the MECP “Guidelines on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario,” December 1996, ISBN-0-7778-4056-1. Annually, the five-year average wind data obtained from Toronto Pearson Airport climate data centre (located approximately 12 kilometers west of the facility), is reviewed and used to confirm the appropriateness of the selected soil sampling locations. The data shows prevalent winds from north to south-west. Three quality control soil samples at a background location approximately 15 km north of the facility are also taken, along with three blind duplicate samples for field quality control purposes. The soil samples are stored in a cooler with ice and transported the next day for analysis at an independent accredited laboratory by Inductively Coupled Plasma Mass Spectrometry for uranium content. The minimum detectable concentration is 1.0 part per million (1.0 µg U/g). Results are compared to previous years and the CCME guidelines. A summary of results taken in the reporting period is listed in Table 27.

	Location Description		
	On BWXT NEC property	**On industrial/commercial lands, i.e. south rail lands**	**All other locations, i.e. residential**
Relevant CCME Guideline (µg U/g)	**300 µg U/g**	**33 µg U/g**	**23 µg U/g**
Number of Samples Taken	3	2	29
Average concentration (µg U/g)	2.4	1.0	1.0
Maximum concentration (µg U/g)	4.6	1.0	1.1

Table 27: Soil Sampling Result Summary

The analytical results show a range of concentrations from <1.0 µg/g to 4.6 µg/g with 33 sample locations having reported uranium concentrations below the Ontario background concentration of 2.5 µg/g. These results are without exception well below the acceptable standard published by the MECP under Ontario Regulation 153/04 and CCME soil quality guideline. Based on the analytical results of the sampling program, there is no evidence to suggest that uranium used at the BWXT facility has had a negative impact on Toronto soils. No safety risk associated with the presence of uranium has been identified to the public in the community surrounding the BWXT NEC facility.

3.10 Emergency Management and Fire Protection

The emergency preparedness and fire protection programs are well-established and effective. The facility has established an emergency plan that describes the actions to be taken to minimize the health and environmental hazards, which may result from fires, explosions, or the release of hazardous materials. The plan includes effects to the local area and members of the public. The plan is intended to reduce the risk of fires within the facility and assist emergency staff and plant personnel in understanding key emergency response issues, and assist the facility in protecting employees, the local community and the environment through sound emergency management practices. The emergency plan is developed in accordance with standards and meets the CNSC operating licence requirements.

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, near miss and incident investigations, drills and self-assessments. Non-conformances are tracked to closure.

One event activated the Emergency Organization during the reporting period. In response to a site wide power failure, the decision was made to activate the Emergency Organization, and the CNSC was notified.

Three other events occurred in the period. In the first, dust generated from contractor activities on the plant compressor triggered a fire alarm and subsequent response from Toronto Fire Services. The second and third events were the result of a partial power-failure which shut down a portion of the exhaust ventilation system. Employees evacuated the shop floor, and once power was restored, the operation of the ventilation system was verified and production resumed.

3.10.1 Emergency Preparedness Program Activities

The facility continued with program improvements, which focused on cross training and drill management. There were a number of improvements recommended as a result of drills in the areas of emergency equipment, communication, and emergency procedures.

Emergency preparedness training is achieved through response drills where actual responses are regularly critiqued to continually improve the effectiveness of the process. These are conducted at least annually. All employees are trained on established fire prevention measures, emergency situation responses, emergency evacuation routes and their responsibilities. Awareness training is conducted during new employee orientation and refreshed through response drills. On-site emergency responders are provided with the level of training necessary to allow them to effectively perform their designated functions as defined in the facility training matrix. Training course completion is summarized in Table 4: .

Tests of the emergency plans were performed in the following areas:

1. Fire safety/evacuation (five)
2. Loss of power (three)
3. Hazardous materials transportation (one)

3.10.2 Fire Protection Program Activities

The Fire Protection program describes the systems and resources available to prevent and detect fire and to minimize impact from a fire event and consist of the following key elements:

Fire and Life Safety Features;

- Inspection and Maintenance;
- Fire Protection Assessment;
- Fire Protection;
- Housekeeping;
- Minimization of Combustibles;
- Ignition Source Control;
- Impairment;
- Design for the Prevention and Mitigation of Fires;
- Training;
- Outside Coordination; and,
- Program Assessment.

The documented fire hazards analysis (FHA) identifies the facility fire hazards and their potential impact on worker and public safety, and asset protection.

The facility maintains a documented fire safety plan that is developed in accordance with the National Fire Code of Canada, the National Building Code of Canada and CSA N393-13, *Fire protection for facilities that process, handle, or store nuclear substances*. The fire safety plan is based on the documented FHA and ensures that measures are appropriate to the facility. It provides information on resources in the buildings, emergency procedures and actions to be taken in the event of a fire. It includes training, duties

of designated personnel, details of maintenance procedures and fire protection measures. The information assists the occupants in utilizing life safety features in the buildings, ensures an orderly evacuation at the time of an emergency and provides a maximum degree of flexibility to achieve the necessary fire safety for the buildings.

Fire protection systems are inspected and tested in accordance with the National Fire Code of Canada following an established schedule. A third-party review and internal self-assessment is conducted annually. Identified continuous improvements are tracked to completion using the ATS.

During the reporting period, BWXT NEC continued to work with Toronto Fire Services to establish a clear basis for contingency response planning between the organizations to deal with fire and rescue emergency situations. This included the successful completion of one emergency response drill. An Emergency Response Exercise team was formed to plan and prepare for the next CNSC witnessed exercise.

The program facilitates effective communication and exchange of relevant information, and assures timely, reliable, and effective decision-making and response actions. Site hazard reviews and site familiarization tours are scheduled annually with Toronto Fire Services. Unfortunately, the site familiarization tours were not able to take place in 2021 due to pandemic restrictions. These tours are planned for 2022.

A review of Fire and Life Safety System Impairment procedures was completed. The National Fire Code and *CSA N393-13, Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* were reviewed for impairment procedure requirements against existing documentation and a stand-alone document was created.

Physical plant changes are periodically made to improve the fire protection program. Minor changes to improve the fire protection program were completed including relocating lighting interfering with sprinkler heads, upgrading some emergency lighting to LED, and the repair of damaged fire separations (i.e. fire stopping openings and ceiling tile replacement).

3.11 Waste Management

The "Waste Management" 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 Safety and Control Area also covers the ongoing decontamination and planning for decommissioning activities.

Radioactive wastes are any materials that contain a nuclear substance, and which have been declared to be waste. BWXT NEC has an effective and well-established radioactive waste disposal program that ensures all radioactive waste disposals are compliant with the Nuclear Safety and Control Act and associated regulations and the facility operating licence conditions. Radioactive waste generated from fuel manufacturing, which consist of, or are contaminated by uranium are accumulated in controlled and classified areas. These are compacted for volume reduction where possible, and shipped routinely to a licensed radioactive waste disposal facility. Only about 0.1% of the uranium that is processed ends up in waste streams. Nearly all nuclear material is used in the product or recycled back to the supplier.

Waste management and generation details are further described in Appendix B, submitted to the CNSC separately.

BWXT NEC maintains a preliminary decommissioning plan (PDPs) and financial guarantee in accordance with CNSC Regulatory Guide G-219 Decommissioning Planning for Licensed Activities, CNSC Regulatory Guide G-206 Financial Guarantees for the Decommissioning of Licensed Activities, and CSA N294-09 Decommissioning of Facilities Containing Nuclear Substances. The PDP strategy and end-state objective of decommissioning is to release the site from regulatory control for industrial use or demolition

of the structures. The PDP is reviewed at least once every five years. No changes were made to the PDP during the reporting period.

3.12 Security

The "Security" Safety and Control Area covers the programs required to implement and support the security requirements stipulated in the regulations and in the operating licence.

The facility maintains a security program in accordance with the General Nuclear Safety and Control Regulations, Class I Nuclear Facilities Regulations, and the Nuclear Security Regulations. The security program outlines the systems, processes and responsibilities for performing security operations with the objective of maintaining safe and secure facilities. The program manual identifies the individual responsibilities for implementation and maintenance of the program. The manual includes instructions for administering the security program, provides the basis for security protocols and identifies the controls in place to meet regulatory requirements. Program details are prescribed information and confidential. Examples of security measures in place at both facilities include:

- Access control (access cards and locked restricted-access areas);
- Facility Access Security Clearance program;
- Security guards;
- Security barriers;
- Intrusion detection systems; and,
- Preventing the unauthorized removal of nuclear material.

3.13 Safeguards and Non-Proliferation

The "Safeguards and Non-proliferation" 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. BWXT NEC has implemented and maintains a safeguards program and undertakes all required measures to ensure safeguards implementation in accordance with IAEA commitments and CNSC regulatory document 2.13.1 *Safeguards and Nuclear Material Accountancy (which superseded RD-336 Accounting and Reporting of Nuclear Material)*. Movement of safeguarded nuclear material (inventory changes) are documented and reported to the CNSC as required.

BWXT NEC has implemented and maintained a well-established Safeguards program throughout the licence period and undertakes all required measures to ensure IAEA commitments and CNSC regulatory requirements are met. BWXT NEC reports all Inventory Change Documents for both facilities through the Nuclear Materials Accountancy Reporting system.

The Physical Inventory Taking, was conducted on July 29th. Physical Inventory Verification and Design Information Verification involving the CNSC and the IAEA followed on July 30th. The scope of the Physical Inventory Verification concerned book examination, physical verification of nuclear material and evaluation of the quality and performance of BWXT NEC's measurement system. The scope of the Design Information Verification concerned verification of the facility, general building design, essential equipment, accounting procedures, operator's measurement system, nuclear material characteristics, nuclear material location & flow and operational status of the facility. Short Notice Random Inspections were conducted by the IAEA on March 15th and November 15th. The inspections involved physical examination of powder drums and scrap drums with pellet and powder samples taken for further analysis by the IAEA. No non-conformances were noted.

3.14 Packaging and Transport of Nuclear Substances

The "Packaging and Transport of Nuclear Substances" Safety and Control Area covers the packaging and transport of nuclear substances and other nuclear materials to and from the licensed facilities. In the reporting period, all packaging and shipments to and from both facilities were conducted safely according to applicable regulations. Shipments of dangerous goods are not routinely made from BWXT NEC by air, rail or water. Routine road shipments of both dangerous goods and non-dangerous goods are made between suppliers, the Toronto plant, the Peterborough plant and customer nuclear generating stations. Shipments of prescribed substances are only made to:

- Persons in Canada, holding a valid CNSC Licence to possess such prescribed substances; or,
- Persons in Canada, not requiring a valid CNSC Licence by virtue of the Nuclear Safety and Control Act and regulations; or,
- Persons outside Canada, as approved by an Export Permit, CNSC Export Licence, or combination of CNSC Export Licence and reference to General Export Permit as applicable.

The transportation of dangerous goods in Canada is regulated by Transport Canada through the Transportation of Dangerous Goods Regulations. Additional requirements for the transport of Class 7 radioactive materials is regulated by the CNSC through the Packaging and Transportation of Nuclear Substances Regulations. In addition, the IAEA has established uniform regulations for all modes of transportation throughout the world. The IAEA has published the Regulations for the Safe Transport of Radioactive Material and the CNSC has endorsed these through the Packaging and Transport of Nuclear Substances Regulations.

BWXT NEC has an established Emergency Response Assistance Plan compliant to Part 7 of the Transportation of Dangerous Goods Regulations. During the reporting period, the plan was revised and approved by Transport Canada. It is in place to ensure that timely and effective response protocols are in place with the intent to protect public safety, property and the environment in the event of an accident involving the transportation of natural or depleted UO_2. A tabletop emergency drill was completed to test elements of the transportation emergency plan with continuous improvements identified and tracked to completion. Transportation of uranium materials to and from BWXT NEC are included in the plan.

4 OTHER MATTERS OF REGULATORY INTEREST

4.1 Public Information Program

Employee/Internal Communications

BWXT NEC uses a variety of means to engage its ~60 employees in Toronto. The company uses the employee portal (intranet), electronic bulletin boards, email alerts and printed communications to issue company news, executive blogs and general business updates. The president of BWXT NEC normally holds all-employee meetings at all sites in the fourth quarter of the year. Due to the COVID-19 pandemic, this meeting was recorded and shared with employees virtually. Open communication is important to the president of BWXT NEC and he encourages employees contact him throughout the year with questions.

Government Stakeholders

BWXT NEC places great importance on its relationships with all levels of government in the communities in which it operates and works to ensure there is open communication and awareness of BWXT NEC's operating activities. In 2021, BWXT NEC emailed over ten electronic updates to the MP and MPP for Davenport and the Councillor for Davenport. These communications provided elected officials in Toronto with information about the CNSC's Record of Decision from the licence renewal, invitations for tours, meetings and virtual community events, relevant information and links, and copies of newsletters and

other documentation. In 2021, no facility tours were conducted with elected officials in Toronto due to the pandemic. Virtual meetings were held with the MPP for Davenport and the Councillor for Davenport's office. In 2021, BWXT NEC responded to a phone call from the office of the MP of Davenport and sent a re-election congratulatory letter with an offer to meet.

Indigenous Relations

BWXT Canada (which includes BWXT NEC) has been a member of the Canadian Council for Aboriginal Business (CCAB) since September of 2017 and is currently Progressive Aboriginal Relations (PAR) Certified at the committed level. This signifies BWXT Canada's commitment to continuous improvement in Indigenous relations and intention to undergo external verification of performance in the future.

BWXT Canada's Indigenous Relations Committee meets regularly to review objectives outlined in the PAR criteria as the company works to find ways to strengthen its ties with Indigenous communities. In 2021, BWXT NEC contacted its local Indigenous communities in Toronto via email and a letter offering to meet. These communications provided information about the CNSC's Record of Decision from the licence renewal, invitations for tours, meetings and virtual community events, relevant information and links, and copies of newsletters and other documentation.

The company is also an active member within the Indigenous Relations Suppliers Network established by Bruce Power and Indigenous Opportunities in Nuclear program established by Ontario Power Generation. In November, BWXT NEC sponsored the Métis Nation of Ontario's Annual General Assembly. Overall, the CCAB PAR program supports BWXT NEC's commitment to engaging with Indigenous communities and working together to build and sustain meaningful long-term relationships. More information on BWXT NEC's commitment to Indigenous relations, including our policy, can be found at nec.bwxt.com under the Community tab.

Community Relations

BWXT NEC is committed to providing timely information to the communities in which it operates and works to ensure there is open two-way communication and awareness of BWXT NEC's operating activities. Throughout 2021, BWXT NEC utilized a variety of communication channels to provide information to its neighbours, including electronic email updates to its contact list (which includes interested members of the public), banners along the fence line, newsletters, mailers, social media and Facebook targeted advertising. Community members can sign up to join BWXT NEC's email updates anytime by contacting the company at questions@bwxt.com.

Community Volunteerism

With the COVID-19 pandemic pausing most in-person volunteering events, BWXT NEC's employees remained committed to supporting their community through charitable giving. In 2021, Toronto employees contributed to a spring fundraiser for Oasis Dufferin Community Centre and an employee volunteered at the Bruce Power/Region of Peel Vaccination Hub in Brampton.

Community Investment

In Toronto, BWXT NEC made charitable contributions to the Toronto District School Board's Western Technical Commercial School for both their FIRST Robotics Program as well as two bursary awards for students continuing education in a STEM field. BWXT NEC also made charitable contributions to the Davenport-Perth Neighbourhood and Community Health Centre, Ontario Tech University, and Oasis Dufferin Community Centre.

Tours

BWXT NEC provides facility tours to help engage members of the industry, local elected officials, Indigenous communities and interested members of the public in an effort to help better understand our business. Due to the COVID-19 pandemic, no facility tours occurred. BWXT NEC created a virtual tour of its Peterborough facility, which is posted on its website and looks forward to doing so in Toronto when it is safe to do so.

Community Events

Due to the COVID-19 pandemic, BWXT NEC chose to again cancel its annual in-person community barbeques. A Community Webinar was held on October 5, 2021 in the evening. The webinar provided a means to engage neighbours, community members and other stakeholders, and to educate them about our business. There were 27 participants on the live webinar and BWXT NEC representatives answered questions for over 30 minutes. The webinar recording is available on BWXT NEC's public website (nec.bwxt.com). The webinar was staffed by BWXT NEC leadership who presented an informative slideshow containing information about the company, safety and compliance, public information program, licence renewal, and facts about natural uranium. Throughout the webinar, viewers could submit their questions in the comment section and BWXT NEC would address these questions live in the video feed. BWXT NEC included invitations to the Community Webinar in mailers sent to neighbours, on the dedicated website, on social media and additionally used targeted Facebook advertising to share the invitation details.

Community Newsletters

BWXT NEC distributes by mail, and posts to its website, community newsletters as a tool to share information with the local Toronto community about the company's operational performance, health and safety, CNSC licence, activities in the community and general information. Three newsletters were mailed to the Toronto surrounding community in February, June and December of 2021. The newsletters were also posted to our public information website, emailed to our contact list and shared on social media. Toronto newsletters are additionally translated to Portuguese on the website and included in mailings.

Community Liaison Committee - Toronto

The Toronto CLC was established in 2013 and meets three to four times per year. In 2021, all meetings were held virtually due to the pandemic (normally meetings are held in-person at the Toronto BWXT NEC facility in the evenings). The CLC is a forum for the exchange of information between the community and BWXT NEC and allows members to bring forward questions, discuss concerns and identify opportunities to improve community relations.

BWXT NEC held a new member orientation session on March 2nd and subsequently met with the CLC on April 13th, June 28th, September 21st and held a year-end meeting on November 25th. Meeting records are posted to the company's website. In 2021, CLC members virtually met with BWXT NEC staff to discuss the facility's operations and received updates on topics such as the CNSC's Record of Decision, Annual Compliance Report, emergency exercises and program, public disclosure protocol, public surveying, community updates, environmental monitoring information, safety scenarios, public information program updates, events, community outreach and support, media coverage, community opposition groups, CLC recruitment, and more.

A representative from the CNSC attended the September CLC meeting in 2021 as a guest. Additionally, to provide more information on safety scenarios, two guest speakers from Arcadis attended the June meeting and another guest speaker from Arcadis joined the September meeting.

In 2021, the CLC had a membership of twelve external members (including a representative from an environmental non-government organization, representative from a local first responder organization and

a representative of a local community health organization). One member left the CLC mid-year due to location change and two members were participating in their final year on the CLC. BWXT NEC launched a recruitment campaign in the fall of 2021 to attract new members for which four applications were received. Three applicants were accepted upon review and will join the committee in 2022.

Website

BWXT NEC has a dedicated public information website, located at nec.bwxt.com. The website provides information about the company's operations and activities that can be accessed by members of the public and other key stakeholders 24/7.

In 2021, there were 14,621 sessions from 12,018 users. Top pages visited were: Home page (34%), About Peterborough (12%), About Us (7%), Contact Us (5%), About Toronto (4%) About Arnprior (3%) and News (3%).

Over the course of 2021, new information was regularly updated on the website. The following represents some of the updates that were posted:

- Licence renewal updates (Record of Decision)
- Public disclosures
- Document summaries and environmental information
- Frequently asked questions
- Peterborough and Toronto CLC (meeting minutes, recruitment)
- Copies of the Toronto (three) and Peterborough (three) newsletters
- Community Webinar information
- Virtual Tour (Peterborough)
- Annual Compliance Report information
- Notice of CNSC's annual public meeting and webinar

Information Brochures

BWXT NEC maintains public information brochures. These brochures are updated on a yearly basis when new information is available from the Annual Compliance Report. These brochures are available in Toronto during tours and meetings and are also posted on our public website. Brochures are used as information tools at community events like job fairs and community barbeques.

Public Inquiries

Members of the public can contact BWXT NEC by dialing our toll-free number, 1.855.696.9588 and/or emailing us at questions@bwxt.com. These contact details appear on BWXT NEC's website and in community newsletters and public information brochures. In 2021, 682 emails were received by questions@bwxt.com, the majority of which were spam, questions for finance or purchasing, job seekers or agencies seeking employment verifications. BWXT NEC did notice a decrease in questions from the public via emails and phone calls since 2020. We encourage community members to use this outlet to contact us with questions, comments and concerns. In 2021, there were 181 calls to the 1.855.696.9588 toll free number, most of which were related to employment verification, procurement, community giving or public/media relations. All emails and calls to the information line were appropriately handled and addressed.

Earned Media

BWXT NEC was mentioned in one Toronto news article in 2021. The article tone was negative and reflected concerns from community members on pelleting, fuel, CNSC concerns, and NWMO concerns.

Social Media

In October of 2020, BWXT NEC launched its own dedicated Facebook and Twitter social media platforms to better engage with its community members. Social media channels help BWXT NEC share information about activities with the public in a timely way. In 2021, BWXT NEC issued two to four social media posts each week on Twitter and Facebook. Post topics include information about BWXT NEC's operations, invitations to events, job postings, community giving and involvement, CLC recruitment, educational information, industry highlights, and more.

Public Disclosure Protocol

BWXT NEC has a Public Disclosure Protocol in place that sets guidelines for providing timely information to interested members of the public and other stakeholders. This Protocol and any Public Disclosures issued by BWXT NEC can be found at nec.bwxt.com under the Community tab. The Public Disclosure Protocol document is also available in full on the website as a PDF. There were two public disclosures made in 2021. One was for a false fire alarm that was accidentally activated during maintenance on a compressor (no health or safety risk posed to the public, environment or employees) and the other was to inform the public about sewer construction work being done by the City of Toronto which could involve sidewalk and lane blockages.

4.2 Cost Recovery

BWXT NEC is current on its cost recovery payments to the CNSC.

4.3 Financial Guarantees

A PDP and associated decommissioning cost estimate are in place in accordance with CNSC Regulatory Guide G-206 Financial Guarantees for the Decommissioning of Licensed Activities, CNSC Regulatory Guide G-219 Decommissioning Planning for Licensed Activities, and CSA N294-09 Decommissioning of Facilities Containing Nuclear Substances. The PDP strategy and end-state objective of decommissioning is to release the site from regulatory control for industrial use or demolition of the structures.

On December 22nd, 2020 the CNSC in its relicensing decision accepted the proposed financial guarantee amounts and financial instruments which replaced the existing letter of credit in the first quarter of 2021. The annual financial rating of the surety bond issuer was provided to the CNSC in January of 2021.

4.4 Improvement Plans and Future Outlook

BWXT NEC remains committed to continuously improve its EHS programs to improve efficiency and minimize risk to employees, the public and the environment. Facility operations are projected to remain consistent in 2022. Fuel production levels are projected to be similar to the amount processed in 2021.

The following improvements are planned for the next year:

- Update elements of the Emergency Plan.
- Conduct a full-scale emergency exercise.

5 CONCLUDING REMARKS

BWXT NEC is committed to the establishment and continuous improvement of a healthy safety culture. Safety culture refers to the core values and behaviours resulting from a collective commitment by our company's leaders and individuals to emphasize safety, quality, ethics, and security over competing goals to ensure protection of employees, the public and the environment. It is a top business priority to continuously improve our EHS systems to protect fellow employees, the environment, and our communities against environmental, health and safety hazards. BWXT NEC management recognizes, reviews, prioritizes and controls workplace hazards and ensures compliance with applicable regulatory requirements, applicable codes and company policies.

Governed by an integrated management system, conventional health and safety, radiation protection and environmental protection programs are well implemented. All radiation dose measurement results were below Internal Control Levels, Action Levels and regulatory limits. Environmental protection programs are well implemented. There were two reportable events during the reporting period, with no risk to the public or the environment. Facility emission results were very low and below Internal Control Levels, Action Levels and regulatory limits. Annual releases to the air and water were both a very small fraction of regulatory limits. Public dose was a small fraction of the public dose limit.

All production and possession limits were respected. Transportation of dangerous goods was conducted safely between suppliers, customers and waste vendors without risk to workers, the public or the environment.

This annual compliance monitoring and operational performance report demonstrates that BWXT NEC has successfully met the requirements of the Nuclear Safety and Control Act, regulations and CNSC Class IB Nuclear Fuel Facility Licence requirements.