



**2023 Fourth Quarter Compliance Monitoring  
&  
Operational Performance Report**

**Reporting Period October 1 – December 31, 2023**

**Port Hope Conversion Facility  
Operating Licence  
FFOL-3631.00/2027**

**One Eldorado Place  
Port Hope, Ontario  
L1A 3A1**

Submitted to:  
**The Canadian Nuclear Safety Commission**  
P.O. Box 1046, Station B  
280 Slater Street  
Ottawa, Ontario  
K1P 5S9

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## **I Executive Summary**

Cameco Corporation (Cameco) is committed to the safe, clean, and reliable operation of all its facilities and continually strives to improve its performance and processes to ensure the safety of both its employees and local residents. The Port Hope Conversion Facility (PHCF) maintains the required programs, plans and procedures in the areas of health and safety, radiation protection, environment, emergency response, fire protection, waste management, and training.

As a result of these programs, plans and procedures, the PHCF has maintained radiation exposures to workers and the public well below the regulatory dose limits. Environmental emissions are also being controlled to levels that are a fraction of the regulatory limits.

Cameco utilizes administrative levels and action levels to provide early detection of issues and ensure levels remain well below regulatory limits. A variety of control measures and practices are employed as part of site programs to ensure the protection of the public, site employees and the environment. A robust ALARA program is in place to ensure continual improvement and to ensure exposures and emissions remain well below action levels.

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## 1.0 Fourth Quarter Overview

### 1.1 Facility Operation

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

There were no significant changes to Structure, Systems and Components (SSC) or processes in the fourth quarter.

On October 6, 2023, Cameco reported to the Ontario Ministry of Environment, Conservation and Parks (MECP) an ambient station high volume air sampler (hi-vol) exceedance of 179  $\mu\text{g TSP}/\text{m}^3$  total suspended particulate (TSP) for the period of October 4-5, 2023, at the Marsh Street Hi-Vol station. The measurement was above the ECCC and MECP 120  $\mu\text{g}/\text{m}^3$  TSP dust criteria for visibility and was attributed to construction work immediately adjacent to the hi-vol station.

On October 16, 2023, non-chlorinated water was able to enter the storm sewer system in relation to structure removal hot work taking place at Building 27. Initially the water was thought to be chlorinated which prompted reporting of the event to the MECP and CNSC. The water was later determined to be non-chlorinated and therefore, no impact to the environment.

On October 25, 2023, a contractor was assigned an effective dose of 8.6 mSv in relation to an exposure that occurred during an abnormal event on September 14, 2023, in the UO<sub>2</sub> plant. The action level for lung counting is 5 mSv which was exceeded in this dose assignment.

On December 6, 2023, Cameco was informed of contamination on a lid of a roll-off bin that was transported December 4, 2023, from the PHCF to the Long-Term Waste Management Facility. The lid was decontaminated and transported back to the PHCF. Due to the location on the lid, no contamination left the bin during transport.

The UF<sub>6</sub> plant operated throughout the fourth quarter without interruption and continued operating through the holiday period into the new year. The UO<sub>2</sub> plant operated in the fourth quarter without interruption. The UO<sub>2</sub> plant was shutdown December 21 for the holiday period and restarted January 3, 2024.

## 1.2 Physical Design / Facility Modification

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

At the PHCF, changes to the physical design of equipment, processes, and the facility with the potential to impact safety are evaluated using the internal design change process described in *Process and Design Change Control, CQP-113*. Changes are reviewed through Cameco's management of change workflow, which ensures all potential impacts to the environment as well as to the health and safety of personnel are evaluated prior to implementation.

## 2.0 Radiation Protection

This safety and control area covers the implementation of a radiation protection program, in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses are monitored and controlled. Cameco manages its Radiation Protection Program at the PHCF using ALARA principles in order to ensure doses are maintained well below regulatory limits.

There were no radiation dose action level exceedances in Q4 2023.

### Whole Body Dose

Table 1 shows the whole-body dose summary results from Q4 2023 for six work groups: UF<sub>6</sub> Plant; UO<sub>2</sub> Plant; Maintenance; Technical Support (including Nuclear Energy Worker (NEW) contractors); Corporate Technical Services; and Administration.

**Table 1**

Fourth Quarter 2023 Whole Body Dose Results				
Work Group	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
UF <sub>6</sub> Plant	100	0.46	0.00	2.38
UO <sub>2</sub> Plant	23	0.12	0.00	0.32
Maintenance	82	0.23	0.00	1.89
Technical Support <sup>1</sup>	481	0.03	0.00	0.88
Corporate Technical Services	36	0.01	0.00	0.09
Administration	83	0.00	0.00	0.01
<b>Total (Max)</b>	<b>770</b>	<b>0.11</b>	<b>0.00</b>	<b>2.38</b>
<sup>1</sup> Includes contractors (NEWs)				

Table 2 shows the average, minimum and maximum quarterly individual external whole-body exposures from Q4 2022 through Q4 2023. The average whole-body dose is slightly higher to previous quarters. The maximum whole-body dose received by UF<sub>6</sub> personnel was related to work in the flame reactor area.

**Table 2**

<b>Whole Body Dose Results by Quarter</b>				
<b>Monitoring Period</b>	<b>Number of Individuals</b>	<b>Average Dose (mSv)</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>
Q4 2022	736	0.07	0.00	1.97
Q1 2023	684	0.10	0.00	2.08
Q2 2023	816	0.07	0.00	1.73
Q3 2023	855	0.05	0.00	1.30
Q4 2023	770	0.11	0.00	2.38

Skin Dose

Table 3 shows the quarterly skin dose summary results for six work groups: UF<sub>6</sub> Plant; UO<sub>2</sub> Plant; Maintenance; Technical Support (including NEW contractors); Corporate Technical Services; and Administration. The highest exposures are from the UF<sub>6</sub> work group related to work in the flame reactor area.

**Table 3**

<b>Fourth Quarter 2023 Skin Dose Results</b>				
<b>Work Group</b>	<b>Number of Individuals</b>	<b>Average Dose (mSv)</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>
UF <sub>6</sub> Plant	100	1.22	0.00	8.30
UO <sub>2</sub> Plant	23	0.37	0.00	1.08
Maintenance	82	0.79	0.00	5.02
Technical Support <sup>1</sup>	481	0.07	0.00	1.01
Corporate Technical Services	36	0.02	0.00	0.17
Administration	83	0.00	0.00	0.01
<b>Total (Max)</b>	<b>770</b>	<b>0.30</b>	<b>0.00</b>	<b>8.30</b>
<sup>1</sup> Includes contractors (NEWs)				

Table 4 shows the average and maximum quarterly individual skin exposure for Q4 2022 through Q4 2023. The average skin dose has slightly increased compared to previous quarters.



**Table 4**

<b>Skin Dose Results by Quarter</b>				
<b>Monitoring Period</b>	<b>Number of Individuals</b>	<b>Average Dose (mSv)</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>
Q4 2022	736	0.19	0.00	4.73
Q1 2023	684	0.33	0.00	7.82
Q2 2023	816	0.24	0.00	7.36
Q3 2023	855	0.16	0.00	4.94
Q4 2023	770	0.30	0.00	8.30

Eye Dose

Table 5 shows the quarterly eye dose summary results for six work groups: UF<sub>6</sub> Plant; UO<sub>2</sub> Plant; Maintenance; Technical Support (including NEW contractors), Corporate Technical Services; and Administration. The highest exposure is from the UF<sub>6</sub> work group related to time in the flame reactor areas of the UF<sub>6</sub> plant.

**Table 5**

<b>Fourth Quarter 2023 Eye Dose Results</b>				
<b>Work Group</b>	<b>Number of Individuals</b>	<b>Average Dose (mSv)</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>
UF <sub>6</sub> Plant	100	0.83	0.00	4.58
UO <sub>2</sub> Plant	23	0.26	0.00	0.69
Maintenance	82	0.51	0.00	3.20
Technical Support <sup>1</sup>	481	0.05	0.00	0.97
Corporate Technical	36	0.01	0.00	0.10
Administration	83	0.00	0.00	0.01
<b>Total (Max)</b>	<b>770</b>	<b>0.20</b>	<b>0.00</b>	<b>4.58</b>
<sup>1</sup> Includes contractors (NEWs)				

Table 6 shows the average and maximum quarterly individual external eye exposures for Q4 2022 through Q4 2023. The average eye dose is consistent compared to previous quarters.

**Table 6**

<b>Eye Dose Results by Quarter</b>				
<b>Monitoring Period</b>	<b>Number of Individuals</b>	<b>Average Dose (mSv)</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>
Q4 2022	736	0.13	0.00	2.42
Q1 2023	684	0.21	0.00	4.14
Q2 2023	816	0.15	0.00	4.08
Q3 2023	855	0.11	0.00	2.31
Q4 2023	770	0.20	0.00	4.58

Urine Analysis

The urine analysis action levels are presented in Table 7 below.

**Table 7**

<b>Urine Analysis Action Levels</b>		
	<b>Parameter</b>	<b>Action Level</b>
Urinalysis (NEW)	Weekly - UO <sub>2</sub> /UF <sub>6</sub> Operators, Maintenance, Technical Support	65 µg U/L
	Monthly - Administrative Support	25 µg U/L
	Long-term Contractors	65 µg U/L
	Short-term Contractors	80 µg U/L
	Chemical toxicity – post shift sample	500 µg U/L
	Fluoride toxicity – all samples	7 mg F/L
Urinalysis (Non-NEW)	Daily - Routine Sample	40 µg U/L
	Monthly - Routine Sample	25 µg U/L
	Chemical Toxicity - Post Shift Sample	500 µg U/L
	Fluoride Toxicity – All Samples	4 mg F/L

There were no fluoride in urine results above the action level of 7 mg F/L in Q4 2023.

Table 8 shows the distribution of urine results for Q4 2023. A total of 12,765 urine samples were collected and analyzed for uranium during Q4 2023. The majority of routine urine analysis results (99.2%) were less than 5 µg U/L in the quarter.

All results above 13 µg U/L were screened by radiation protection staff. There were no official investigations for uranium in urine during the Q3 2023.

**Table 8**

<b>Fourth Quarter 2023 Routine Urine Analysis Results</b>	
<b>Distribution of Results</b>	<b>Q4 2023</b>
Number of Samples < 5 µg U/L	12,765
Number of Samples > 5 to < 25 µg U/L	103
Number of Samples > 25 to < 50 µg U/L	5
Number of Samples > 50 µg U/L	0
Number of Samples Analyzed (Uranium)	12,873

Table 9 presents the internal urine analysis doses for the last five quarters. The average and maximum internal urine analysis doses in the quarter were 0.01 mSv and 0.19 mSv, respectively, which was consistent with previous quarters.

**Table 9**

<b>Internal Dose (Urine) by Quarter</b>				
<b>Quarter</b>	<b>Number of Individuals</b>	<b>Minimum Dose (mSv)</b>	<b>Maximum Dose (mSv)</b>	<b>Average Dose (mSv)</b>
Q4 2022	633	0.00	0.16	0.01
Q1 2023	586	0.00	0.21	0.01
Q2 2023	662	0.00	0.10	0.01
Q3 2023	735	0.00	0.23	0.01
Q4 2023	662	0.00	0.19	0.01

Fluoride in Urine

A total of 8,534 urine samples were analyzed for fluoride during Q4 with summary results provided in Table 10.

There were 14 routine and non-routine samples above the internal administrative investigation level of 4 mg F/L during Q4. The samples were investigated and entered into CIRS.

**Table 10**

<b>Fourth Quarter 2023 Fluoride in Urine Analysis Results</b>			
<b>Type of Fluoride Samples</b>	<b>Number of Samples</b>	<b>Minimum Concentration (mg F/L)</b>	<b>Maximum Concentration (mg F/L)</b>
All fluoride samples	8,534	0.0	6.4
Routine post-shift fluoride samples $\geq 7$ mg F/L	0	-	-
Routine post-shift fluoride samples $\geq 4$ mg F/L	1	-	-
Non-routine fluoride samples	293	0.1	3.5
Samples analyzed for U, insufficient volume (< 30mL) for F analysis	7	-	-

Lung Counting

The lung count trailer was at the Blind River Refinery for October and November Q4 2023. The Cameco Fuel Manufacturing was lung counted during the month of December 2023.

Contamination Control

The PHCF is divided into three zones for contamination control purposes. Zone 1 areas (clean areas - no radioactive sources other than monitoring equipment) are clearly delineated. Whole body monitors are located at the Zone 1 boundary in the main lobby, men's, and women's change rooms. There is also a monitor located at the gate 12 vehicle port. In Zone 2 areas and the yard Zone 3 areas (transition areas – may contain limited amounts of uranium compounds), no visible contamination should exist and, when detected, loose contamination is promptly isolated, monitored, cleaned, and monitored again to ensure the contamination has been removed. Zone 3 production areas are production areas where uranium compounds are expected. Incidents of zone contamination are presented in Table 11.

**Table 11**

<b>Q4 2023 Alpha Contamination Monitoring Results</b>			
<b>Area</b>	<b>Number of Samples Taken</b>	<b>Zone Contamination Criteria (Bq/cm<sup>2</sup>)</b>	<b>Number of Samples Above Criteria</b>
Zone 1	1,104	0.4	0
Zone 2	14,316	0.4	52
Zone 3 (Yard)*	1	0.4	1

\*Note – Samples are not routinely required in the yard area. Samples are taken as required if contamination is suspected.

The contamination in Zone 2 areas was primarily detected in the office areas and lunchrooms of production buildings. Contamination measurements are taken upon request in Zone 3 areas when contamination is suspected and only documented when above the applicable levels.

**In-Plant Air**

Routine air sampling is performed by collecting airborne particulate on air sampling filters and quantifying the airborne concentration of uranium. The Q4 results are presented in Table 12.

The site administrative level and derived air concentration (DAC), based on slow moving (low solubility) material, is 100 µg U/m<sup>3</sup> but protective measures, such as investigation and respiratory protection, are normally required as a precaution at lower DAC levels. Continuous air monitoring equipment (iCAMs) in the UF<sub>6</sub> and UO<sub>2</sub> plants are also used to provide early warning and to prompt response to elevated airborne uranium concentrations. Local alarms and direct communication with the control rooms provide early warning to plant personnel.

**Table 12**

<b>Fourth Quarter 2023 In-Plant Air Uranium Concentration by Operations Group</b>				
<b>Operations Group</b>	<b>Number of Samples Taken</b>	<b>Average (µg U/m<sup>3</sup>)</b>	<b>Maximum (µg U/m<sup>3</sup>)</b>	<b>Number of Samples Taken Above Administrative Level</b>
UF <sub>6</sub> Plant	5,149	16	717	153
UO <sub>2</sub> Plant	1,475	3	38	0
Waste Recovery	791	1	22	0
CUP	376	1	41	0

The maximum in-plant air sample of 717  $\mu\text{g U}/\text{m}^3$  was recorded on November 4, 2023, in the  $\text{UF}_6$  plant. This result was due to work in the flame reactor and ashcan area.

The average in-plant air concentrations are consistent with previous quarters.

### 3.0 Conventional Health and Safety

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

Conventional safety statistics are presented in Table 13.

**Table 13**

2023 Safety Statistics					
Quarter / Parameter	Q1 2023	Q2 2023	Q3 2023	Q4 2023	YTD
First Aid Injuries	12	15	12	10	49
Medical Diagnostic Procedures	1	8	5	4	18
Medical Treatment Injuries	5	3*	3	2	13
Other Recordable Injuries	1	0	0	0	1
Lost Time Injuries	0	0	0	0	0
Lost Time Injury Frequency	0	0	0	0	0
Lost Time Injury Severity	0	0	0	0	0

\*Medical treatment updated – Claim previously denied by WSIB has now been accepted.

There were no lost time incidents that occurred in Q4.

#### Health and Safety Activities

- **Communications:** OHS and CSSC continued to issue safety bulletins to promote a focus on continuing safety awareness. Safety meeting presentations were also used to communicate the status of yearly safety targets.
- **Education and Training:** Training continued routinely using both in person methods and computer-based learning.
- **Safety Awareness Activities:** The site reached 5 years without a lost time injury on September 8. Celebration BBQs were held the week of October 10, and a choice of recognition gift was provided to employees. A vendor show was held November 14 and 15 providing employees and contractors the opportunity to interact with a variety of health and safety vendors and their products.
- **CSSC:** The CSSC committee continues to meet for regulatory meetings.

- **Safety & Industrial Hygiene:** The safety group focused on completing HIRAC assessments and ergonomic assessments in 2023. These assessments were continued in the fourth quarter. 24 ergonomic assessments and 13 HIRAC assessments were completed in 2023.
- **Total Recordable Injury Rate (TRIR) – Q4 Ending = 3.31** (10 First Aids, 4 Medical Diagnostics, 2 Medical Treatments). Site has more than 4.6 million hours without a Lost Time Injury. Contractor TRIR YTD is 4.12.



#### 4.0 Environmental Protection

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

##### Public Dose

ORL equations for Site 1 and Site 2 have been derived and are expressed in the form shown below.

$$\text{Public Dose} = \text{Dose}_{\text{Air}} + \text{Dose}_{\text{Water}} + \text{Dose}_{\text{Gamma}} < 0.3 \text{ mSv/y}$$

The monthly dose from Site 1 and Site 2 are based on monitoring results for each dose component as shown in Table 14.

**Table 14**

<b>Quarterly Dose (mSv/quarter)</b>					
<b>ORL Component</b>	<b>Q1 2023</b>	<b>Q2 2023</b>	<b>Q3 2023</b>	<b>Q4 2023</b>	<b>2023 Total</b>
Air	<0.001	<0.001	<0.001	<0.001	0.001
Water	<0.001	<0.001	<0.001	<0.001	0.001
Gamma – Site 1	0.026	0.031	0.019	0.019	0.095
Gamma – Site 2	0.036	0.039	0.033	0.019	0.126
Quarterly Dose – Site 1	0.027	0.031	0.020	0.019	0.097
Quarterly Dose – Site 2	0.037	0.039	0.034	0.019	0.128

##### Gamma Monitoring

Dose to the public is calculated for both site 1 and 2 using specific gamma fenceline monitoring locations. The results at station 2 are used for site 1 public dose calculations and the results at station 21 are used for site 2 public dose calculations. The results at these locations for this quarter are summarized and compared with regulatory action levels in Table 15.

There were no monthly gamma radiation action levels exceeded during Q4.

**Table 15**

<b>Fourth Quarter 2023 Public Dose Gamma Monitoring Results</b>					
<b>Station Number</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>Action Level (µSv/h)</b>	<b>Licence Limit (µSv/h)</b>
2	0.150	0.170	0.090	0.400	0.570
10	0.000	0.020	0.020	0.400	0.610
21	0.000	0.020	0.000	0.250	0.260

**Air Emissions**

The quarterly average and maximum stack emissions from the UF<sub>6</sub> plant main stack and the UO<sub>2</sub> plant main stack are presented in Table 16.

A stack monitoring program is used to determine the airborne uranium emission rates on a daily basis from the main stacks of the UF<sub>6</sub> and UO<sub>2</sub> plants.

No licensed action levels were exceeded for uranium emissions from the UF<sub>6</sub> plant main stack in the quarter. The UF<sub>6</sub> main stack average uranium emission rate was consistent with previous quarters during which production was operational.

No licensed action levels were exceeded for uranium emissions from the UO<sub>2</sub> plant main stack in the quarter. The UO<sub>2</sub> main stack average uranium emission rate was consistent with previous quarters during which production was operational.

Fluoride emissions from the UF<sub>6</sub> main stack are sampled and analyzed on a continuous basis using an on-line analyzer and the data is collected on the plant computer system. No licensed action levels were exceeded for fluorides in the quarter. The UF<sub>6</sub> main stack average fluoride emission rate was consistent with previous quarters during which production was operational.

The UO<sub>2</sub> main stack is also continuously sampled for ammonia. No licensed action levels were exceeded for ammonia emissions from the UO<sub>2</sub> plant main stack in the quarter. The UO<sub>2</sub> main stack average ammonia emission rate was consistent with previous quarters.

**Table 16**

Daily Main Stack Emissions by Quarter									
Plant	Parameter	Licence Limit	Action Level	Value	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023
UF <sub>6</sub>	Uranium g U/h	280	40	Quarterly Daily Average	1.9	2.5	2.1	2.1	2.7
				Quarterly Daily Maximum	3.7	5.0	4.3	10.7	6.3
	Hydrogen Fluoride g HF/h	650	230	Quarterly Daily Average	12	9	16	15	10
				Quarterly Daily Maximum	201	60	197	107	75
UO <sub>2</sub>	Uranium g U/h	240	10	Quarterly Daily Average	0.5	0.8	1.1	0.6	0.7
				Quarterly Daily Maximum	1.4	1.7	2.9	1.8	1.4
	Ammonia kg NH <sub>3</sub> /h	58	10	Quarterly Daily Average	2.0	2.3	1.7	1.6	2.0
				Quarterly Daily Maximum	4.3	4.6	2.8	4.6	3.0

Liquid Discharges

The PHCF ceased operating a once-through non-contact cooling water system in support of UF<sub>6</sub> plant operations in mid-July 2023 in association with a transition to a closed loop cooling system. The UO<sub>2</sub> plant had previously ceased discharging once-through cooling water to the harbour in late-July 2022 in association with a transition to a separate closed loop cooling system.

A daily sanitary sewer discharge uranium action level of 100 µg U/L (0.10 mg U/L) and a monthly mean release limit of 275 µg U/L (0.275 mg U/L) are currently in place. Tables 17 and 18 summarize uranium concentrations and pH values recorded for the fourth quarter of 2023. Facility discharge quality remained well below the monthly average limit during the quarter.

In early January, sanitary sewer trending increased corresponding to a period of unreasonably warm and rainy weather. The magnitude and frequency of precipitation

events has been seen to influence sanitary sewer quality as a function of an increase in groundwater infiltration potential. The mid-January action level excursion groupings were partially influenced by Powerhouse effluent discharges. Harbour water was entering the sanitary sewer system at the Powerhouse, and harbour water trending was elevated during the period in question. The harbour water supply to the Powerhouse was ultimately isolated by January 20 and a municipal water supply displaced former harbour water uses. Uranium trending decreased following the Powerhouse remedial actions, but trending increases were subsequently observed starting in mid-March in association with warmer ambient conditions and precipitation events that exacerbated baseline groundwater infiltration conditions.

The March and April 2023 sanitary sewage uranium excursions are interpreted to have resulted from groundwater infiltration, exacerbated by precipitation events and spring thaw conditions. Uranium trending has generally decreased since April, and no uranium excursions were recorded for the third quarter.

Cameco has evaluated targeted sanitary sewer infrastructure rehabilitation, replacement and/or abandonment tasks, taking into consideration work completed to date and planned site and VIM project sanitary sewer system improvements. Near term focus items include the replacement and realignment of sewer infrastructure servicing existing facility lift stations and portions of Building 20, and the abandonment of associated inactive utilities. Rehabilitation work had also been planned for the Building 13 lateral service. Sewer contractor work had been initiated in preparation for a planned service reline, however, it's been determined the work scope needs to be expanded to include the replacement of at least a portion of the service. At present, it's anticipated the Building 13 sanitary sewer infrastructure work will likely be initiated in spring 2024.

**Table 17**

<b>Sanitary Sewer Discharge Data by Quarter</b>							
<b>Parameter</b>	<b>Units of Measure</b>	<b>Value</b>	<b>Q4 2022</b>	<b>Q1 2023</b>	<b>Q2 2023</b>	<b>Q3 2023</b>	<b>Q4 2023</b>
Uranium	mg U/L	Average	0.040	0.039	0.038	0.0054	0.0039
		Maximum	0.094	0.22	0.10	0.020	0.021
pH	-	Minimum	7.56	7.39	7.44	7.26	7.59
		Maximum	8.22	8.84	8.28	8.29	8.96

**Table 18**

<b>Q4 2023 Monthly Sanitary Sewer Discharges</b>			
<b>Period</b>	<b>Sanitary Sewer Action Level/Release Limit</b>	<b>Monthly Average Uranium Concentration (µg U/L)</b>	<b>Daily Maximum Uranium Concentration (µg U/L)</b>
October	Action Level of 100 µg U/L – daily composite samples	3.0	17
November	Release Limit of 275 µg U/L – monthly average of daily composite samples	4.7	21
December		4.0	10

Ambient Air Monitoring

Table 19 shows the quarterly all-station average and maximum uranium dustfall results from Q4 2022 through to Q4 2023.

No uranium dustfall results exceeded the internal administrative screening level in the fourth quarter. The average uranium in dustfall results in the fourth quarter of 2023 were consistent with the uranium in dustfall averages during the previous quarters.

**Table 19**

<b>Uranium in Dustfall Results by Quarter</b> (mg U/m <sup>2</sup> /30 days)					
<b>Value</b>	<b>Q4 2022</b>	<b>Q1 2023</b>	<b>Q2 2023</b>	<b>Q3 2023</b>	<b>Q4 2023</b>
Average	0.2	<0.1	0.1	0.3	0.3
Maximum	1.3	0.1	0.2	0.9	1.8
Internal Administrative Screening Level = 10 mg U/m <sup>2</sup> /30 days					

Table 20 summarizes the average and maximum uranium hi-vol results from Q4 2022 through to Q4 2023.

On October 6, 2023, Cameco reported to the Ontario Ministry of Environment, Conservation and Parks (MECP) an ambient station high volume air sampler (hi-vol) exceedance of 179 µg TSP/m<sup>3</sup> total suspended particulate (TSP) for the period of October

4-5, 2023, at the Marsh Street Hi-Vol station. The measurement was above the ECCC and MECP  $120 \mu\text{g}/\text{m}^3$  TSP dust criteria for visibility and was attributed to construction work immediately adjacent to the hi-vol station.

CIRS # PHCF-2023-001559 was entered for an elevated U results at Shuter Street high volume air sampling (hi-vol) station on November 29, 2023. The hi-vol result was  $0.409 \mu\text{g U}/\text{m}^3$  in TSP which is above the AAQC for 24 hr U in TSP but below the MECP DAV/URT (Daily Assessment Value/Upper Risk Threshold) reportable level of  $1.5 \mu\text{g U}/\text{m}^3$  for 24 hr.

**Table 20**

<b>Uranium-in-Air Concentration at Hi-Vol Stations by Quarter (<math>\mu\text{g U}</math> in <math>\text{TSP}/\text{m}^3</math>)</b>					
<b>Quarter</b>	<b>Result</b>	<b>Waterworks</b>	<b>Shuter Substation</b>	<b>Marsh Street</b>	<b>Hayward Street</b>
Q4 2022	Average	0.001	0.001	0.003	0.002
	Maximum	0.006	0.004	0.010	0.015
Q1 2023	Average	0.008	0.001	0.006	0.002
	Maximum	0.381	0.003	0.132	0.047
Q2 2023	Average	0.002	0.001	0.005	0.002
	Maximum	0.007	0.005	0.022	0.010
Q3 2023	Average	0.002	0.002	0.009	0.004
	Maximum	0.009	0.021	0.099	0.027
Q4 2023	Average	0.002	0.008	0.006	0.003
	Maximum	0.012	0.409	0.104	0.066
Average $<0.06 \mu\text{g U}$ in $\text{TSP}/\text{m}^3$ (annual) AAQC					
Maximum $<0.3 \mu\text{g U}$ in $\text{TSP}/\text{m}^3$ (24 hr) AAQC					

Table 21 shows the quarterly all-station average and maximum fluoride dustfall results from Q4 2022 through to Q4 2023.

The average fluoride in dustfall results in the fourth quarter of 2023 were consistent with previous quarters.

**Table 21**

<b>Fluoride in Dustfall Results by Quarter</b> ( $\text{mg F}/\text{m}^2/30$ days)					
<b>Value</b>	<b>Q4 2022</b>	<b>Q1 2023</b>	<b>Q2 2023</b>	<b>Q3 2023</b>	<b>Q4 2023</b>
Average	0.8	0.6	1.1	0.8	1.0
Maximum	4.2	5.3	5.5	6.8	7.0
Internal Administrative Screening Level = $20 \text{ mg F}/\text{m}^2/30$ days					

Table 22 shows the average and maximum lime candle results from the fourth quarter of 2022 through to the fourth quarter of 2023. The average results are comparable to levels observed in the previous quarters.

**Table 22**

<b>Monthly Lime Candle Results by Quarter</b> ( $\mu\text{g F}/100 \text{ cm}^2/30 \text{ days}$ )					
<b>Value</b>	<b>Q4 2022</b>	<b>Q1 2023</b>	<b>Q2 2023</b>	<b>Q3 2023</b>	<b>Q4 2023</b>
Average	2	3	3	3	4
Maximum	4	4	7	10	9
The desirable ambient air quality criteria for lime candles are to protect forage crops consumed by livestock. During the summer growing season (April 1 – October 31), the criteria is $40\mu\text{g F}/100\text{cm}^2/30 \text{ days}$ , changing to $80\mu\text{g F}/100\text{cm}^2/30 \text{ days}$ in winter (November 1 – March 31).					

## 5.0 Public Information Program

During the fourth quarter of 2023, PHCF continued to meet the requirements of CNSC RD/GD 3.2.1, Public Information and Disclosure programs.

### Public Engagement

On October 5, 2023, Cameco announced the opening of the application process for the Cameco Fund for Mental Health. A news release was issued to local media, posted on the website and promoted on social media. Recipients of the Cameco Fund for Mental Health were announced on December 12, 2023. A total of 11 organizations in the Northumberland County area received grants. A news release was issued to local media, posted on the website and promoted on social media.

Cameco representatives attended the Queen's University Career Fair on October 3 and 4 to talk to students about the work Cameco does and the types of careers offered.

Cameco was a sponsor of the NAYGN Canadian Regional Conference on October 11, 2023. A Cameco subject matter expert presented at the conference and Cameco hosted an information booth about its operations.

Cameco sponsored and attended the Port Hope & District Business Chamber Awards on October 20, 2023. Cameco was the winner of the Healthy Workplace award which recognizes a business that demonstrates a commitment to supporting the health, safety, and well-being of employees, clients, customers, and the broader community.

Cameco participated in Loyalist College's Industry Day on October 21, 2023. Cameco's booth provided information about Cameco's local operations and the opportunity for visitors to engage with a Cameco subject matter expert.

On November 4, 2023 Cameco representatives attended the Northumberland Hills Hospital annual gala. Cameco was a sponsor of the gala which raises funds for the hospital.

The fall issue of Energize was mailed out to residents of Port Hope in November. A digital version was also posted on the Cameco website on November 9. Stories in this issue included Cameco's 35<sup>th</sup> anniversary, Vision in Motion update, closed loop cooling system at PHCF and the Cameco Fund for Mental Health.

Cameco entered a float in the Port Hope and Cobourg Santa Claus Parades and sponsored a tree for the Capitol Theatre Festival of Lights and Trees.



On December 13, the PHCF’s general manager made a \$24,000 donation to the Northumberland Fare Share Food Bank on behalf of Cameco employees.

Cameco provided free advertising to local charitable organizations with its sponsorship of MyFM’s Community Partner Program. Through the quarter, Northumberland United Way, Community Care Northumberland and Northumberland Hills Hospital Foundation benefitted from this sponsorship by receiving advertising.

Public Disclosure

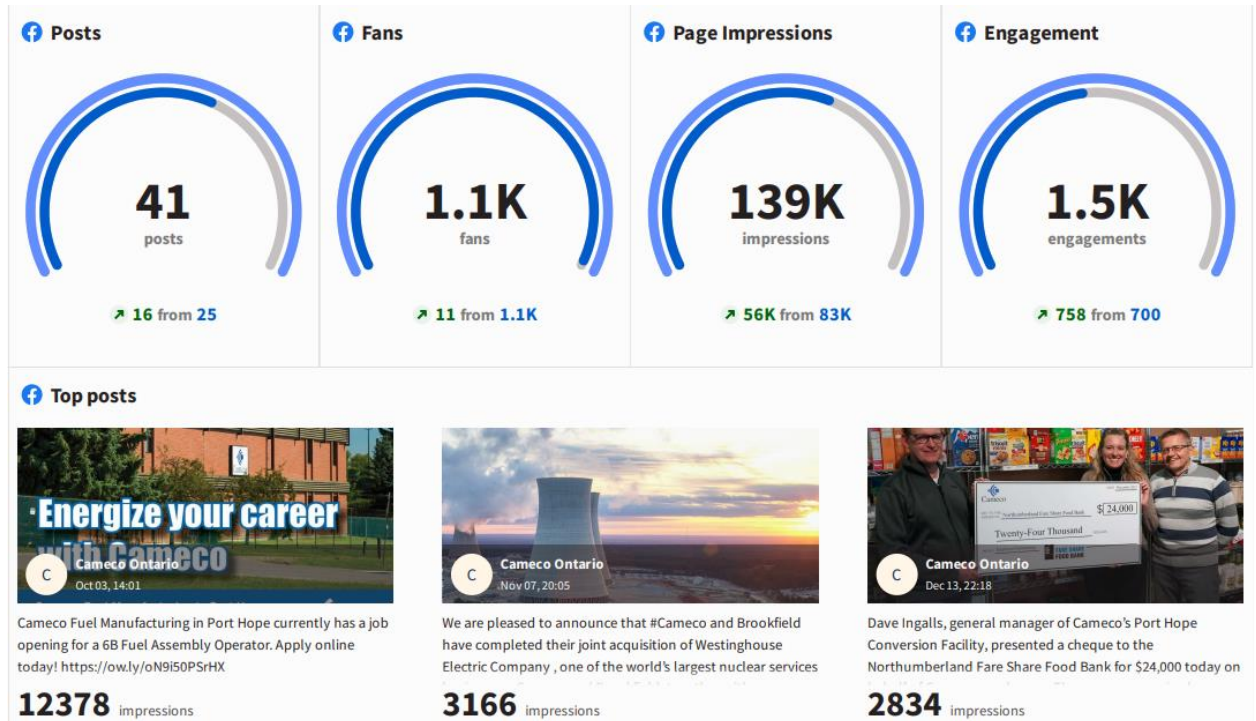
PHCF made three public disclosures during the fourth quarter: [Environment & Safety - Conversion: Port Hope - Fuel Services - Businesses - Cameco](#)

Posting Date	October 10, 2023
Incident Date	October 4 - 5, 2023
Incident	Environmental Limit Exceedance
Details	<p>The Marsh Street high volume air sampler recorded a result of 179 µg TSP/m<sup>3</sup> total suspended particulate (TSP) for the period of October 4-5, 2023. This result is above the regulatory dust criteria of 120 µg/m<sup>3</sup> set by Environment and Climate Change Canada and the Ministry of Environment, Conservation and Parks.</p> <p>There was no health or safety risk posed to the public, workers, or the environment.</p>
Corrective Action	<p>Watermain construction work is occurring on Marsh Street and on-site which is believed to be contributing to the elevated localized dust loading measured by the Marsh Street Hi-Vol.</p> <p>The Canadian Nuclear Safety Commission and the Ministry of Environment, Conservation and Parks have been notified.</p>
Cameco Environmental Effect Rating	1

Posting Date	October 17, 2023
Incident Date	October 17, 2023
Incident	Non-Occupational Emergency Transport
Details	<p>An ambulance was dispatched to the Port Hope Conversion Facility on October 17, 2023, for a non-occupational medical emergency.</p> <p>There was no health or safety risk posed to the public, workers, or the environment.</p>
Corrective Action	The worker was transported to the hospital.
Cameco Environmental Effect Rating	1
Posting Date	December 13, 2023
Incident Date	December 4, 2023
Incident	Transportation Incident
Details	<p>Port Hope Conversion Facility (PHCF) was transferring waste to the Long-Term Waste Management Facility (LTWMF) on December 4, 2023, when it was discovered that the lid of the roll-off bin was slightly contaminated.</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	The roll-off bin has since been decontaminated and returned to PHCF where it was cleaned and repainted as well. Cameco has modified its process to scan the top of the lid for contamination. Cameco reported the event to the Canadian Nuclear Safety Commission's transport section.
Cameco Environmental Effect Rating	1

## Social Media

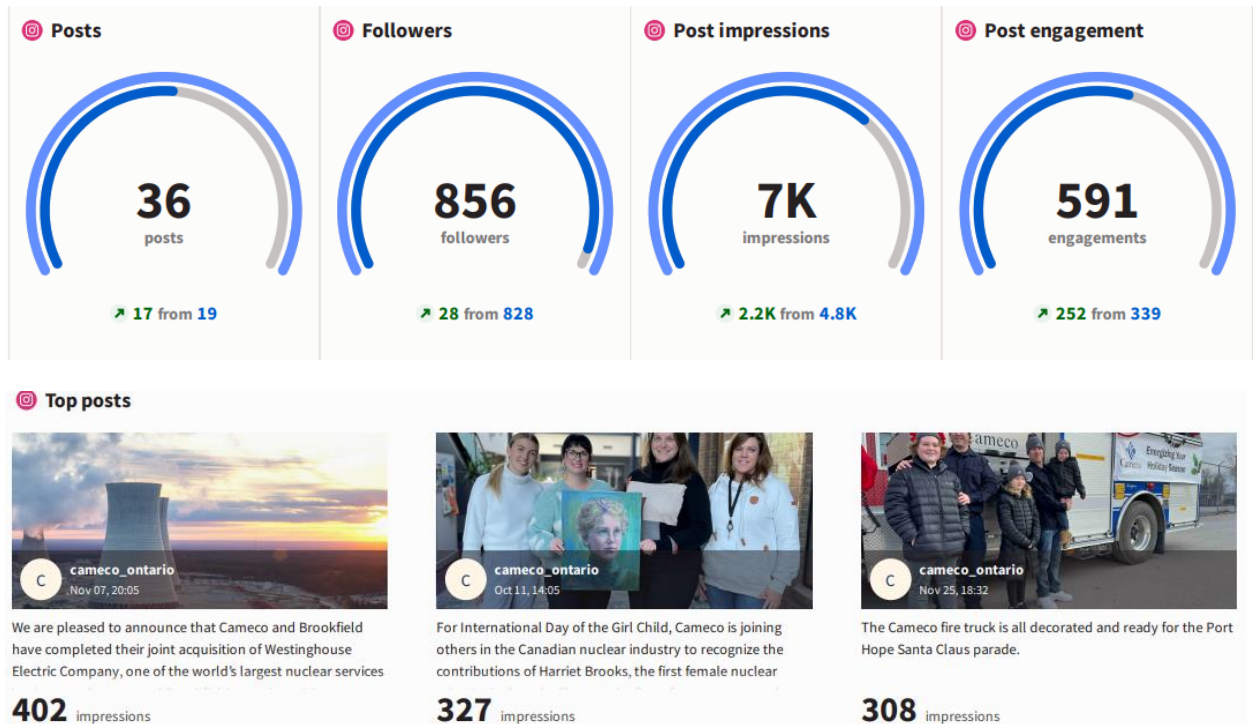
### Facebook – October 1, 2023 to December 31, 2022



Cameco Ontario's 41 posts covered information such as:

- Cameco's participation at Loyalist College Industry Day and the NAYGN conference
- Recognition of the International Day of the Girl Child
- Cameco Fund for Mental Health application process and grants announcement
- A message from Cameco's president and CEO
- Celebrating Cameco's 35<sup>th</sup> Anniversary
- Career openings
- PHCF's employee donation to Northumberland Fare Share Food Bank
- A message from Cameco's chief operating officer
- Cameco's participation at COP28
- Cameco's sponsorship of Net Zero Nuclear
- Cameco's participation in the Cobourg and Port Hope Santa Claus Parades
- The fall issue of Energize
- PHCF's planned emergency training exercises

### Instagram – October 1, 2023 to December 31, 2023



Photos and information featured on Instagram were similar to the Cameco Facebook page.

#### Website

News release announcing the opening of the application process for the Cameco Fund for mental health:

- [Cameco’s Fund for Mental Health Opens 2023 Application Process - News Archive - Media - Cameco Fuel Services](#)

News release announcing the Cameco Fund for Mental Health 2023 grant recipients:

- [Cameco Fund for Mental Health 2023 Awards Grants to 11 Northumberland County Organizations - News Archive - Media - Cameco Fuel Services](#)

The fall issue of Energize:

- [Energize - Fall 2023 - Making a Difference - Community - Cameco Fuel Services](#)

The Q3 Compliance Report was posted to the website:

- [Media Library - Media - Cameco Fuel Services](#)

The updated Port Hope Conversion Facility – Public Summary – Preliminary Decommissioning Plan was posted to the website:

- [Media Library - Media - Cameco Fuel Services](#)

Three public disclosures were posted to the website:

- [Environment & Safety - Conversion: Port Hope - Fuel Services - Businesses - Cameco](#)

### Media Analysis

Cameco received media coverage about the Cameco Fund for Mental Health

- **Cameco Fund for Mental Health 2023 Awards Grants to 11 Northumberland County Organizations** – December 13, 2023 – Today’s Northumberland
  - [Cameco Fund for Mental Health 2023 Awards Grants to 11 Northumberland County Organizations - Today's Northumberland - Your Source For What's Happening Locally and Beyond \(todaysnorthumberland.ca\)](#)

Cameco received media coverage about its planned emergency training exercise

- **Cameco Holds Mock Emergency at the Port Hope Facility** – October 29, 2023 – Today’s Northumberland
  - [Cameco Holds Mock Emergency at the Port Hope Facility - Today's Northumberland - Your Source For What's Happening Locally and Beyond \(todaysnorthumberland.ca\)](#)

### Communication Products

The Fall 2023 edition of Energize was mailed to all addresses in Port Hope and posted online and social media.

- [Energize - Fall 2023 - Making a Difference - Community - Cameco Fuel Services](#)

News releases regarding the Cameco Fund for Mental Health were posted on the website and issued to local media.

- [Cameco’s Fund for Mental Health Opens 2023 Application Process - News Archive - Media - Cameco Fuel Services](#)
- [Cameco Fund for Mental Health 2023 Awards Grants to 11 Northumberland County Organizations - News Archive - Media - Cameco Fuel Services](#)

## 6.0 Indigenous Engagement

On November 1, 2023, the leaders and select employees from Fuel Services Division attended Trent University’s First People’s House of Learning for an interactive training session, ‘Just Get Over it’.

Cameco and Curve Lake First Nation’s Oversight Committee met in-person on November 2, 2023. The Oversight Committee members discussed Cameco’s operations with a focus on Fuel Services Division. A roadmap was determined for the next six months, confirming meeting dates and making preliminary plans for site visits in 2024. On December 13, 2023, Cameco and Curve Lake First Nation’s Environmental Working Group met in-person. The Environmental Working Group members discussed deliverables for the year ahead, roles and responsibilities and set future meeting dates. The Oversight Committee and Environmental Working Group are made up of designated members of both Cameco and Curve Lake First Nation.

The Cameco Fund for Mental Health news release with information on how to apply was sent via email to Hiawatha, Alderville, Curve Lake, Mississaugas of Scugog Island and Mississauga First Nation on October 5, 2023. A second email was sent on October 17, 2023, as a follow-up reminder that the Fund was open for applications. Alderville First Nation’s Mino-Bemaadiziwin (A Good Life) Dinner Series was a Cameco Fund for Mental Health recipient. This project will bring together mainstream health professionals and Indigenous Elders and Knowledge Keepers.

Cameco provided funding to Curve Lake’s Recreation Committee to build and expand parks on the reservation.

Public disclosures are emailed to Curve Lake and Scugog Island First Nations as they occur, and they are then discussed at the next scheduled meeting. Disclosures were emailed on October 11, 2023, October 19<sup>th</sup>, 2023 and December 14, 2023.

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## **7.0 Other Matters of Regulatory Interest**

### **7.1 Vision in Motion**

VIM engineering and procurement activities continued for Building 72 (new warehouse); the large excavation to be completed west of the turning basin, including planning for an on-site trial of the execution methodology to be conducted in 2024. Engineering for the warehouse demolition (Buildings 6, 7, 12, 12A) was completed. A contract for the removal of equipment in building 2 was awarded.

Coordination with CNL continued. CNL provided feedback to Cameco on a draft legal agreement that will support remediation activities with shared responsibilities at the Centre Pier and near the Cameco fence line along the harbour. CNL continued with soil removal at the centre pier on Cameco's behalf according to the protocol established earlier in the year.

Building 27 structure removal work was completed. Equipment removal continued in Building 5B, Building 14, and Building 15. Mobilization preparations began for equipment removal in Building 2.

Waste shipments to the LTWMF continued, including packaged wastes, bulk wastes (dump trucks and roll-off bins) and vac trucks.

The Supplementary Environmental Monitoring Plan for Vision in Motion and Other Clean-Up Program Projects is in place to monitor environmental impacts for the VIM activities, primarily during demolition/excavation.

There were no environmental monitoring exceedances that occurred in the fourth quarter related to VIM activities; however, an elevated hi-vol air sampler total suspended particulates (TSP) was recorded November 20, 2023, as a result of CNL remediation activities at Center Pier.

## **8.0 Concluding Remarks**

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

In the fourth quarter of 2023, PHCF did not exceed any CNSC regulatory limits. As a result of the effective programs, plans and procedures in place, the PHCF was able to maintain individual radiation exposures well below all regulatory dose limits. In addition, environmental emissions continued to be controlled to levels that are a fraction of the CNSC regulatory limits, and public radiation exposures are also well below the regulatory limits.

PHCF's ALARA program continued to be effective in the fourth quarter of 2023.

Cameco's relationship with local residents remains strong and Cameco is committed to maintaining the strong support and trust developed over the past several years.