



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

Reporting Period January 1 – March 31, 2023

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

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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, PHCF's operations have 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 First 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 first quarter.

For the January 4, 5, 13 - 15, 17, 18 and March 25, 26 monitoring periods, the daily sanitary sewer discharge composite sample uranium value was reported at or above the daily action level. Facility discharge quality remained well below the monthly average limit during the quarter.

On January 6, 2023, a UF₆ cylinder on a flat rack was being loaded onto a truck using a large fork truck. The load tipped too soon causing the flat rack/cylinder to fall to the ground. There were no injuries or impact to the environment as a result of this event.

On January 12, 2023, a transport truck leaked a small amount of transmission fluid to the ground. Due to weather conditions, the fluid was able to discharge to a nearby catch basin.

Both the UF₆ plant and the UO₂ plant operated without interruption in the first quarter.

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.

A project to replace the current cooling water systems for both the UF₆ and UO₂ plants with closed loop cooling water systems began in 2022. The UO₂ plant ceased discharging once-through cooling water to the harbour in late-July 2022. Commissioning for the UO₂ plant closed loop cooling system was completed in Q4 2022. Commissioning for the UF₆ plant is scheduled for 2023. The Safety Analysis Report was updated to reflect these changes and has been approved by CNSC staff.

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 the radiation protection program using ALARA principles in order to ensure doses are maintained well below regulatory limits.

There were no radiation dose action level exceedances in the first quarter of 2023.

Whole Body Dose

Table 1 shows the whole-body dose summary results from the first quarter of 2023 for six work groups: UF₆ Plant; UO₂ Plant, Maintenance; Technical Support (including Nuclear Energy Worker (NEW) contractors), Corporate Technical Services (formerly named Major Projects); and Administration.

Table 1

First Quarter 2023 Whole Body Dose Results				
Work Group	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
UF ₆ Plant	96	0.42	0.00	2.08
UO ₂ Plant	24	0.14	0.00	0.36
Maintenance	64	0.16	0.00	1.60
Technical Support ¹	424	0.03	0.00	1.10
Corporate Technical Services	37	0.01	0.00	0.10
Administration	76	0.01	0.00	0.05
Total (Max)	684	0.10	0.00	2.08
¹ Includes contractors (NEWs)				

Table 2 shows the average, minimum and maximum quarterly individual external whole-body exposures for the first quarter of 2022 through to the first quarter of 2023. The average whole-body dose is slightly elevated compared to the previous quarters when production was operational. The maximum whole-body dose received by a UF₆ employee was related to work in the flame reactor and effluent areas.

Table 2

Whole Body Dose Results by Quarter				
Monitoring Period	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
Q1 2022	615	0.06	0.00	1.68
Q2 2022	700	0.03	0.00	1.10
Q3 2022	825	0.05	0.00	1.40
Q4 2022	736	0.07	0.00	1.97
Q1 2023	684	0.10	0.00	2.08

Skin Dose

Table 3 shows the quarterly skin dose summary results for six work groups: UF₆ Plant; UO₂ Plant; Maintenance; Technical Support (including NEW contractors), Corporate Technical Services (formerly named Major Projects); and Administration. The highest exposures are from the UF₆ work group related to work in the ashcan and effluent areas.

Table 3

First Quarter 2023 Skin Dose Results				
Work Group	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
UF ₆ Plant	96	1.36	0.00	7.82
UO ₂ Plant	24	0.50	0.00	1.47
Maintenance	64	0.79	0.00	5.25
Technical Support ¹	424	0.08	0.00	1.57
Corporate Technical Services	37	0.14	0.00	0.81
Administration	76	0.01	0.00	0.16
Total (Max)	684	0.33	0.00	7.82
¹ Includes contractors (NEWs)				

Table 4 shows the average and maximum quarterly individual skin exposure for the first quarter of 2022 through to the first quarter of 2023. The average skin dose has increased compared to previous quarters when production was operational due to operator time in the flame reactor and effluent areas.

Table 4

Skin Dose Results by Quarter				
Monitoring Period	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
Q1 2022	615	0.25	0.00	5.88
Q2 2022	700	0.15	0.00	5.89
Q3 2022	825	0.18	0.00	4.85
Q4 2022	736	0.19	0.00	4.73
Q1 2023	684	0.33	0.00	7.82

Eye Dose

Table 5 shows the quarterly eye dose summary results for six work groups: UF₆ Plant; UO₂ Plant; Maintenance; Technical Support (including NEW contractors), Corporate Technical Services (formerly named Major Projects); and Administration. The highest exposure is from the UF₆ group related to time in the flame reactor and effluent areas.

Table 5

First Quarter 2023 Eye Dose Results				
Work Group	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
UF ₆ Plant	96	0.87	0.00	4.14
UO ₂ Plant	24	0.34	0.00	0.92
Maintenance	64	0.46	0.00	2.55
Technical Support ¹	424	0.06	0.00	1.37
Corporate Technical Services	37	0.02	0.00	0.30
Administration	76	0.01	0.00	0.12
Total (Max)	684	0.21	0.00	4.14
¹ Includes contractors (NEWs)				

Table 6 shows the average, minimum and maximum quarterly individual external eye exposures for the first quarter of 2023.

Table 6

Eye Dose Results by Quarter				
Monitoring Period	Number of Individuals	Average Dose (mSv)	Minimum Dose (mSv)	Maximum Dose (mSv)
Q1 2022	615	0.15	0.00	2.58
Q2 2022	700	0.09	0.00	3.16
Q3 2022	825	0.11	0.00	3.09
Q4 2022	736	0.13	0.00	2.42
Q1 2023	684	0.21	0.00	4.14

Urine Analysis

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

Table 7

Urine Analysis Action Levels		
Parameter		Action Level
Urinalysis (NEW)	Weekly - UO ₂ /UF ₆ 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 the first quarter of 2023.

Table 8 shows the distribution of urine results for the first quarter of 2023. A total of 12,102 urine samples were collected and analyzed for uranium during the first quarter of 2023. The majority of routine urine analysis results (98.7%) 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 first quarter of 2023.

Table 8

First Quarter 2023 Routine Urine Analysis Results	
Distribution of Results	Q1 2023
Number of Samples < 5 µg U/L	11,943
Number of Samples > 5 to < 25 µg U/L	145
Number of Samples > 25 to < 50 µg U/L	12
Number of Samples > 50 µg U/L	2
Number of Samples Analyzed (Uranium)	12,102

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 0.21 mSv, respectively, which was consistent with previous quarters.

Table 9

Internal Dose (Urine) by Quarter				
Quarter	Number of Individuals	Minimum Dose (mSv)	Maximum Dose (mSv)	Average Dose (mSv)
Q1 2022	493	0.00	0.26	0.01
Q2 2022	586	0.00	0.16	0.01
Q3 2022	676	0.00	0.20	0.01
Q4 2022	633	0.00	0.16	0.01
Q1 2023	586	0.00	0.21	0.01

Fluoride in Urine

A total of 7,869 urine samples were analyzed for fluoride during the first quarter with summary results provided in Table 10.

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

Table 10

First Quarter 2023 Fluoride in Urine Analysis Results			
Type of Fluoride Samples	Number of Samples	Minimum Concentration (mg F/L)	Maximum Concentration (mg F/L)
All fluoride samples	7,869	0.1	4.3
Routine post-shift fluoride samples ≥ 7 mg F/L	0	-	-
Routine post-shift fluoride samples ≥ 4 mg F/L	0	-	-
Non-routine fluoride samples	467	0.1	4.3
Samples analyzed for U, insufficient volume (< 30 mL) for F analysis	3	-	-

Lung Counting

The lung count trailer was at the PHCF site in the first quarter of 2023. The PHCF production and maintenance groups were lung counted.

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

First Quarter 2023 Alpha Contamination Monitoring Results			
Area	Number of Samples Taken	Zone Contamination Criteria (Bq/cm²)	Number of Samples Above Criteria
Zone 1	1,092	0.4	0
Zone 2	12,116	0.4	62**
Zone 3 (Yard)*	1	0.4	0

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

** Note – 25 tables and chairs were removed from site (from zone 2 areas) due to the manufactured material interfering with the monitoring equipment.

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 first quarter 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/m³ 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 UF₆ and UO₂ 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

First Quarter 2023 In-Plant Air Uranium Concentration by Operations Group				
Operations Group	Number of Samples Taken	Average (µg U/m³)	Maximum (µg U/m³)	Number of Samples Taken Above Administrative Level
UF ₆ Plant	3,237	9	477	31
UO ₂ Plant	1,525	2	60	0
Waste Recovery	740	1	8	0
CUP	440	2	16	0

The maximum in-plant air sample of 477 $\mu\text{g U}/\text{m}^3$ was recorded on January 3, 2023, in the UF_6 plant. This result was due to a pipe leak in the UF_6 plant.

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	-	-	-	12
Medical Diagnostic Procedures	0	-	-	-	0
Medical Treatment Injuries	5	-	-	-	5
Other Recordable Injuries	1	-	-	-	1
Lost Time Injuries	0	-	-	-	0
Lost Time Injury Frequency	0	-	-	-	0
Lost Time Injury Severity	0	-	-	-	0

There were no lost time incidents that occurred in the first quarter.

Health and Safety Activities

- **Communications:** OHS and CSSC continued to issue safety bulletins to promote a focus on continuing safety awareness.
- **Education and Training:** Training continued routinely using both in person methods and computer-based learning.
- **Safety Awareness Activities:** The CSSC issued a site safety survey in Q1 to aid in determining safety focus areas for the year.
- **CSSC:** The CSSC committee continues to meet for regulatory meetings.
- **Safety & Industrial Hygiene:** Powered air purifying respirators (PAPR) have been procured to replace the current fleet for site welders and Clean Up (CUP) crew. Training for the new units was completed. The safety group has placed a focus on completing HIRAC assessments and ergonomic assessments in 2023. Scheduling for these assessments is underway.

- **COVID Interruption:** COVID vaccination requirements remain in effect to access PHCF.
- **Total Recordable Injury Rate (TRIR) – Q1 Ending = 2.34** (12 First Aids, 5 medical treatments). Site has more than 3.9 million hours without a Lost Time Injury. Contractor TRIR YTD is 2.31.

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

Quarterly Dose (mSv/quarter)					
ORL Component	Q1 2023	Q2 2023	Q3 2023	Q4 2023	YTD 2023
Air	<0.001	-	-	-	<0.001
Water	<0.001	-	-	-	<0.001
Gamma – Site 1	0.026	-	-	-	0.026
Gamma – Site 2	0.036	-	-	-	0.036
Quarterly Dose – Site 1	0.027	-	-	-	0.027
Quarterly Dose – Site 2	0.037	-	-	-	0.037

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 the first quarter.

Table 15

First Quarter 2023 Public Dose Gamma Monitoring Results					
Station Number	January	February	March	Action Level (µSv/h)	Licence Limit (µSv/h)
2	0.210	0.150	0.170	0.400	0.570
10	0.010	0.030	0.030	0.400	0.610
21	0.060	0.050	0.030	0.250	0.260

Air Emissions

The quarterly average and maximum stack emissions from the UF₆ plant main stack and the UO₂ 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 UF₆ and UO₂ plants.

No licensed action levels were exceeded for uranium emissions from the UF₆ plant main stack in the quarter. The UF₆ 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 UO₂ plant main stack in the quarter. The UO₂ main stack average uranium emission rate was slightly higher than previous quarters as a result of continuous production rates and equipment parameters.

Fluoride emissions from the UF₆ 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. The UF₆ main stack average fluoride emission rate was slightly lower than in previous quarters as a result of maintenance improvements related to the Fabco scrubber system.

The UO₂ main stack is also continuously sampled for ammonia. No licensed action levels were exceeded for ammonia emissions from the UO₂ plant main stack in the quarter. The UO₂ 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	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
UF ₆	Uranium g U/h	280	40	Quarterly Daily Average	2.3	3.8	2.0	1.9	2.5
				Quarterly Daily Maximum	6.7	44.7	6.7	3.7	5.0
	Hydrogen Fluoride g HF/h	650	230	Quarterly Daily Average	22	25	21	12	9
				Quarterly Daily Maximum	98	124	236	201	60
UO ₂	Uranium g U/h	240	10	Quarterly Daily Average	0.5	0.6	0.4	0.5	0.8
				Quarterly Daily Maximum	0.9	1.2	1.2	1.4	1.7
	Ammonia kg NH ₃ /h	58	10	Quarterly Daily Average	2.9	2.6	1.4	2.0	2.3
				Quarterly Daily Maximum	7.7	4.9	3.8	4.3	4.6

Liquid Discharges

The PHCF operates a once-through non-contact cooling water system in support of UF₆ plant operations and harbour water supply quality influences cooling water return quality under normal operating conditions. Ambient water quality can fluctuate based on near-shore Lake Ontario currents, seasonal weather patterns, harbour remedial work and outer harbour sedimentation among other items.

Cooling water return quality data for the UF₆ plant cooling water return (monitoring location UO2N) is summarized in Table 17. The UO₂ plant ceased discharging once-through cooling water to the harbour in late-July 2022 in association with a transition to a closed loop cooling system.

A general decrease in uranium trending was noted from December 2021 through to February 2022 in relation to the interruption of Canadian Nuclear Laboratories (CNL) remedial work within the inner Port Hope harbour over the winter period. Following

resumption of inner harbour dredge activities in March 2022, a corresponding increase in uranium trending was observed. Elevated mean and maximum conditions were observed at monitoring location UO2N for the balance of the 2022 calendar year as a function of on-going inner harbour remedial work. General increases in first quarter 2023 average and maximum uranium concentrations were further recorded relative to the fourth quarter of 2022. Similar trending patterns have been recorded at the PHCF harbour water intake.

An elevated first quarter 2022 maximum fluoride result was recorded for location UO2N relative to typical baseline concentrations and harbour water intake trending in association with harbour water supply challenges and a brief harbour water intake outage experienced in February.

Though ammonia results generally increased in the fourth quarter 2022, decreases are noted in the first quarter 2023. Ammonia is not a parameter of concern with respect to UF₆ plant heat exchanger operations and the cooling water intake also experienced similar trending patterns. Periods of elevated trending are attributed to the accumulation and decomposition of surface water organic matter within the PHCF cooling water works.

Table 17

UO2N Water Quality Data by Quarter							
Parameter	Units of Measure	Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Uranium	µg U/L	Average	48	80	160	140	310
		Maximum	140	280	420	320	730
Fluoride	mg F/L	Average	0.13	0.11	0.10	0.12	0.11
		Maximum	0.76	0.21	0.15	0.33	0.14
Ammonia & Ammonium	mg N/L	Average	0.014	0.014	0.014	0.27	0.067
		Maximum	0.014	0.014	0.028	0.84	0.25
Nitrate	mg N/L	Average	1.2	0.68	0.34	0.89	1.5
		Maximum	1.7	1.7	0.51	1.6	1.9
pH	-	Minimum	8.02	8.12	8.08	8.10	8.14
		Maximum	8.36	8.38	8.76	8.57	8.38

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 18 and 19 summarize uranium concentrations and pH values recorded for the first quarter of 2023.

The daily sanitary sewer action level was reached or exceeded on the January 4, 5, 13 - 15, 17, 18 and March 25, 26 daily monitoring periods. 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 time 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 precipitations events that exacerbated baseline groundwater infiltration conditions.

As a follow-up to fourth quarter 2021 and first quarter 2022 sanitary sewer infrastructure inspections, 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. Several activities are currently planned for the 2023 calendar year, both within and upstream of the licensed facility.

Specific to the licensed facility, Cameco is currently evaluating the replacement and realignment of sewer infrastructure servicing existing facility lift stations and portions of Building 20. Moreover, target areas have been selected for rehabilitation or abandonment planning.

Table 18

Sanitary Sewer Discharge Data by Quarter							
Parameter	Units of Measure	Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Uranium	mg U/L	Average	0.044	0.050	0.022	0.040	0.039
		Maximum	0.14	0.28	0.18	0.094	0.22
pH	-	Minimum	7.18	7.32	7.12	7.56	7.39
		Maximum	8.31	8.20	8.21	8.22	8.84

Table 19

Q1 2023 Monthly Sanitary Sewer Discharges			
Period	Sanitary Sewer Action Level/Release Limit	Monthly Average Uranium Concentration (µg U/L)	Daily Maximum Uranium Concentration (µg U/L)
January	Action Level of 100 µg U/L – daily composite samples	60	220
February		14	30
March	Release Limit of 275 µg U/L – monthly average of daily composite samples	40	130

Ambient Air Monitoring

Table 20 shows the quarterly all-station average and maximum uranium dustfall results from the first quarter of 2022 through to the first quarter of 2023.

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

Table 20

Uranium in Dustfall Results by Quarter (mg U/m²/30 days)					
Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Average	<0.1	0.1	0.2	0.2	<0.1
Maximum	0.1	0.4	1.7	1.3	0.1
Internal Administrative Screening Level = 10 mg U/m ² /30 days					

Table 21 summarizes the average and maximum uranium hi-vol results from the first quarter of 2022 through to the first quarter of 2023.

A UF₆ plant fluid bed filter issue (CIRS # PHCF-2023-000056) caused elevated U results at Marsh Street and Waterworks high volume air sampling stations on January 9 and 10, 2023. The highest Cameco hivol result was 0.381 ug U/m³ TSP which is at the AAQC for 24 hr U in TSP, and below the MECP DAV reportable level of 1.5 ug U/m³ for 24 hr).

Table 21

Uranium-in-Air Concentration at Hi-Vol Stations by Quarter (µg U in TSP/m³)					
Quarter	Result	Waterworks	Shuter Substation	Marsh Street	Hayward Street
Q1 2022	Average	0.001	0.001	0.003	0.002
	Maximum	0.017	0.014	0.018	0.014
Q2 2022	Average	0.002	0.002	0.004	0.003
	Maximum	0.012	0.036	0.031	0.012
Q3 2022	Average	0.001	0.001	0.004	0.001
	Maximum	0.003	0.008	0.025	0.005
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
Average <0.06 µg U in TSP/m ³ (annual) AAQC					
Maximum <0.3 µg U in TSP/m ³ (24 hr) AAQC					

Table 22 shows the quarterly all-station average and maximum fluoride dustfall results from the first quarter of 2022 through to the first quarter of 2023.

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

Table 22

Fluoride in Dustfall Results by Quarter (mg F/m²/30 days)					
Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Average	0.9	1.5	0.4	0.8	0.6
Maximum	10	9.9	4.1	4.2	5.3
Internal Administrative Screening Level = 20 mg F/m ² /30 days					

Table 23 shows the average and maximum lime candle results from the first quarter of 2022 through to the first quarter of 2023. The average results are comparable to levels observed in the previous quarters.

Table 23

Monthly Lime Candle Results by Quarter (µg F/100 cm²/30 days)					
Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Average	4	4	4	2	3
Maximum	11	12	7	4	4
The desirable ambient air quality criteria for lime candles are to protect forage crops consumed by livestock. During the summer growing season, the criteria is 40µg F/100cm ² /30 days, changing to 80µg F/100cm ² /30 days in winter					

Ambient Water Quality Monitoring

A summary of harbour water intake (SCI) water quality data is presented in Table 24. Consistent with the production facility returns trending, general decreases in first quarter 2022 average and maximum uranium concentrations were recorded relative to the fourth quarter 2021. Following resumption of CNL inner harbour dredge activities in March 2022, a corresponding increase in uranium trending was observed. Elevated mean and maximum conditions were observed for the balance of the 2022 calendar year as a function of the on-going inner harbour remedial work. General increases in first quarter 2023 average and maximum uranium concentrations were further recorded relative to the fourth quarter of 2022.

Though ammonia results generally increased in the fourth quarter 2022, decreases are noted in the first quarter 2023. Periods of elevated trending are attributed to the

accumulation and decomposition of surface water organic matter within the PHCF cooling water works.

Table 24

SCI Water Quality Data by Quarter							
Parameter	Units of Measure	Value	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023
Uranium	µg U/L	Average	52	85	180	160	340
		Maximum	160	280	500	360	740
Fluoride	mg F/L	Average	0.11	0.11	0.099	0.11	0.11
		Maximum	0.17	0.22	0.19	0.16	0.14
Ammonia & Ammonium	mg N/L	Average	0.014	0.014	0.019	0.13	0.020
		Maximum	0.014	0.014	0.46	0.76	0.14
Nitrate	mg N/L	Average	1.2	0.72	0.42	1.2	1.7
		Maximum	1.8	1.4	0.65	1.9	2.1
pH	-	Minimum	8.02	8.09	8.04	7.94	8.13
		Maximum	8.36	8.46	8.74	8.60	8.34

Cooling Water Intake – Visual Inspections

Table 25 below presents all non-conformities observed during daily visual inspections of the cooling water intake system.

Table 25

Date	Quantity of Fish Observed	Observations
January	0	No fish were observed during daily checks.
February	0	No fish were observed during daily checks.
March 8	2	2 small fish approximately two inches in length were observed on March 8. It is believed that the fish were washed into the pit as a result of heavy wave action.

5.0 Public Information Program

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

Public Engagement

Cameco sponsored the Cobourg Winterfest Event on January 28.

Cameco hosted a booth at the Durham College Oshawa Campus job fair on February 2.

The winter issue of Energize was mailed out to residents of Port Hope in the second week of February. A digital version was also posted on the Cameco website on February 13. Stories in this issue included: Cameco Fuel Manufacturing granted 20-year licence by the CNSC; Cameco's Port Hope Conversion Facility recognized for strong safety performance; Port Hope community survey results show strong support for Cameco Corporation; Vision in Motion update; Cameco announces over \$50,000 for local mental health initiatives.

Cameco attended the Canadian Nuclear Association's annual conference from February 21 – 24 in Ottawa, ON. Cameco representatives staffed a booth and shared information about its operations and activities with conference attendees.

On March 2, Cameco announced that its 5K Step Up for Mental Health fun run/walk was returning as an in-person event in Cobourg. A news release was issued and posted to camecofuel.com.

Cameco sponsored and attended the Northumberland Chamber Business Awards on March 24 and presented the Communications & Technology Award.

Cameco provided free advertising to local charitable organizations with its sponsorship of MyFM's Community Partner Program. Through the quarter, Five Counties Children's Centre, Northumberland Big Brothers, Big Sisters and Northumberland Fare Share Food Bank benefitted from this sponsorship by receiving advertising.

Public Disclosure

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

Posting Date	January 9, 2023
Incident Date	January 4-5, 2023
Incident	Environmental Action Level Met on January 4 and 5, 2023
Details	<p>The daily sanitary sewer discharge recorded a value of 100 µg/L on January 4 and 5, 2023 which meets the uranium sanitary sewer action level of 100 µg/L.</p> <p>Facility discharge quality remains well below the sanitary sewer uranium limit of 275 µg/L (monthly average).</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	<p>Groundwater infiltration, influenced by recent warmer temperatures creating a snow and ground thaw along with rain events are the likely cause.</p> <p>Cameco notified the Canadian Nuclear Safety Commission and the Municipality of Port Hope.</p>
Cameco Environmental Effect Rating	1

Posting Date	January 12, 2023
Incident Date	January 12, 2023
Incident	Reportable Spill
Details	<p>A small amount of fluid (<1L) leaked from a transport truck while it was being loaded. The substance is suspected to be transmission fluid.</p> <p>The surface runoff resulting from the rain that was occurring, carried the substance to a nearby catch basin.</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	<p>Oil absorbent pads were applied in the area to isolate the catch basin. The transport left the site, and the area has been cleaned up.</p> <p>Cameco notified the Canadian Nuclear Safety Commission and the Ministry of the Environment, Conservation and Parks.</p>
Cameco Environmental Effect Rating	1
Posting Date	January 17, 2023
Incident Date	January 13, 14 and 15, 2023
Incident	Environmental Action Level Exceedance
Details	<p>The daily sanitary sewer discharge recorded a value of 110 µg/L on January 13, 2023, a value of 220 µg/L on January 14, 2023 and a value of 190 µg/L on January 15, which exceed the uranium sanitary sewer action level of 100 µg/L.</p> <p>Facility discharge quality remains well below the sanitary sewer uranium limit of 275 µg/L (monthly average).</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	<p>Groundwater infiltration is the likely cause.</p> <p>Cameco notified the Canadian Nuclear Safety Commission and the Municipality of Port Hope.</p>
Cameco Environmental Effect Rating	1

Posting Date	January 25, 2023
Incident Date	January 17-18, 2023
Incident	Environmental Action Level Exceedance
Details	<p>The daily sanitary sewer discharge recorded a value of 140 µg/L on January 17 and a value of 150 µg/L on January 18, 2023, which exceed the uranium sanitary sewer action level of 100 µg/L.</p> <p>Facility discharge quality remains well below the sanitary sewer uranium limit of 275 µg/L (monthly average).</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	<p>An investigation into the cause is underway.</p> <p>Cameco notified the Canadian Nuclear Safety Commission and the Municipality of Port Hope.</p>
Cameco Environmental Effect Rating	1
Posting Date	March 28, 2023
Incident Date	March 25 and 26, 2023
Incident	Environmental Action Level Exceedance
Details	<p>The daily sanitary sewer discharge recorded a value of 130 µg/L on March 25 and a value of 110 µg/L on March 26, 2023, which exceed the uranium sanitary sewer action level of 100 µg/L.</p> <p>Facility discharge quality remains well below the sanitary sewer uranium limit of 275 µg/L (monthly average).</p> <p>There was no health or safety risk posed to the public, workers or the environment.</p>
Corrective Action	<p>Groundwater infiltration, influenced by recent warmer temperatures creating a snow and ground thaw along with rain events are the likely cause.</p> <p>Cameco notified the Canadian Nuclear Safety Commission and the Municipality of Port Hope.</p>
Cameco Environmental Effect Rating	1

Social Media

Cameco Ontario's Facebook community grew by 19 new followers to 1,072 page likes at the end of the quarter. Cameco Ontario's 32 posts covered information such as:

- Announced the Cameco Fuel Manufacturing had received a 20-year licence from the CNSC
- Promoted community partners, including Five Counties Children's Centre, Big Brothers Big Sisters Northumberland and the Fare Share Food Bank
- Notified residents of alarm testing at PHCF
- Promoted Cameco's attendance at career fairs including the Curve Lake Alternate Routes Career Fair on January 19 and the Durham College job fair on February 2
- Supported Bell Let's Day on January 25
- Promoted Cameco sponsored events, such as the Cobourg Winterfest, Community Care Handbags for Hospice, the Winter Tea Fundraiser for St. Joseph School in Blind River, and the Northumberland Central Chamber of Commerce Business Achievement Awards
- Recognized International Day of Women and Girls in Science with a series of posts featuring Cameco women working in STEM
- Announced the return of the Step Up for Mental Health 5K event
- Shared the winter 2023 issue of Energize
- Promoted Career opportunities at Cameco
- Shared Cameco photos from the Canadian Nuclear Association Conference in Ottawa
- Posted a timelapse video of the work being completed for the removal of building 27 as part of the Vision in Motion project at the Port Hope Conversion Facility
- Celebrated International Women's Day on March 8
- The signing of Cameco's deal to supply UF₆ to Energoatom in Ukraine

By the end of the quarter the Instagram account had grown by 38 new followers for a total of 756 followers. Photos and information featured were similar to the Cameco Facebook page.

Indigenous Engagement

Cameco attended the Curve Lake First Nation Alternative Routes Fair on January 19. Cameco highlighted career openings and information about Cameco's operations and career opportunities.

Cameco representatives attend the Curve Lake First Nation Consultation Committee Meeting on February 13. The meeting was part of the relationship building between Cameco and Curve Lake and review of plans to move forward.

Regular meetings with Curve Lake First Nation took place on January 25 and March 29. The meetings covered a review of 2022 and key focus areas for 2023. Cameco also provided an update on Vision in Motion activities.

Regular meetings with Scugog Island First Nation took place on February 16 and March 31. Cameco provided a full presentation on Cameco's operations and activities as a recap for meeting attendees who are newer to the regular meetings.

Public disclosures are emailed to Curve Lake and Scugog Island and then discussed at the next available meeting.

On January 4, Q3 Reports were emailed to Curve Lake, Scugog Island, Alderville, Hiawatha and Rama First Nations and the Mohawks of the Bay of Quinte.

On March 10, Cameco emailed the Q4 Compliance Reports, winter edition of Energize and the Step Up news release to Curve Lake, Scugog Island, Alderville, Hiawatha and Rama First Nations and the Mohawks of the Bay of Quinte.

Website

The Winter 2023 edition of Energize was posted.

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

A news release announcing the return of Cameco Step Up for Mental Health 5K was posted.

- [Cameco Announces the Return of Step Up for Mental Health 5K Fun Run/Walk - News Archive - Media - Cameco Fuel Services](#)

Public Disclosures: Five public disclosures were posted to the website [Environment & Safety - Conversion: Port Hope - Fuel Services - Businesses - Cameco](#)

Media Analysis

Cameco received the below media coverage on its Step Up for Mental Health initiative:

- **Cameco's Step Up for Mental Health 5K Fun Run/Walk returns as in-person event May 13** – March 12, 2023 – Northumberlandnews.com
 - [Cameco's Step up for Mental Health event returns May 13 \(northumberlandnews.com\)](https://www.northumberlandnews.com/news/cameco-step-up-for-mental-health-event-returns-may-13)
- **Cameco's Step Up for Mental Health 5K Fun Run/Walk returns as in-person event May 13** – March 12, 2023 – ThePeterboroughexaminer.com
 - [Cameco's Step Up for Mental Health 5K Fun Run/Walk returns as in-person event May 13 | ThePeterboroughExaminer.com](https://www.thepeterboroughexaminer.com/news/cameco-step-up-for-mental-health-5k-fun-run-walk-returns-as-in-person-event-may-13)
- **Cameco's Step Up for Mental Health 5K returns to in-person event** – May 16, 2023 – Gonorthumberland.ca
 - [Cameco's Step Up for Mental Health 5k returns to in-person event | 93.3 myFM \(gonorthumberland.ca\)](https://www.gonorthumberland.ca/news/cameco-step-up-for-mental-health-5k-returns-to-in-person-event)
- **COMMUNITY SPOTLIGHT: Step Up for Mental Health this Saturday** – Brightontoday.ca – May 10, 2023
 - [COMMUNITY SPOTLIGHT: Step Up for Mental Health this Saturday | Brighton Today.ca](https://www.brightontoday.ca/news/step-up-for-mental-health-this-saturday)

Communication Products

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

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

A news release announcing the return of Cameco Step Up for Mental Health 5K was issued to local media and posted on the website.

- [Cameco Announces the Return of Step Up for Mental Health 5K Fun Run/Walk - News Archive - Media - Cameco Fuel Services](#)

6.0 Other Matters of Regulatory Interest

6.1 Vision in Motion

VIM engineering activities continued for building 72 (new warehouse), the large excavation to be completed west of the turning basin, and warehouse demolition (buildings 6, 7, 12, 12A). Work packages for building 14 and 15 demolition bids were completed. Collaborative engineering work with the Municipality of Port Hope was in-progress for stormwater systems in the vicinity of Eldorado Place and the Cameco parking lot.

Regular coordination continued with CNL regarding future remediation activities with shared responsibilities at the Centre Pier and near the Cameco fence line along the harbour.

Construction of the scaffolding around the exterior of the building 27 tower was completed, and the building enclosure tarping system was in-progress. Inside the building removal of the ventilation shaft and interior block walls was completed, and construction at the electrical room (a portion of building to remain) was in-progress. In building 5B, equipment removal progressed well.

Packaged waste shipments to the LTWMF continued. Delivery of materials in roll-off bins is still not permitted and projected LTWMF readiness for roll-off bins slipped from February to June during the quarter, requiring the project to consider alternative delivery methods for building demolition wastes.

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 first quarter related to VIM activities; however, elevated dust trak results and high-volume air sampler total suspended particulates (TSP) were recorded in February and March 2023 as a result of CNL harbour and viaduct remediation activities near PHCF.

7.0 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 first 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 first quarter of 2023.

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