



**CAMECO RESOURCES  
CROW BUTTE OPERATION**

**86 Crow Butte Road  
P.O. Box 169  
Crawford, Nebraska 69339-0169**

**(308) 665-2215  
(308) 665-2341 – FAX**

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August 27, 2025

ATTN: Document Control Desk Director  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Semiannual Radiological Effluent and Environmental Monitoring Report  
Source Materials License No. SUA-1534, Docket No. 40-8943

Dear Document Control:

Enclosed please find one copy of the Semiannual Radiological Effluent and Environmental Monitoring Report for the Crow Butte Uranium Project. The report is provided in accordance with License Condition 11.1(B) of Source Materials License SUA-1534 and 10 CFR Part 40. This report covers the first and second quarters of 2025.

If you have any questions concerning the report, please feel free to call me at (308) 665-2215 Ext 117.

Sincerely,  
CAMECO RESOURCES  
CROW BUTTE OPERATION

Casey Yada  
SHEQ Coordinator

cc: Tom Lancaster – NRC  
CBO – File  
cc: Daniel Kroll – NDEE Program Coordinator  
CR – Electronic File



**CAMECO RESOURCES  
CROW BUTTE OPERATION**

**First Half 2025 Semiannual Radiological Effluent  
and Environmental Monitoring Report**

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**CROW BUTTE URANIUM PROJECT**

**RADIOLOGICAL EFFLUENT  
AND  
ENVIRONMENTAL MONITORING  
REPORT**

**for**

**FIRST AND SECOND QUARTERS, 2025**

**USNRC Source Materials License SUA 1534**



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CROW BUTTE OPERATION**

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### 1 WATER QUALITY MONITORING DATA

#### 1.1 Excursion Monitoring

Biweekly excursion monitoring in the shallow aquifer and perimeter monitor wells was continued in Mine Units 2 through 11 during the first and second quarters of 2025. There were no wells placed on excursion status during the reporting period.

#### 1.2 Water Supply Wells and Surface Water

Summary sheets of quarterly radiological analytical data for the reporting period from all surface waters and water supply wells within one kilometer of the active wellfield boundary are included in Appendix A.

The reported radiological data are within the expected ranges for each well and surface water sampling points. Samples were obtained from all sample locations with the exceptions noted in Appendix A.

#### 1.3 Mine Units 8-11 Semi-annual Trunk-line Sampling Data

In response to a request for additional information related to the alternate decommissioning request, CBO proposed adding a table to the Semi-annual report that includes trunk-line sampling data for Mine Units 8-11. One sample will be collected each reporting period (half-year), and the table will be updated with this information.

Date	U308 ppm	V ppm	CO3 ppm	Alk ppm	pH	Ca ppm	Na ppm	Cl ppm	SO4 ppm	COND.
May-18	5.7	0.3	1111	926	7.4	74	974	414	880	4607
Nov-18	8.4	0.3	1157	964	7.4	77	975	404	893	4511
May-19	7.2	0.3	1201	1001	7.4	108	1007	427	932	4853
Nov-19	6.5	0.3	1119	933	7.3	75	926	365	839	4403
May-20	11.7	0.8	1238	1032	7.4	90	1039	381	982	4850
Nov-20	11.4	0.2	1247	1039	7.3	108	1033	353	1088	4854



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<b>May-21</b>	5.2	0.12	1050	875	7.38	85	895	301	964	4240
<b>Nov-21</b>	5.2	0.1	1145	954	7.4	96	993	329	1030	4550
<b>May-22</b>	5.4	0.21	1140	950	7.25	94	913	319	946	4380
<b>Nov-22</b>	5.7	0.23	1077	897	7.25	90	891	316	924	4310
<b>May-23</b>	6.1	0.17	1017	848	7.47	84	853	304	879	4037
<b>Nov-23</b>	5.5	0.17	999	833	7.41	76	787	297	815	3891
<b>May-24</b>	7.1	0.2	853	642	7.6	50	600	220	616	3057
<b>Nov-24</b>	7.1	0.37	842	729	7.32	56	661	234	629	3268
<b>May-25</b>	7.1	0.17	853	723	7.61	50	600	220	616	3057

## 2 OPERATIONAL

### 2.1 Production Data Summary

Mining operations continued through the first and second quarters of 2025. The average operating production flow rate was 88 gpm for the first quarter and 91 gpm for the second quarter. Injection and production totals from the totalizers and the calculated bleed totals for the reporting period are included in Appendix B. Production injection pressures are included in Appendix C.

### 2.2 Restoration

Restoration activities continued in Mine Units 2, 3, 4, 5, 6, 7, and 8 during the first half of 2025. Permeate continued to be injected into Mine Units 7 and 8. Stability monitoring was initiated in Mine Units 3 and 5 during the third quarter of 2018. Stability monitoring was initiated in Mine Units 2 and 4 during the first quarter of 2022. Mine Unit 6 entered stability monitoring during the first quarter of 2023. Stability monitoring continued in these mine units during the reporting period. Permeate injection began in April 2021 in Mine Unit 8. Restoration injection and production totals are included in Appendix B. Restoration injection pressures are included in Appendix C.



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#### **2.3 Wastewater Summary**

The total volume of wastewater discharged to the ponds was 446,610 gallons during the first quarter and 543,880 gallons during the second quarter. Currently, all five evaporation ponds contain wastewater.

Wastewater that is not disposed of in the evaporation ponds is injected into the two Deep Disposal Wells (DDWs). Currently, the wells are operated on a nearly continuous basis and 49,913,943 gallons of wastewater was injected into the wells during the first half of 2025. A summary of the total volume of wastewater injected and the average radionuclide content is contained in Appendix D.

#### **2.4 Effluent Release**

10 CFR §40.65 requires licensees to report quantities of radionuclides in liquid and gaseous effluent releases to the environment. In the Application for Renewal of Source Materials License SUA-1534, submitted December 1995, Table 7.3(A) presented calculations of the annual radon emissions for the Crow Butte Plant. These calculations assumed a  $7.04 \times 10^{-4}$  Curies/m<sup>3</sup> radon release from leaching operations and the radon release calculations for the first half of 2025 use this release rate estimate.

During the first quarter, production occurred at an average flow rate of 88 gpm (333 lpm). Production was maintained continuously for 90 days during the first quarter with an operating factor of 100%. The production flow for the first quarter results in a calculated radon release of 22 Curies. During the second quarter, production occurred at an average flow rate of 91 gpm (344 lpm). Production was maintained continuously for 91 days during the second quarter with an operating factor of 100%. The production flow for the second quarter results in a calculated radon release of 23 Curies. Calculations for radon release from production operations are shown in Appendix E.

There were no additional wells brought online during the first half of 2025.

The total radon emission due to leaching operations from the Crow Butte plant for the first half of 2025 was 45 Curies. This calculated release rate is comparable with the releases estimated in CBO's License Renewal Application.

Radon gas is also released from restoration activities. For restoration water that is treated by ion exchange only, the radon concentration is 0.697  $\mu$ Ci/l. Of the total restoration production flow, it is assumed that 25% of the radon is released through wellfield loss and 10% of the remaining radon is released during pressurized ion exchange treatment. For water that is treated by reverse osmosis, it



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is assumed that 100% of the remaining radon is released. For water treated by reverse osmosis the radon concentration is 0.470  $\mu\text{Ci/l}$  after adjusting for wellfield loss and ion exchange loss.

During the first half of 2025 a total of 135,203,293 gallons (460,210,767 liters) of restoration water was produced from Mine Units 2, 3, 4, 5, 6, 7, and 8. Based upon an estimated radon concentration of 0.697  $\mu\text{Ci/l}$ , the total amount of radon in the restoration solution was calculated to be 321 Curies as shown in Appendix E. The estimated release of radon through wellfield loss at 25% of this total was 80 Curies. The plant loss for ion exchange treatment of the restoration water is estimated at 10% of the remaining radon, or 28 Curies. For water that is treated by reverse osmosis, it is assumed that 100% of the remaining radon is released. For water treated by reverse osmosis the radon concentration is 0.470  $\mu\text{Ci/l}$  after adjusting for wellfield loss and ion exchange loss.

Of the total amount of restoration water produced in the first half of 2025, 121,574,880 gallons (460,210,767 liters) of the water was treated by reverse osmosis. The total estimated radon release from reverse osmosis treatment was 24 Curies.

Based upon the calculations shown in Appendix E, the total estimated semiannual radon emission for the first half of 2025 from restoration activities was 128 Curies. This resulted in a total estimated radon release from the leaching operation during the first half of 2025 of 173 Curies.

This information is included for historical purposes as a comparison for the requirements in License Condition 11.11.

### **2.5 License Condition 11.11**

By letter dated January 6, 2016, the NRC staff indicated that it had completed the technical review of the licensee's January 2, 2015 submittal describing the site's operational airborne effluent and environmental monitoring program.

The licensee identified three primary sources of airborne effluents at the Crow Butte Project. These sources included the main plant, wellfield, and the wellhouses.

#### Main Plant



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#### *Radon and radon progeny*

The licensee will measure ambient radon gas concentrations using track etch detectors and working level measurements at six different locations.

The licensee will use scintillation cell measurements quarterly at each tank vent for radon gas measurements.

#### *Particulates*

The licensee shall conduct isotopic analyses for alpha- and beta-emitting radionuclides on airborne samples at each in-plant air particulate sampling location at a frequency of once every six months for the first two years after the license renewal (November 2014) and annually thereafter to ensure compliance with 10 CFR 20.1204(g). For any changes to operations, the licensee shall conduct an evaluation to determine if more frequent isotopic analyses are required for compliance with 10 CFR 20.1204(g).

There were no changes made to the operation during the first half of 2025. Samples were collected from each of the in-plant air particulate sampling locations.

The summary of the Main Plant samples are shown in Appendix F.

#### Wellfield

The licensee identified two potential sources of radon in the wellfield. The first potential source of radon is when wellheads are opened to the atmosphere to depressurize a wellhead that has become pressurized. When these wellheads are depressurized, the licensee will obtain a grab sample using a scintillation cell. Wellhead pressurization occurs as a result of adding oxygen to the injection stream. Since CBO did not add oxygen to the injection stream during the reporting period, no wells became pressurized during the first half of 2025, so no scintillation cell grab samples were collected from pressurized wellheads during the period.

The other potential sources of radon in the wellfield include unplanned releases of process fluids from spills. The amount of radon released will be estimated based on the amount of fluid released and an estimate of the concentration of radon in the process fluid. The licensee will assume that all radon in the fluid is released to the atmosphere.

The summary of the Wellfield samples are shown in Appendix G.

#### Wellhouses



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#### *Radon and radon progeny*

The licensee will measure radon in the wellhouses using track etch detectors with a six-month exposure time. The licensee will use the average radon concentration (collected quarterly) along with the flow rate of the wellhouse exhaust fans to determine the total radon released from the wellhouses. Four production and four restoration wellhouses will be monitored annually in this manner.

Radon daughters will be measured semi-annually in the wellhouses where radon gas is being measured. The licensee will determine the total radon daughters released in the same manner as the radon gas using the flow rate of the wellhouse exhaust fan.

#### *Particulates*

The licensee will estimate the emission of particulate releases based on isotopic analyses of semiannual air particulate samples performed in each of the wellhouses that are monitored for radon. The exhaust rate of the wellhouses will be the same as described above for the radon emissions.

The summary of the Wellhouse samples are shown in Appendix H.

Estimated emissions for the first half of the year are summarized in the following table. The estimated emissions are 448.55 curies.



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**First Half of Year**

**Emissions in Ci for First 6 Months by  
Source**

Source	Radon Progeny (Ci)	Radon Gas (Ci)	Particulate (Ci)	Total by Source	% by Source
Plant Floor Vents	0.26	1.22	3.60E-05	<b>1.49</b>	<b>0.3%</b>
Wellhouses (64)	0.28	1.46	1.71E-05	<b>1.74</b>	<b>0.4%</b>
Plant Tanks/vents	58.5	386.8	N/A	<b>445.3</b>	<b>99.3%</b>
Spills	N/A	6.53E-04	N/A	<b>6.53E-04</b>	<b>0.0%</b>
Deepwells	N/A	N/A	6.46E-07	<b>6.46E-07</b>	<b>0.0%</b>
<b>Total by Type</b>	<b>59.08</b>	<b>389.47</b>	<b>5.37E-05</b>		

**Estimated Emissions for First Half of the  
Year =**

**448.55**

**Curies (Ci)**

**3 ENVIRONMENTAL MONITORING**

**3.1 Air Monitor Stations**

Eight air monitoring stations are used to monitor the Crow Butte Plant. Ambient radon-222 concentrations and radionuclide concentrations in air for each monitoring site are listed in Appendix I. Six track etch cups were deployed at the background monitoring station and the nearest residence to check for potential variability in data using only one track etch cup. At the time of this writing, the results for the second quarter of 2025 were not available. The second quarter results will be submitted under a second cover letter once they become available. The third party lab indicates the results will be available in mid-September, 2025. All air monitoring results for the first quarter were within expected historical ranges.

**3.2 TLD Monitors**



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Environmental TLD monitors are located at each air monitoring station. The results of the area TLD monitors fall within the expected ranges and are listed in Appendix J.

The site is provided with both a deployment and a transient dosimeter by the provider. The process used by the dosimeter provider, Landauer, is to subtract the deployment badge result from the badges used for environmental monitoring. If the deployment badge is lost, damaged, etc. the transient badge result is subtracted instead. If neither is available to be read, the average of a set number of previous quarter's background results is subtracted. Only one of the badge results is subtracted, not multiple. The purpose of these deployment and transient badges is to subtract off any radiation that was accumulated on the environmental badges during times when they were not deployed to ensure that only dose accumulated while in the prescribed monitoring location is returned to the site as a final result.

### 3.3 Mechanical Integrity Testing (MIT)

Mechanical integrity tests shall be performed on each injection and production well before the wells are utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Additionally, each well shall be retested at least once each five (5) years it is in use. The following table summarizes the MIT's performed during the first half of 2025.

<b>Five (5) Year Retesting</b>			
<b>Required Testing</b>	<b>Number Tested</b>	<b>Number Passed</b>	<b>Number Failed</b>
834	1014	1014	0

<b>Wells Serviced</b>			
<b>Required Testing</b>	<b>Number Tested</b>	<b>Number Passed</b>	<b>Number Failed</b>
1	1	1	0

**Appendix A**

**Private Well and Surface Water Radiological Monitoring Results**

**First and Second Quarters, 2025**

**CROW BUTTE RESOURCES, INC.**

**PRIVATE WELL AND SURFACE WATER RADIOLOGICAL MONITORING RESULTS**

**First Quarter, 2025**

<b>SAMPLE ID</b>	<b>DATE SAMPLED</b>	<b>URANIUM mg/l</b>	<b>URANIUM µCi/ml</b>	<b>RADIUM-226 pCi/l</b>	<b>RADIUM-226 precision ±</b>
Well #8	03/11/25	0.0145	9.80E-09	0.7	0.1
Well #11	03/11/25	0.0079	5.40E-09	0.4	0.1
Well #12	03/11/25	0.0033	2.20E-09	0.4	0.1
Well #26	03/10/25	0.0059	4.00E-09	0.2	0.1
Well #28	03/10/25	0.0060	4.10E-09	0.2	0.1
Well #38	Off	Off	Off	Off	Off
Well #41	03/12/25	0.0076	5.20E-09	<0.2	0.1
Well #61	03/12/25	<0.0003	<2.00E-10	3.0	0.2
Well #63	03/11/25	0.0176	1.19E-08	0.3	0.1
Well #66	03/11/25	0.0215	1.46E-08	0.3	0.1
Well #125	03/11/25	0.0063	4.30E-09	<0.2	0.05
Well #129	03/11/25	0.0080	5.40E-09	<0.2	0.1
Well #131	03/12/25	0.0053	3.60E-09	<0.2	0.1
Well #133	03/11/25	0.0089	6.00E-09	0.2	0.1
Well #134	03/11/25	0.0080	5.40E-09	0.2	0.1
Well #135	03/10/25	0.0176	1.19E-08	0.3	0.1
Well #138	03/11/25	0.0127	8.60E-09	0.4	0.1
Well #140	03/10/25	0.0107	7.20E-09	0.3	0.1
Well #435	03/12/25	0.0069	4.70E-09	0.2	0.1
Well #445	03/12/25	0.0112	7.60E-09	0.2	0.1
Drinking Water Well	03/11/25	0.0078	5.30E-09	0.7	0.1
Stream S-1	03/10/25	0.0040	2.70E-09	<0.2	0.1
Stream S-2	03/10/25	0.0038	2.60E-09	<0.2	0.1
Stream S-5	03/10/25	0.0044	3.00E-09	<0.2	0.1
Stream E-1 & E-2(Composite)	03/10/25	0.1410	9.55E-08	1.1	0.1
Stream E-5	03/10/25	0.0151	1.02E-08	0.5	0.1
					0
Impoundment I-3	03/10/25	0.033	2.20E-08	0.3	0.1
Impoundment I-4	03/10/25	0.0344	2.33E-08	0.3	0.1
Impoundment I-5	03/10/25	0.0170	1.15E-08	0.7	0.1
<b>Reporting Limit</b>		<b>0.0003</b>	<b>2.00E-10</b>	0.2	-

ND-Not detected at the reporting limit

**CROW BUTTE RESOURCES, INC.**

**PRIVATE WELL AND SURFACE WATER RADIOLOGICAL MONITORING RESULTS**

**Second Quarter, 2025**

<b>SAMPLE ID</b>	<b>DATE SAMPLED</b>	<b>URANIUM mg/l</b>	<b>URANIUM µCi/ml</b>	<b>RADIUM-226 pCi/l</b>	<b>RADIUM-226 precision ±</b>
Well #8	06/02/25	0.0152	1.03E-08	0.4	0.1
Well #11	Off	Off	Off	Off	Off
Well #12	06/03/25	0.0032	2.20E-09	0.2	0.1
Well #26	06/02/25	0.0055	3.70E-09	0.4	0.1
Well #28	06/02/25	0.0056	3.80E-09	0.2	0.1
Well #38	06/02/25	0.0049	3.30E-09	<0.2	0.1
Well #41	06/03/25	0.0066	4.50E-09	<0.2	0.1
Well #61	06/03/25	<0.0003	<2.00E-10	2.6	0.2
Well #63	06/03/25	0.0169	1.14E-08	0.3	0.1
Well #66	06/03/25	0.0221	1.50E-08	0.3	0.1
Well #125	06/03/25	0.0065	4.40E-09	<0.2	0.1
Well #129	06/03/25	0.0075	5.10E-09	<0.2	0.1
Well #131	06/03/25	0.0053	3.60E-09	0.2	0.1
Well #133	06/03/25	0.0082	5.60E-09	0.3	0.1
Well #134	06/03/25	0.0081	5.50E-09	0.3	0.1
Well #135	06/03/25	0.0175	1.18E-08	0.3	0.1
Well #138	06/03/25	0.0129	8.70E-09	0.3	0.1
Well #140	06/02/25	0.0089	6.00E-09	0.3	0.1
Well #435	06/03/25	0.0069	4.70E-09	<0.2	0.1
Well #445	06/03/25	0.0095	6.40E-09	0.2	0.1
Drinking Water Well	06/03/25	0.0085	5.80E-09	0.3	0.1
Stream S-1	06/02/25	0.0040	2.70E-09	0.3	0.1
Stream S-2	06/02/25	0.0034	2.30E-09	<0.2	0.04
Stream S-5	06/02/25	0.0036	2.40E-09	<0.2	0.05
Stream E-1 & E-2(Composite)	06/02/25	0.0110	7.50E-09	0.2	0.1
Stream E-5	06/02/25	0.0030	2.00E-09	<0.2	0.1
					0
Impoundment I-3	06/02/25	0.007	4.50E-09	<0.2	0.1
Impoundment I-4	06/02/25	0.0039	2.60E-09	0.2	0.1
Impoundment I-5	06/02/25	0.0053	3.60E-09	<0.2	0.1
<b>Reporting Limit</b>		<b>0.0003</b>	<b>2.00E-10</b>	0.2	-

ND-Not detected at the reporting limit

**Appendix B**

**Plant Production and Waste Totals**

**First and Second Quarters, 2025**

## First Quarter 2025

WASTE VOLUME							
TOTALIZER	PLANT TO PONDS	PLANT TO DDW 1 & 2	RESTORATION TO DDW	CLEAN WATER INTO PLANT	DDW TOTAL INJECTED	TRUCKS TO POND	POND WATER TREATMENT
January	193,560	5,103,974	3,952,800	15,000	9,056,774		
August	112,270	4,394,846	3,664,800	15,000	8,059,646		
September	140,780	3,581,158	4,229,280	15,000	7,810,438		
<b>TOTAL GAL. EOQ</b>	446,610	13,079,978	11,846,880	45,000	24,926,858	0	0

<b>DISCHARGED TO WASTE PONDS LESS POND WATER TREATMENT GALLONS =</b>	446,610	GALLONS
<b>DISCHARGED TO DEEP WELL=</b>	24,926,858	GALLONS
<b>DISCHARGED TO WASTE PONDS + DPWELL =</b>	25,373,468	GALLONS
<b>WF BLEED FROM WELLFIELDS=</b>	25,328,468	GALLONS

COMMERCIAL WELLFIELD BLEED			
MONTH	January	February	March
<b>BLEED</b>	100.0%	100.0%	100.0%

RESTORATION WELLFIELD BLEED			
MONTH	January	February	March
<b>BLEED</b>	22.3%	21.2%	20.1%

PLANT FLOW	
<b>AVERAGE OPERATING FLOW RATE=</b>	88 GPM EOQ GALLONS
<b>TOTAL GALLONS PRODUCED=</b>	11,345,143 EOQ GALLONS
<b>TOTAL GALLONS INJECTED=</b>	0 EOQ

	TOTAL GALS. PRODUCED	TOTAL GALS. INJECTED	HOURS IN MONTH	HOURS IN PRODUCTION	AVERAGE PROD. GPM	AVERAGE COM INJ GPM	AVERAGE REST INJ GPM	HRS. DOWN TIME
Prev. YTD	14,482,576	0	4,368	4,272	55	0	407	96
January	4,208,997	0	744	744	94	0	308	0
February	3,344,250	0	672	672	83	0	333	0
March	3,791,896	0	744	744	85	0	394	0
<b>EOQ TOTAL</b>	11,345,143	0	2,160	2,160	88	0	345	0
<b>YTD TOTAL</b>	11,345,143	0	2,160	2,160	88	0	345	0

	TOTAL MU 2 GALS SAMPLED	TOTAL MU 3 GALS SAMPLED	TOTAL MU 4 GALS SAMPLED	TOTAL MU 5 GALS SAMPLED	TOTAL MU 6 GALS SAMPLED	TOTAL MU 7 GALS PRODUCED	TOTAL MU 8 GALS PRODUCED
Prev. YTD	0	0	0	0	0	0	0
January	24,044	0	37,141	0	0	0	17,758,920
February	0	17,850	0	82,525	71,371	0	17,312,305
March	0	0	0	0	0	38,820	21,029,612
EOQ TOTAL	24,044	17,850	37,141	82,525	71,371	38,820	56,100,837
YTD TOTAL	24,044	17,850	37,141	82,525	71,371	38,820	56,100,837

	MU 2 BLEED GALS SAMPLED	MU 3 BLEED GALS SAMPLED	MU 4 BLEED GALS SAMPLED	MU 5 BLEED GALS SAMPLED	MU 6 BLEED GALS SAMPLED	MU 7 BLEED TO WASTE	MU 8 BLEED TO WASTE
Prev. YTD	0	0	0	0	0	0	0
January	24,044	0	37,141	0	0	0	3,952,800
February	0	17,850	0	82,525	71,371	0	3,664,800
March	0	0	0	0	0	3,109	4,226,171
EOQ TOTAL	24,044	17,850	37,141	82,525	71,371	3,109	11,843,771
YTD TOTAL	24,044	17,850	37,141	82,525	71,371	3,109	11,843,771

	TOTAL BRINE GALS PRODUCED	TOTAL PERM GALS PRODUCED	COMM BLEED TO REST FEED
Prev. YTD	0	0	0
January	3,952,800	12,042,720	1,539,010
February	3,664,800	11,390,400	1,340,064
March	4,229,280	13,574,880	1,622,896
EOQ TOTAL	11,846,880	37,008,000	4,501,970
YTD TOTAL	11,846,880	37,008,000	4,501,970

## Second Quarter 2025

WASTE VOLUME							
TOTALIZER	PLANT TO PONDS	PLANT TO DDW 1 & 2	RESTORATION TO DDW	CLEAN WATER INTO PLANT	DDW TOTAL INJECTED	TRUCKS TO POND	POND WATER TREATMENT
April	427,990	2,413,598	5,415,840	15,000	7,829,438		
May	9,250	2,483,375	6,181,920	15,000	8,665,295		
June	106,640	2,625,792	5,866,560	15,000	8,492,352		
<b>TOTAL GAL. EOQ</b>	543,880	7,522,765	17,464,320	45,000	24,987,085	0	0

DISCHARGED TO WASTE PONDS LESS POND WATER TREATMENT GALLONS =	543,880	GALLONS
DISCHARGED TO DEEP WELL=	24,987,085	GALLONS
DISCHARGED TO WASTE PONDS + DPWELL =	25,530,965	GALLONS
WF BLEED FROM WELLFIELDS=	25,485,965	GALLONS

COMMERCIAL WELLFIELD BLEED				RESTORATION WELLFIELD BLEED	
MONTH	April	May	June	MONTH	BLEED
BLEED	100.0%	100.0%	100.0%	April	20.8%
				May	23.2%
				June	23.6%

PLANT FLOW	
AVERAGE OPERATING FLOW RATE=	91 GPM EOQ
TOTAL GALLONS PRODUCED=	11,903,380 GALLONS EOQ
TOTAL GALLONS INJECTED=	0 GALLONS EOQ

	TOTAL GALS. PRODUCED	TOTAL GALS. INJECTED	HOURS IN MONTH	HOURS IN PRODUCTION	AVERAGE PROD. GPM	AVERAGE COM INJ GPM	AVERAGE REST INJ GPM	HRS. DOWN TIME
Prev. YTD	11,345,143	0	2,160	2,160	88	0	345	0
April	3,728,543	0	720	720	86	0	517	0
May	4,156,416	0	744	744	93	0	529	0
June	4,018,421	0	720	720	93	0	492	0
<b>EOQ TOTAL</b>	11,903,380	0	2,184	2,184	91	0	513	0
<b>YTD TOTAL</b>	23,248,523	0	4,344	4,344	89	0	430	0

	TOTAL MU 2 GALS SAMPLED	TOTAL MU 3 GALS SAMPLED	TOTAL MU 4 GALS SAMPLED	TOTAL MU 5 GALS SAMPLED	TOTAL MU 6 GALS SAMPLED	TOTAL MU 7 GALS PRODUCED	TOTAL MU 8 GALS PRODUCED
Prev. YTD	24,044	17,850	37,141	82,525	71,371	38,820	56,100,837
April	21,539	0	39,013	95,676	0	5,132,547	20,848,697
May	0	19,355	0	904,519	0	6,328,135	20,289,871
June	0	0	0	244,471	55,722	5,929,085	18,922,075
EOQ TOTAL	21,539	19,355	39,013	1,244,666	55,722	17,389,767	60,060,643
YTD TOTAL	45,583	37,205	76,154	1,327,191	127,093	17,428,587	116,161,480

	MU 2 BLEED GALS SAMPLED	MU 3 BLEED GALS SAMPLED	MU 4 BLEED GALS SAMPLED	MU 5 BLEED GALS SAMPLED	MU 6 BLEED GALS SAMPLED	MU 7 BLEED TO WASTE	MU 8 BLEED TO WASTE
Prev. YTD	24,044	17,850	37,141	82,525	71,371	3,109	11,843,771
April	21,539	0	39,013	95,676	0	920,308	4,495,532
May	0	19,355	0	904,519	0	1,231,391	4,950,529
June	0	0	0	244,471	55,722	1,263,592	4,602,968
EOQ TOTAL	21,539	19,355	39,013	1,244,666	55,722	3,415,290	14,049,030
YTD TOTAL	45,583	37,205	76,154	1,327,191	127,093	3,418,400	25,892,800

	TOTAL BRINE GALS PRODUCED	TOTAL PERM GALS PRODUCED	COMM BLEED TO REST FEED
Prev. YTD	11,846,880	37,008,000	4,501,970
April	5,415,840	17,853,120	1,446,929
May	6,181,920	19,291,680	1,435,705
June	5,866,560	18,110,880	1,448,078
EOQ TOTAL	17,464,320	55,255,680	4,330,712
YTD TOTAL	29,311,200	92,263,680	8,832,682

**Appendix C**

**Wellfield Injection Pressures**

**First and Second Quarter, 2025**

# First Quarter 2025

## WELLFIELD INJECTION PRESSURE - PSI

Wellhouse	AVERAGE			MAXIMUM		
	January	February	March	January	February	March
3	1	3	4	8	13	8
4	21	45	63	30	64	67
5	20	45	62	31	64	66
6	2	1	1	11	10	12
7	0	0	0	0	0	0
8	0	0	1	4	0	4
9	19	0	0	46	0	0
10	10	11	10	19	16	14
11	6	6	6	8	7	8
12	22	1	2	42	5	6
13	0	0	0	0	0	0
14	8	10	10	10	11	11
15	0	0	0	0	0	2
16	0	0	0	2	6	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	2	2	3	5	5	6
22	0	8	75	0	77	78
23	31	57	71	45	74	76
24	44	72	87	77	88	92
25	0	21	90	0	92	92
26	40	67	83	58	84	86
27	5	1	3	24	17	10
28	25	31	27	43	42	32
29	27	32	28	46	42	31
30	22	24	20	54	34	24
31	2	1	0	34	11	4
32	8	10	5	14	20	10
33	10	12	8	16	24	12
34	49	75	89	70	93	95
35	49	77	90	70	92	94
36	2	7	49	6	74	62
37	46	76	92	64	93	96
38	44	72	86	64	88	95
39	36	62	78	50	80	82
40	44	71	86	58	88	90
41	0	0	0	3	0	3

<b>42</b>	0	0	0	0	0	0
<b>43</b>	0	0	0	0	0	0
<b>44</b>	0	0	0	0	0	0
<b>45</b>	0	0	0	0	0	0
<b>46</b>	32	35	14	69	91	93
<b>46A</b>	27	29	28	44	31	40
<b>47</b>	0	0	0	0	0	2
<b>47A</b>	0	0	0	0	0	0
<b>48</b>	39	45	54	58	76	82
<b>49</b>	3	5	6	6	6	8
<b>50</b>	1	3	16	5	64	42
<b>51</b>	3	19	34	50	83	53
<b>52</b>	43	50	60	85	70	85
<b>53</b>	3	0	0	88	0	0
<b>54</b>	34	62	76	64	78	80
<b>55</b>	43	70	85	66	87	88
<b>56</b>	2	0	0	63	0	0
<b>57</b>	2	0	0	74	0	0
<b>60</b>	1	0	1	15	0	5
<b>61</b>	0	0	0	4	0	4
<b>62</b>	0	0	0	0	0	0
<b>63</b>	0	0	0	0	0	0
<b>64</b>	0	0	0	0	0	0

## Second Quarter 2025

### WELLFIELD INJECTION PRESSURE - PSI

Wellhouse	AVERAGE			MAXIMUM		
	April	May	June	April	May	June
3	2	1	11	6	6	60
4	42	52	41	72	84	72
5	43	50	40	74	78	55
6	3	2	7	11	12	38
7	0	0	2	0	0	18
8	0	0	4	5	0	31
9	2	0	8	36	0	82
10	6	6	14	16	16	70
11	6	6	12	16	8	70
12	1	0	0	5	5	5
13	0	0	8	0	0	80
14	9	9	17	12	11	86
15	0	0	8	0	0	80
16	0	2	10	0	66	98
17	0	0	7	0	0	75
18	0	0	9	0	0	88
19	0	0	9	0	0	95
20	0	0	8	0	0	82
21	1	1	11	5	6	95
22	53	60	59	92	96	90
23	51	58	55	83	92	99
24	57	67	69	97	99	92
25	46	68	69	97	99	77
26	58	64	62	96	99	70
27	1	4	0	8	95	0
28	30	40	40	42	59	67
29	34	43	39	46	75	44
30	26	35	35	38	53	67
31	4	10	5	12	25	12
32	13	20	16	25	35	21
33	14	22	19	24	37	24
34	64	70	75	99	99	82
35	63	70	79	95	96	85
36	37	34	35	46	37	37
37	64	70	73	99	99	79
38	60	67	68	94	96	75
39	54	61	60	85	98	66
40	23	5	56	95	88	71
41	0	0	1	4	4	4
42	0	0	2	9	0	54

<b>43</b>	0	0	1	0	0	15
<b>44</b>	0	0	1	0	0	33
<b>45</b>	0	1	1	0	32	38
<b>46</b>	15	2	6	99	9	60
<b>46A</b>	21	26	35	28	35	63
<b>47</b>	0	0	0	0	0	0
<b>47A</b>	0	0	0	0	0	0
<b>48</b>	58	49	50	82	62	53
<b>49</b>	5	1	1	38	5	5
<b>50</b>	3	0	1	12	4	4
<b>51</b>	38	38	37	63	80	55
<b>52</b>	81	47	46	84	80	48
<b>53</b>	0	0	0	0	0	0
<b>54</b>	54	61	57	84	98	66
<b>55</b>	62	65	67	95	99	73
<b>56</b>	0	2	1	0	60	20
<b>57</b>	0	2	0	0	56	0
<b>60</b>	0	2	0	4	65	0
<b>61</b>	0	1	0	0	45	0
<b>62</b>	0	0	0	0	0	0
<b>63</b>	0	0	0	0	0	0
<b>64</b>	0	0	0	0	0	0

## **Appendix D**

### **Deep Disposal Wells Injection Radiological Data**

**First and Second Quarter, 2025**

**Crow Butte Uranium Mine  
Deep Disposal Well #1 Injection Radiological Data**

Month	Total Gallons Injected	Average Natural Uranium (mg/l)	Total Natural Uranium Injected (mg)	Total Natural Uranium Injected (uCi)	Average Radium-226 (pCi/l)	Total Radium-226 Injected (uCi)
January-25	8,260,145	0.755	2.36E+07	1.60E+04	312	9.76E+03
February-25	7,318,818	0.070	1.94E+06	1.32E+03	348	9.64E+03
March-25	7,018,177	0.159	4.22E+06	2.86E+03	401	1.07E+04
April-25	7,140,907	0.090	2.42E+06	1.64E+03	419	1.13E+04
May-25	7,848,825	0.120	3.57E+06	2.41E+03	414	1.23E+04
June-25	7,754,904	0.116	3.41E+06	2.31E+03	410	1.20E+04
Totals	45,341,776		3.92E+07	2.65E+04		6.57E+04

**Crow Butte Uranium Mine  
Deep Disposal Well #2 Injection Radiological Data**

Month	Total Gallons Injected	Average Natural Uranium (mg/l)	Total Natural Uranium Injected (mg)	Total Natural Uranium Injected (uCi)	Average Radium-226 (pCi/l)	Total Radium-226 Injected (uCi)
January-25	796,629	0.755	2.28E+06	1.54E+03	312	9.41E+02
February-25	740,828	0.070	1.97E+05	1.33E+02	348	9.76E+02
March-25	792,261	0.159	4.77E+05	3.23E+02	401	1.20E+03
April-25	688,531	0.090	2.33E+05	1.58E+02	419	1.09E+03
May-25	816,470	0.120	3.71E+05	2.51E+02	414	1.28E+03
June-25	737,448	0.116	3.24E+05	2.19E+02	410	1.14E+03
Totals	4,572,167		3.88E+06	2.63E+03		6.64E+03

**Appendix E**

**Radon Release Calculations**

**First and Second Quarter, 2025**

## Radon Effluent Release Calculation (Production and Startup)

### First Quarter 2025 Radon Release from Leaching Operations:

<i>Curies/M<sup>3</sup></i>	<i>Production Flow (liters)</i>	<i>Radon-222 Decay Constant</i>	<i>Operating Days</i>	<i>Operating Factor</i>	<i>M<sup>3</sup>/liter conversion</i>	<i>Hours/Day Conversion</i>	<i>Minutes/Hour Conversion</i>	<i>Total Radon Release from Leaching</i>
7.04E-04	333	0.72	90	100.0%	0.001	24	60	22

### Second Quarter 2025 Radon Release from Leaching Operations:

<i>Curies/M<sup>3</sup></i>	<i>Production Flow (liters)</i>	<i>Radon-222 Decay Constant</i>	<i>Operating Days</i>	<i>Operating Factor</i>	<i>M<sup>3</sup>/liter conversion</i>	<i>Hours/Day Conversion</i>	<i>Minutes/Hour Conversion</i>	<i>Total Radon Release from Leaching</i>
7.04E-04	344	0.72	91	100.0%	0.001	24	60	23

### First Half 2025 Radon Release From Startup:

<i>Curies/M<sup>3</sup></i>	<i>Total Acres of New Wellfield</i>	<i>Meter<sup>2</sup>/Acre Conversion</i>	<i>Orebody Thickness (meters)</i>	<i>Porosity</i>	<i>Total Radon Release from Startup</i>
7.04E-04	0.0	4,074	1.52	0.29	0

**Total Estimated Radon Release from Production:**

**45**

## Radon Effluent Release Calculation (Restoration)

### First Half 2025 Radon Release From Restoration:

<i>Total Restoration Flow (liters)</i>	<i>Microcuries/liter</i>	<i>Curies/Microcurie</i>	<i>Production Potential</i>
460,210,767	0.697	1.00E-06	321

Wellfield Loss (25% of Production Potential):

80

Ion Exchange Loss (10% of Production Potential minus Wellfield Loss):

24

Reverse Osmosis Loss (100% of remaining activity at 0.470 microcuries/liter)

24

<i>Total Reverse Osmosis Flow (liters)</i>	<i>Microcuries/liter</i>	<i>Curies/Microcurie</i>
51,589,131	0.470	1.00E-06

### First Half 2025 Radon Release From Startup of New Restoration:

<i>Curies/M<sup>3</sup></i>	<i>Total Acres of New Wellfield</i>	<i>Meter<sup>2</sup>/Acre Conversion</i>	<i>Orebody Thickness (meters)</i>	<i>Porosity</i>	<i>Total Radon Release from Startup</i>
7.04E-04	0.00	4074	1.52	0.29	0

**Total Estimated Radon Release from Restoration:**

**128**

**Total Estimated Radon Release, First Half 2025:**

**173**

**Appendix F**

**Main Plant**

**Track Etch Detectors**

**Working Level Measurements**

**Scintillation Cell Measurements**

**Isotopic Analyses**

**First Half, 2025**

# Calculation of Radon Gas Emissions from the Main Plant

## First Half of Year

Locations	RnG Concentration (x 10 <sup>-9</sup> μCi/ml)
01 Blower Pipe (Injection Filters)	3.8
02 Blower Pipe (Between Injection Tanks)	2.5
03 Boxed Fan (PWT West)	2.2
04 Boxed Fan (PWT East)	1.6
05 Pipe Duct (PWT)	2
09 Boxed Fan (Behind Acid Scrubber)	0.95
12 Shaker Room Blower/Exhaust	10.1

	Average RnG Concentration (μCi/ml)	Plant Vent Rate (CFM)	Plant Vent Rate (ml/6 months)	RnG Emissions (Ci/6 Months)
<b>Plant Average</b>	<b>3.3E-09</b>	<b>49748</b>	<b>3.7E+14</b>	<b>1.22</b>

Formula Ci/yr = average (μCi/ml) \* ventilation (ml/yr) / (1e6 μCi/Ci)

# Calculation of Radon Progeny Emissions from the Plant First Half 2025

Exhaust Rate for Building (CFM) 49748  
 Total Flow from Building (ml/ 6 months) 3.7E+14

**Total In Plant Radon Progeny Emissions (Ci/yr) 0.26**

Formula Ci/yr = WL \* (3e-8 μCi/ml/0.33 WL) \* ventilation (ml/6 months) / (1e6 μCi/Ci)

Start Date 1/1/2025 Average 0.0078  
 End Date 6/30/2025

SITE_CODE	LOCATION_NAME	START_DATE	RNP_VALUE	AREA_SAMPLE_CLASS_CODE
CB	R6 Between IX Column Trains	6/19/2025 7:44	0.00848602	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	6/19/2025 7:38	0.00558325	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	6/19/2025 7:32	0.02724458	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	6/19/2025 7:26	0.00741533	Dosimetry
CB	R13-E Pond Water Treatment Room East	6/19/2025 7:20	0.00668119	Dosimetry
CB	R13-M Pond Water Treatment Room Middle	6/19/2025 7:14	0.00492118	Dosimetry
CB	R13-W Pond Water Treatment Room West	6/19/2025 7:06	0.00367126	Dosimetry
CB	R12 Down Flow Column Area	6/19/2025 7:00	0.00174292	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	6/19/2025 6:54	0.00576966	Dosimetry
CB	R1 Between IX Columns and Precip Cells	6/19/2025 6:48	0.00672269	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	6/19/2025 6:42	0.00726925	Dosimetry
CB	R8 Motor Control Room	6/19/2025 6:36	0.00154926	Dosimetry
CB	R6 Between IX Column Trains	5/14/2025 8:24	0.00852788	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	5/14/2025 8:18	0.01572327	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	5/14/2025 8:12	0.02172670	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	5/14/2025 8:06	0.01067996	Dosimetry
CB	R13-E Pond Water Treatment Room East	5/14/2025 8:00	0.01818967	Dosimetry
CB	R13-M Pond Water Treatment Room Middle	5/14/2025 7:54	0.01717913	Dosimetry
CB	R13-W Pond Water Treatment Room West	5/14/2025 7:48	0.00755926	Dosimetry
CB	R12 Down Flow Column Area	5/14/2025 7:41	0.00294811	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	5/14/2025 7:35	0.00615258	Dosimetry
CB	R1 Between IX Columns and Precip Cells	5/14/2025 7:29	0.00918663	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	5/14/2025 7:23	0.00739919	Dosimetry
CB	R8 Motor Control Room	5/14/2025 7:17	0.00486673	Dosimetry
CB	R6 Between IX Column Trains	4/23/2025 8:35	0.00699246	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	4/23/2025 8:29	0.00473934	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	4/23/2025 8:23	0.00626464	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	4/23/2025 8:17	0.00818100	Dosimetry
CB	R13-E Pond Water Treatment Room East	4/23/2025 8:11	0.00555848	Dosimetry

CB	R13-M Pond Water Treatment Room Middle	4/23/2025 8:05	0.00759509	Dosimetry
CB	R13-W Pond Water Treatment Room West	4/23/2025 7:59	0.00916272	Dosimetry
CB	R12 Down Flow Column Area	4/23/2025 7:52	0.00436960	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	4/23/2025 7:46	0.00737230	Dosimetry
CB	R1 Between IX Columns and Precip Cells	4/23/2025 7:40	0.00472118	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	4/23/2025 7:34	0.00617385	Dosimetry
CB	R8 Motor Control Room	4/23/2025 7:27	0.00304536	Dosimetry
CB	R6 Between IX Column Trains	3/19/2025 9:00	0.01099121	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	3/19/2025 8:54	0.01108790	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	3/19/2025 8:48	0.01545430	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	3/19/2025 8:42	0.00882053	Dosimetry
CB	R13-E Pond Water Treatment Room East	3/19/2025 8:36	0.00885006	Dosimetry
CB	R13-M Pond Water Treatment Room Middle	3/19/2025 8:30	0.00651331	Dosimetry
CB	R13-W Pond Water Treatment Room West	3/19/2025 8:24	0.00768616	Dosimetry
CB	R12 Down Flow Column Area	3/19/2025 8:18	0.00831335	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	3/19/2025 8:12	0.00732747	Dosimetry
CB	R1 Between IX Columns and Precip Cells	3/19/2025 8:06	0.00764606	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	3/19/2025 8:00	0.00323337	Dosimetry
CB	R8 Motor Control Room	3/19/2025 7:53	0.00000000	Dosimetry
CB	R6 Between IX Column Trains	2/12/2025 9:08	0.00467470	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	2/12/2025 9:02	0.00427204	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	2/12/2025 8:56	0.00341763	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	2/12/2025 8:50	0.00256323	Dosimetry
CB	R13-E Pond Water Treatment Room East	2/12/2025 8:44	0.00561167	Dosimetry
CB	R13-M Pond Water Treatment Room Middle	2/12/2025 8:38	0.00481478	Dosimetry
CB	R13-W Pond Water Treatment Room West	2/12/2025 8:32	0.00500360	Dosimetry
CB	R12 Down Flow Column Area	2/12/2025 8:26	0.00350877	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	2/12/2025 8:20	0.00498405	Dosimetry
CB	R1 Between IX Columns and Precip Cells	2/12/2025 8:14	0.00762777	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	2/12/2025 8:06	0.00863120	Dosimetry
CB	R8 Motor Control Room	2/12/2025 8:00	0.00307450	Dosimetry
CB	R6 Between IX Column Trains	1/22/2025 8:43	0.01401417	Dosimetry
CB	R5 Between IX Columns and Column Drain Tank	1/22/2025 8:37	0.01869405	Dosimetry
CB	R4 Between IX Columns and Resin Transfer Tanks	1/22/2025 8:31	0.02070055	Dosimetry
CB	R3 Between IX Columns and Injection Tanks	1/22/2025 8:25	0.01035028	Dosimetry
CB	R13-E Pond Water Treatment Room East	1/22/2025 8:19	0.00987362	Dosimetry
CB	R13-M Pond Water Treatment Room Middle	1/22/2025 8:13	0.00468083	Dosimetry
CB	R13-W Pond Water Treatment Room West	1/22/2025 8:07	0.01124073	Dosimetry
CB	R12 Down Flow Column Area	1/22/2025 8:00	0.00386885	Dosimetry
CB	R2 Between Precip Cells and Eluent Tanks	1/22/2025 7:54	0.00773083	Dosimetry
CB	R1 Between IX Columns and Precip Cells	1/22/2025 7:48	0.00596805	Dosimetry
CB	R7 Between Precip Cells and Raw Water Tank	1/22/2025 7:42	0.00798969	Dosimetry
CB	R8 Motor Control Room	1/22/2025 7:35	0.00418737	Dosimetry

# Tank Vent Effluent (RnP and RnG Emissions from Tank Vents)

## First Half Data

Location	Ventilation Blower Flow Rates (cfm)	Ventilation Blower Flow Rates (m <sup>3</sup> /min)	Ventilation Blower Flow Rates (L/min)	First Quarter Results						Second Quarter Results					
				RnG Filling pCi/l	RnP Filling WL	RnG Draining pCi/l	RnP Draining WL	RnG Steady pCi/l	RnP Steady WL	RnG Filling pCi/l	RnP Filling WL	RnG Draining pCi/l	RnP Draining WL	RnG Steady pCi/l	RnP Steady WL
6 - Pond Water Treat. Fan	4700	133.1	133089.0					42.99	0.029					26.64	0.135
8 - Waste Tank Blower	1500	42.5	42475.2					111.08	0.002					225.87	0.052
10 - Precip Demister Fan	1500	42.5	42475.2					1.37	0.003					1.53	0.005
11 - Shaker Deck Blower	800	22.7	22653.4					0.27	0.001					9.7	0.005
13 - Eluent Tank Blower	1500	42.5	42475.2					3.12	0.007					1621.19	0.052
14 - Precip A Blower	185	5.2	5238.6					0.2	0.014					2.41	0.028
15 - East Train/West Train/Backwash Tank Blower	6000	169.9	169900.8					7932.79	16.149					8845.52	12.532

Footnote: Locations numbered per HPC Air Ventilation Study - August 2013 (LRA SUA 1534 November 2014 Appendix C) ML15310A373

**First Half Results**

Location	Ventilation Blower Flow Rates (cfm)	Ventilation Blower Flow Rates (m <sup>3</sup> /min)	Ventilation Blower Flow Rates (L/min)	RnG Steady pCi/l	RnP Steady WL	Average RnG (pCi/l)	Average RnG (pCi/min)	Average RnG Emissions (Ci/6months)	Average RnP Emissions (Ci/6 months)	Max RnG (pCi/l)	Max RnG (pCi/min)	Maximum RnG Emissions (Ci/6 months)	Maximum RnP Emissions (Ci/6 months)
6 - Pond Water Treat. Fan	4700	133.1	133089.0	34.8	0.1	34.8	4.63E+06	1.22	0.3	34.8	4.63E+06	1.22	0.26
8 - Waste Tank Blower	1500	42.5	42475.2	168.5	0.0	168.5	7.16E+06	1.88	0.0	168.5	7.16E+06	1.88	0.03
10 - Precip Demister Fan	1500	42.5	42475.2	1.5	0.0	1.5	6.16E+04	0.02	0.0	1.5	6.16E+04	0.02	0.00
11 - Shaker Deck Blower	800	22.7	22653.4	5.0	0.0	5.0	1.13E+05	0.03	0.0	5.0	1.13E+05	0.03	0.00
13 - Eluent Tank Blower	1500	42.5	42475.2	812.2	0.0	812.2	3.45E+07	9.1	0.0	812.2	3.45E+07	9.07	0.03
14 - Precip A Blower	185	5.2	5238.6	1.3	0.0	1.3	6.84E+03	0.0	0.0	1.3	6.84E+03	0.00	0.00
15 - East Train/West Train/Backwash Tank Blower	6000	169.9	169900.8	8389.2	14.3	8389.2	1.43E+09	374.6	58.2	8389.2	1.43E+09	374.58	58.21

Footnote: Locations numbered per HPC Air Ventilation Study - August 2013 (LRA SUA 1534 November 2014 Appendix C) ML15310A373

<b>Sum</b>	<b>386.8</b>	<b>58.5</b>
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**First Half 2025 Tank RnP and RnG**

<b>386.79</b>	<b>58.54</b>
<b>445.32</b>	

# Calculation of Particulate Emissions from the Plant

2025

	Total Volume (L)	Lab Result ( $\mu\text{Ci/ml}$ )				Calculated Result ( $\mu\text{Ci/ml}$ )	
		Lead 210	Radium 226	Thorium 230	Uranium	Th234	Po-210
Between IX Train	568584.0	1.50E-14	2.70E-15	1.20E-16	5.40E-15	2.65E-15	1.50E-14
Below Thickener Tank	569745.0	4.00E-14	6.00E-15	5.40E-16	6.60E-14	3.23E-14	4.00E-14
Top of Precip B	568828.0	1.40E-14	3.60E-15	1.20E-15	1.20E-14	5.88E-15	1.40E-14
Belt Filter Room	557991.0	1.30E-14	2.80E-15	4.30E-16	3.10E-14	1.52E-14	1.30E-14
Top of Tall White Tanks	568424.0	1.70E-14	4.90E-15	1.60E-16	1.30E-13	6.37E-14	1.70E-14
Dryer Change Room	525463.0	2.10E-14	5.40E-15	7.70E-16	1.20E-14	5.88E-15	2.10E-14
R.O. Building	567377.0	1.30E-14	3.00E-15	3.70E-16	6.20E-16	3.04E-16	1.30E-14
<b>10 CFR 20 Effluent Limit</b>		<b>1.00E-10</b>	<b>3.00E-10</b>	<b>6.00E-12</b>	<b>2.00E-11</b>	<b>3.00E-10</b>	<b>9.00E-13</b>
<b>RL</b>		<b>2.00E-15</b>	<b>1.00E-16</b>	<b>1.00E-16</b>	<b>1.00E-16</b>		

Note: if result was non-detect, 1/2 RL was used

Exhaust Rate for Building (CFM)	49748
Total Flow from Building (ml/ 6 months)	3.70E+14

## Total Emissions of Each Radionuclide for First Half of 2025

	Emission (Ci/yr)
Lead 210	7.03E-06
Radium 226	1.50E-06
Thorium 230	1.90E-07
Uranium	1.36E-05
Th234	6.66E-06
Po-210	7.03E-06
<b>Sum</b>	<b>3.60E-05</b>

## **Appendix G**

### **Wellfield**

**Scintillation Cell Measurements**

**Spill Radon Calculation**

**First and Second Quarter, 2025**

# Calculation of Radon Gas Emissions from Venting Wellheads

## First Half of Year

	RnG (pCi/L)
Average RnG vented from Wellheads - Q1	N/A
Average RnG vented from Wellheads - Q2	N/A

### Total Emissions for First Half

Average RnG (pCi/L)	0	
Casing volume (L)	1563.75	(4.5 in diameter, 500 ft depth)
Wellheads bled/Month	0	
Wellheads bled/6 Months	0	
Ci/6 Months	<b>0.00E+00</b>	

### SPILL CALCULATION

Quarter	Volume in Liters	Ci Radon per cubic meter	Total Curies
Q1-Q2	927.4255	7.04E-04	6.53E-04

# **Appendix H**

## **Wellhouses**

**Track Etch Detectors**

**Working Level Measurements**

**Isotopic Analyses**

**First and Second Quarter, 2025**

# Calculation of Radon Gas Emissions from Wellhouses

## First Half of Year

Wellhouses	RnG Concentration (x 10 <sup>-9</sup> μCi/ml)
Wellhouse 10	13.2
Wellhouse 13	0.84
Wellhouse 19	3.1
Wellhouse 25	4
Wellhouse 30	2.7
Wellhouse 34	4.8
Wellhouse 57	0.89
Wellhouse 63	0.86
Wellhouse 9 *	28.3

## Total Emissions for First Half of Year

	Average RnG Concentration (μCi/ml)	WH Vent Rate (CFM)	WH Vent Rate (ml/6 months)	# WH	RnG Emissions (Ci/6 Months)
WH Avg Concentration (Restoration)	5.29E-09	800	6.0E+12	24	0.76
WH Avg Concentration (Production)	2.31E-09	800	6.0E+12	39	0.54
*WH Not part of Average	2.83E-08	800	6.0E+12	1	0.17
Total Radon Gas Emissions from WH's					<b>1.46</b>

$$\text{Formula Ci/yr} = \text{average } (\mu\text{Ci/ml}) * \text{ventilation (ml/yr)} * \# \text{ WH} / (1\text{e}6 \mu\text{Ci/Ci})$$

# Calculation of Particulate Emissions from the Wellhouses

## First Half of Year

	Total Volume (L)	Lab Result (μCi/ml)				Calculated Result (μCi/ml)	
		Lead 210	Radium 226	Thorium 230	Uranium	Th234	Po-210
Wellhouse 10	499313.0	2.80E-15	1.20E-15	2.70E-16	4.10E-16	2.01E-16	2.80E-15
Wellhouse 13	499157.0	1.00E-15	5.60E-16	1.80E-16	4.20E-16	2.06E-16	1.00E-15
Wellhouse 19	499367.0	8.50E-14	5.10E-16	3.30E-16	3.50E-16	1.72E-16	8.50E-14
Wellhouse 25	510390.0	4.00E-15	5.00E-17	1.40E-16	7.90E-16	3.87E-16	4.00E-15
Wellhouse 30	492898.0	1.10E-14	3.70E-16	4.00E-16	2.40E-16	1.18E-16	1.10E-14
Wellhouse 34	510036.0	1.90E-14	5.00E-17	3.00E-14	5.20E-16	2.55E-16	1.90E-14
Wellhouse 57	509402.0	1.10E-14	2.40E-16	1.60E-14	2.20E-16	1.08E-16	1.10E-14
Wellhouse 63	498877.0	1.70E-14	3.90E-16	3.40E-16	1.00E-15	4.90E-16	1.70E-14
<b>10 CFR 20 Effluent Limit</b>		<b>1.00E-10</b>	<b>3.00E-10</b>	<b>6.00E-12</b>	<b>2.00E-11</b>	<b>3.00E-10</b>	<b>9.00E-13</b>
<b>RL</b>		<b>2.00E-15</b>	<b>1.00E-16</b>	<b>1.00E-16</b>	<b>1.00E-16</b>		

Note: if result was non-detect, 1/2 RL was used

Exhaust Rate for Wellhouse (CFM)	800	
Total Flow from Building (ml/ 6 months)	6.0E+12	(1 ft3 = 28316.84659 ml)
# Wellhouses	64	

### Total Emissions of Each Radionuclide for First Half of Year

	Emission (Ci/6 Months)
Lead 210	7.18E-06
Radium 226	1.61E-07
Thorium 230	2.27E-06
Uranium	1.88E-07
Th234	9.22E-08
Po-210	7.18E-06
<b>Sum</b>	<b>1.71E-05</b>

# Calculation of Particulate Emissions from DeepWell Buildings

## First Half of Year

	Total Volume (L)	Lab Result (μCi/ml)				Calculated Result (μCi/ml)	
		Lead 210	Radium 226	Thorium 230	Uranium	Th234	Po-210
DeepWell Building #1	511082.0	4.80E-14	2.80E-16	1.70E-15	4.70E-16	2.30E-16	4.80E-14
DeepWell Building #2	509094.0	1.00E-15	4.30E-16	6.90E-15	2.80E-16	1.37E-16	1.00E-15
<b>10 CFR 20 Effluent Limit RL</b>		<b>1.00E-10</b>	<b>3.00E-10</b>	<b>6.00E-12</b>	<b>2.00E-11</b>	<b>3.00E-10</b>	<b>9.00E-13</b>
		<b>2.00E-15</b>	<b>1.00E-16</b>	<b>1.00E-16</b>	<b>1.00E-16</b>		

Note: if result was non-detect, 1/2 RL was used

	Building 1	Building 2	
Exhaust Rate for Wellhouse (CFM)	800	800	
Total Flow from Building (ml/ 6 months)	6.0E+12	6.0E+12	(1 ft3 = 28316.84659 ml)

### Total Emissions of Each Radionuclide for First Half of Year

	Emission (Ci/6 Months)	
	<u>Building 1</u>	<u>Building 2</u>
Lead 210	2.86E-07	5.95E-09
Radium 226	1.67E-09	2.56E-09
Thorium 230	1.01E-08	4.11E-08
Uranium	2.80E-09	1.67E-09
Th234	1.37E-09	8.17E-10
Po-210	2.86E-07	5.95E-09
<b>By Building</b>	<b>5.87E-07</b>	<b>5.80E-08</b>
<b>Total</b>	<b>6.46E-07</b>	

# Crow Butte Resources

## Wellhouse Radon Daughters Summary

WH#	2025 2nd Qtr. Working Level Concentration	Date	2025 1st Qtr. Working Level Concentration	Date
3	0.002	4/23/2025	0.003	1/15/2025
4	0.002	4/23/2025	0.003	1/15/2025
5	0.002	4/23/2025	0.002	1/15/2025
6	0.004	4/23/2025	0.003	1/15/2025
7	0.002	4/23/2025	0.003	1/15/2025
8	0.003	4/23/2025	0.000	1/15/2025
9	0.031	4/24/2025	0.011	1/15/2025
10	0.031	4/24/2025	0.008	1/15/2025
11	0.001	4/24/2025	0.003	1/15/2025
12	0.002	4/24/2025	0.002	1/15/2025
13	0.001	4/24/2025	0.004	1/15/2025
14	0.005	4/24/2025	0.003	1/15/2025
15	0.002	4/24/2025	0.001	1/15/2025
16	0.004	4/24/2025	0.003	1/15/2025
17	0.002	4/24/2025	0.004	1/16/2025
18	0.001	4/24/2025	0.002	1/15/2025
19	0.004	4/24/2025	0.002	1/15/2025
20	0.003	4/24/2025	0.009	1/16/2025
21	0.003	4/24/2025	0.002	1/16/2025
22	0.005	4/24/2025	0.004	1/16/2025
23	0.001	4/24/2025	0.004	1/16/2025
24	0.005	4/24/2025	0.024	1/16/2025
25	0.002	4/24/2025	0.013	1/16/2025
26	0.001	4/24/2025	0.022	1/16/2025
27	0.004	4/24/2025	0.003	1/16/2025
28	0.003	5/23/2025	0.009	2/20/2025
29	0.002	5/23/2025	0.004	2/20/2025
30	0.004	5/23/2025	0.005	2/20/2025
31	0.000	5/22/2025	0.002	2/20/2025
32	0.002	5/22/2025	0.003	2/20/2025
33	0.001	5/22/2025	0.004	2/20/2025
34	0.003	5/22/2025	0.010	2/20/2025
35	0.001	5/22/2025	0.006	2/20/2025
36	0.009	5/22/2025	0.019	2/20/2025
37	0.005	5/22/2025	0.002	2/20/2025

# Crow Butte Resources

## Wellhouse Radon Daughters Summary

WH#	2025 2nd Qtr. Working Level Concentration	Date	2025 1st Qtr. Working Level Concentration	Date
38	0.008	5/22/2025	0.005	2/20/2025
39	0.004	5/22/2025	0.014	2/20/2025
40	0.003	5/22/2025	0.005	2/20/2025
41	0.002	5/23/2025	0.004	2/20/2025
42	0.004	5/23/2025	0.012	2/21/2025
43	0.004	5/23/2025	0.004	2/21/2025
44	0.001	5/22/2025	0.007	2/21/2025
45	0.004	5/23/2025	0.004	2/21/2025
46	0.003	5/22/2025	0.005	2/20/2025
46A	0.007	5/22/2025	0.005	2/20/2025
47	0.002	5/23/2025	0.002	2/21/2025
47A	0.002	5/23/2025	0.002	2/21/2025
48	0.005	5/22/2025	0.017	2/20/2025
49	0.024	5/22/2025	0.024	2/20/2025
50	0.001	5/22/2025	0.003	2/20/2025
51	0.009	6/20/2025	0.007	3/13/2025
52	0.005	6/20/2025	0.001	3/13/2025
53	0.006	6/20/2025	0.001	3/13/2025
54	0.006	6/20/2025	0.001	3/13/2025
55	0.005	6/20/2025	0.002	3/13/2025
56	0.005	6/20/2025	0.004	3/13/2025
57	0.006	6/20/2025	0.004	3/13/2025
60	0.004	6/20/2025	0.001	3/13/2025
61	0.001	6/23/2025	0.003	3/13/2025
62	0.002	6/23/2025	0.003	3/13/2025
63	0.001	6/23/2025	0.001	3/13/2025
64	0.001	6/23/2025	0.001	3/13/2025
DDW-1	0.009	6/20/2025	0.003	3/14/2025
DDW-2	0.004	6/20/2025	0.001	3/13/2025

**Appendix I**

**Environmental Air Monitoring Results**

**First and Second Quarter, 2025**

**Crow Butte Resources, Inc.**  
Crow Butte Uranium Project

**Track Etch Cup Ambient Radon Concentrations**

*Air  
Monitoring  
Station No.*

*Period: January 1, 2025 to July 1, 2025*

	Gross Count	Average Radon Concentration (x 10 <sup>-9</sup> μCi/ml)	Accuracy (x 10 <sup>-9</sup> μCi/ml)	Percent Effluent Concentration
AM-1	14.0	0.11	0.03	1.1%
AM-2	16.0	0.16	0.04	1.6%
AM-3	16.0	0.27	0.07	2.7%
AM-4	16.0	0.16	0.04	1.6%
AM-5	16.0	0.16	0.04	1.6%
AM-6A	14.0	0.16	0.04	1.6%
AM-6B	16.0	0.19	0.05	1.9%
AM-6C	14.0	0.14	0.04	1.4%
AM-6D	16.0	0.16	0.04	1.6%
AM-6E	14.0	0.11	0.03	1.1%
AM-6F	16.0	0.16	0.04	1.6%
AM-8	14.0	0.14	0.04	1.4%
AM-9A	14.0	0.08	0.02	0.8%
AM-9B	14.0	0.08	0.02	0.8%
AM-9C	14.0	0.11	0.03	1.1%
AM-9D	16.0	0.16	0.04	1.6%
AM-9E	16.0	0.16	0.04	1.6%
AM-9F	14.0	0.11	0.03	1.1%
LLD (x 10 <sup>-9</sup> μCi/ml)				0.2
Effluent Concentration Limit, 10 CFR 20 App B Column 2:				10



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-1**

**Lab ID: S2504107-001**

**Sample Air Volume: 6431222 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	70.1	6.8	1.1E-14	1.1E-15	2E-15	6 E-13	Day	1.8
Radium 226	0.10	0.1	1.6E-17	1.6E-17	1E-16	9 E-13	Week	0.0018
Thorium 230	0.13	0.1	2.2E-17	1.6E-17	1E-16	3 E-14	Year	0.073
Uranium	0.9		1.5E-16		1E-16	9 E-14	Year	0.17



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-2**

**Lab ID: S2504107-002**

**Sample Air Volume: 6430572 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	64.4	6.9	1.0E-14	1.1E-15	2E-15	6 E-13	Day	1.7
Radium 226	0.16	0.1	2.5E-17	1.6E-17	1E-16	9 E-13	Week	0.0028
Thorium 230	0.11	0.1	1.8E-17	1.6E-17	1E-16	3 E-14	Year	0.060
Uranium	0.4		5.6E-17		1E-16	9 E-14	Year	0.062



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-3**

**Lab ID: S2504107-003**

**Sample Air Volume: 6437685 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	108	7.5	1.7E-14	1.2E-15	2E-15	6 E-13	Day	2.8
Radium 226	0.0	0.2	0.0E+0	3.1E-17	1E-16	9 E-13	Week	0
Thorium 230	0.3	0.2	4.7E-17	3.1E-17	1E-16	3 E-14	Year	0.16
Uranium	0.4		5.8E-17		1E-16	9 E-14	Year	0.064



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-4**

**Lab ID: S2504107-004**

**Sample Air Volume: 6109162 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	113	11.3	1.8E-14	1.8E-15	2E-15	6 E-13	Day	3.0
Radium 226	0.2	0.2	4.0E-17	3.3E-17	1E-16	9 E-13	Week	0.0044
Thorium 230	0.22	0.2	3.8E-17	3.3E-17	1E-16	3 E-14	Year	0.13
Uranium	0.4		6.1E-17		1E-16	9 E-14	Year	0.068



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-5**

**Lab ID: S2504107-005**

**Sample Air Volume: 6182317 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	109	7.5	1.8E-14	1.2E-15	2E-15	6 E-13	Day	3.0
Radium 226	0.17	0.2	2.9E-17	3.2E-17	1E-16	9 E-13	Week	0.0032
Thorium 230	0.10	0.1	1.7E-17	1.6E-17	1E-16	3 E-14	Year	0.057
Uranium	0.7		1.1E-16		1E-16	9 E-14	Year	0.12



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-6**

**Lab ID: S2504107-006**

**Sample Air Volume: 6448897 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	453	14.8	7.0E-14	2.3E-15	2E-15	6 E-13	Day	12
Radium 226	0.2	0.2	3.3E-17	3.1E-17	1E-16	9 E-13	Week	0.0037
Thorium 230	0.08	0.1	1.3E-17	1.6E-17	1E-16	3 E-14	Year	0.043
Uranium	0.4		6.9E-17		1E-16	9 E-14	Year	0.077



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

**Client Sampler ID: AM-8**

**Lab ID: S2504107-007**

**Sample Air Volume: 6413194 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	176	8.4	2.8E-14	1.3E-15	2E-15	6 E-13	Day	4.7
Radium 226	0.2	0.2	3.4E-17	3.1E-17	1E-16	9 E-13	Week	0.0038
Thorium 230	0.04	0.1	6.8E-18	1.6E-17	1E-16	3 E-14	Year	0.023
Uranium	0.3		4.0E-17		1E-16	9 E-14	Year	0.044



### Air Filter Summary Report

**Client: Cameco Resources, Crow Butte Operation**

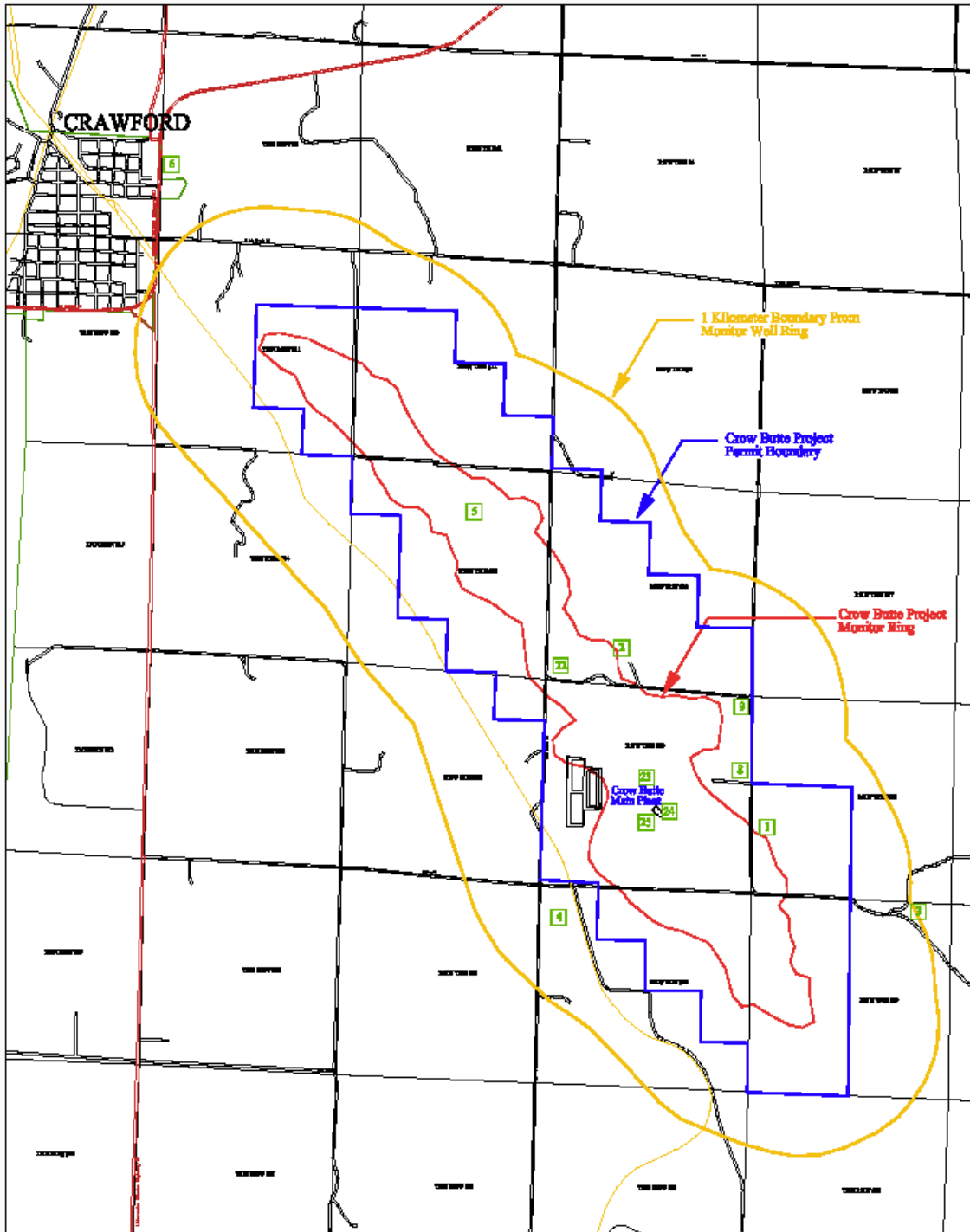
**Client Sampler ID: AM-9**

**Lab ID: S2504107-008**

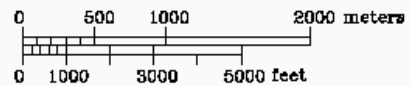
**Sample Air Volume: 5046167 Liters**

Analyte	Result pCi/filter	Precision ± pCi/filter	Result µCi/ml	Precision ± µCi/ml	RL	10 CFR Pt 20 Effluent Limit	Effluent Class	% Effluent Conc.
Lead 210	126	6.1	2.5E-14	1.2E-15	2E-15	6 E-13	Day	4.2
Radium 226	0.04	0.1	8.4E-18	2.0E-17	1E-16	9 E-13	Week	0.00093
Thorium 230	0.20	0.2	4.0E-17	4.0E-17	1E-16	3 E-14	Year	0.13
Uranium	0.5		1.0E-16		1E-16	9 E-14	Year	0.11

# Regional Sampling Locations



4 Air Monitoring Station, Rain, Soil, Water Station



**Appendix J**

**Environmental OSL Monitoring Results**

**First and Second Quarter, 2025**

**Crow Butte Resources**  
**Crow Butte Uranium Project**  
**Perimeter Air Monitoring Stations**

**Gamma Exposure Results**

Location	Exposure of Dosimeter		Net Cumulative Totals		
	(mrems ambient dose equivalent)				
	Gross	Net	Calendar Quarter	Year to Date	Permanent
<b>1/1/2025 to 3/31/2025</b>					
Transient Control	--	0.0	Q1	2025	--
Deploy Control	18.9	0.0	--	--	--
AM-1	27.8	9.0	9.0	9.0	669.7
AM-2	31.2	12.3	12.3	12.3	687.1
AM-3	33.4	14.6	14.6	14.6	770.0
AM-4	32.1	13.2	13.2	13.2	620.4
AM-5	33.4	14.6	14.6	14.6	755.3
AM-6	29.8	10.9	10.9	10.9	682.7
AM-8	33.0	14.1	14.1	14.1	836.5
AM-9	31.9	13.1	-	-	--

mrem – millirems

AM-1 air sampling locations

Minimum Detectable Dose = 0.1 mrems ambient dose equivalent

**Crow Butte Resources**  
**Crow Butte Uranium Project**  
**Perimeter Air Monitoring Stations**

**Gamma Exposure Results**

Location	Exposure of Dosimeter		Net Cumulative Totals		
	(mrems ambient dose equivalent)				
	Gross	Net	Calendar Quarter	Year to Date	Permanent
<b>4/1/2025 - 6/30/2025</b>					
Transient Control	--	0.0	Q2	2025	--
Deploy Control	24.2	0.0	--	--	--
AM-1	38.9	14.3	14.3	23.3	684.0
AM-2	41.0	16.4	16.4	28.7	703.5
AM-3	41.5	16.9	16.9	31.4	786.9
AM-4	33.6	9.0	9.0	22.2	629.4
AM-5	34.9	10.3	10.3	24.9	765.5
AM-6	37.0	12.4	12.4	23.3	695.1
AM-8	41.3	16.7	16.7	30.8	853.1
AM-9	41.3	16.7	-	--	--

mrem – millirems

AM-1 air sampling locations

Minimum Detectable Dose = 0.1 mrems ambient dose equivalent

**Appendix K**

**Radonova Radon Monitoring Results, Raw Data**

**First and Second Quarter, 2025**

# RADON MONITORING REPORT

## Description of the measurement

The measurement was performed with a closed alpha-track detector (Rapidos®) following the measurement protocols given by AARST/ANSI.

The detector(s) arrived to Radonova Laboratories **07/11/2025**.  
They were measured **07/16/2025**.

*Test data have been given by Tami Dyer*

## Property data and address

**MEASURE SITE ADDRESS**  
Crow Butte Resources  
86 Crow Butte Road  
CRAWFORD NE 69339

**BUILDING ID**

TRANSIT DETECTOR 1: 908429 ( $1 \pm 11$  pCi\*days/l)  
TRANSIT DETECTOR 2: 149387 ( $8 \pm 11$  pCi\*days/l)  
TRANSIT DETECTOR 3: 836296 ( $6 \pm 11$  pCi\*days/l)

## Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	LOCATION TYPE	RADON RESULT
603522-4 [Rapidos®]	01/01/2025 – 07/01/2025	AM-1	Out-door	0.11 ± 0.06 pCi/L
933782-5 [Rapidos®]	01/01/2025 – 07/01/2025	AM-2	Out-door	0.16 ± 0.09 pCi/L
612690-8 [Rapidos®]	01/01/2025 – 07/01/2025	AM-3	Out-door	0.27 ± 0.09 pCi/L
955775-2 [Rapidos®]	01/01/2025 – 07/01/2025	AM-4	Out-door	0.16 ± 0.09 pCi/L
328623-4 [Rapidos®]	01/01/2025 – 07/01/2025	AM-5	Out-door	0.16 ± 0.09 pCi/L
214615-7 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6a	Out-door	0.16 ± 0.06 pCi/L
342464-5 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6b	Out-door	0.19 ± 0.09 pCi/L
103612-8 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6c	Out-door	0.14 ± 0.06 pCi/L
686139-7 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6d	Out-door	0.16 ± 0.09 pCi/L

## Comment to the results

### Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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1 EAST 22nd STREET, SUITE 200  
LOMBARD, IL 60148  
331.814.2200, help@radonova.com

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86 Crow Butte Road  
CRAWFORD NE 69339

**BUILDING ID**

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	LOCATION TYPE	RADON RESULT
726597-8 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6e	Out-door	0.11 ± 0.06 pCi/L
425921-4 [Rapidos®]	01/01/2025 – 07/01/2025	AM-6f	Out-door	0.16 ± 0.09 pCi/L
672532-9 [Rapidos®]	01/01/2025 – 07/01/2025	AM-8	Out-door	0.14 ± 0.06 pCi/L
235250-8 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9a	Out-door	0.08 ± 0.06 pCi/L
673768-8 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9b	Out-door	0.08 ± 0.06 pCi/L
589189-0 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9c	Out-door	0.11 ± 0.06 pCi/L
520869-9 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9d	Out-door	0.16 ± 0.09 pCi/L
469959-1 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9e	Out-door	0.16 ± 0.09 pCi/L
960069-3 [Rapidos®]	01/01/2025 – 07/01/2025	AM-9f	Out-door	0.11 ± 0.06 pCi/L
801884-8 [Rapidos®]	01/01/2025 – 07/01/2025	WH-9 Inside	In-door	<b>28.3 ± 5.7 pCi/L</b>
270764-4 [Rapidos®]	01/01/2025 – 07/01/2025	WH-9 Outside	Out-door	0.27 ± 0.09 pCi/L
326477-7 [Rapidos®]	01/01/2025 – 07/01/2025	WH-10 Inside	In-door	<b>13.2 ± 2.7 pCi/L</b>

## Comment to the results

### Trygve Rönnqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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# RADON MONITORING REPORT

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*Test data have been given by Tami Dyer*

## Property data and address

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86 Crow Butte Road  
CRAWFORD NE 69339

**BUILDING ID**

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	LOCATION TYPE	RADON RESULT
710491-2 [Rapidos®]	01/01/2025 – 07/01/2025	WH-10 Outdoor	Out-door	0.22 ± 0.09 pCi/L
172972-2 [Rapidos®]	01/01/2025 – 07/01/2025	WH-13 Inside	In-door	0.84 ± 0.14 pCi/L
672445-4 [Rapidos®]	01/01/2025 – 07/01/2025	WH-13 Outside	Out-door	0.16 ± 0.09 pCi/L
142926-5 [Rapidos®]	01/01/2025 – 07/01/2025	WH-19 Inside	In-door	3.1 ± 0.41 pCi/L
401434-6 [Rapidos®]	01/01/2025 – 07/01/2025	WH-19 Outside	Out-door	0.19 ± 0.09 pCi/L
354090-3 [Rapidos®]	01/01/2025 – 07/01/2025	WH-25 Inside	In-door	<b>4.0 ± 0.52 pCi/L</b>
620273-3 [Rapidos®]	01/01/2025 – 07/01/2025	WH-25 Outside	Out-door	0.14 ± 0.09 pCi/L
672754-9 [Rapidos®]	01/01/2025 – 07/01/2025	WH-30 Inside	In-door	2.7 ± 0.36 pCi/L
974163-8 [Rapidos®]	01/01/2025 – 07/01/2025	WH-30 Outside	Out-door	0.14 ± 0.06 pCi/L
753983-6 [Rapidos®]	01/01/2025 – 07/01/2025	WH-34 Inside	In-door	<b>4.8 ± 0.63 pCi/L</b>
787987-7 [Rapidos®]	01/01/2025 – 07/01/2025	WH-34 Outside	Out-door	0.22 ± 0.09 pCi/L
465244-2 [Rapidos®]	01/01/2025 – 07/01/2025	WH-57 Inside	In-door	0.89 ± 0.14 pCi/L

## Comment to the results

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Signature Radonova Laboratories Laboratory Measurement Specialist

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*Test data have been given by Tami Dyer*

## Property data and address

**MEASURE SITE ADDRESS**  
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86 Crow Butte Road  
CRAWFORD NE 69339

**BUILDING ID**

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	LOCATION TYPE	RADON RESULT
523559-3 [Rapidos®]	01/01/2025 – 07/01/2025	WH-57 Outside	Out-door	0.14 ± 0.06 pCi/L
733363-6 [Rapidos®]	01/01/2025 – 07/01/2025	WH-63 Inside	In-door	0.86 ± 0.14 pCi/L
763135-1 [Rapidos®]	01/01/2025 – 07/01/2025	WH-63 Outside	Out-door	0.11 ± 0.06 pCi/L
560516-7 [Rapidos®]	01/01/2025 – 07/01/2025	Hallway by Office 8	In-door	0.46 ± 0.09 pCi/L
303324-8 [Rapidos®]	01/01/2025 – 07/01/2025	Lunchroom	In-door	0.43 ± 0.09 pCi/L
385188-8 [Rapidos®]	01/01/2025 – 07/01/2025	Lab- HPT	In-door	0.38 ± 0.09 pCi/L
754591-6 [Rapidos®]	01/01/2025 – 07/01/2025	Shaker Room Blower	In-door	<b>10.1 ± 1.6 pCi/L</b>
775524-2 [Rapidos®]	01/01/2025 – 07/01/2025	Box Fan Behind Acid Scrubber	In-door	0.95 ± 0.14 pCi/L
984540-5 [Rapidos®]	01/01/2025 – 07/01/2025	PWT (east) Box Fan	In-door	1.6 ± 0.22 pCi/L
639125-4 [Rapidos®]	01/01/2025 – 07/01/2025	PWT (west) Box Fan	In-door	2.2 ± 0.30 pCi/L
533757-1 [Rapidos®]	01/01/2025 – 07/01/2025	PWT Stack	In-door	2.0 ± 0.28 pCi/L
330797-2 [Rapidos®]	01/01/2025 – 07/01/2025	Lab	In-door	0.73 ± 0.11 pCi/L

## Comment to the results

### Trygve Rönnqvist (Electronically signed)

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# RADON MONITORING REPORT

## Description of the measurement

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The detector(s) arrived to Radonova Laboratories **07/11/2025**.

They were measured **07/16/2025**.

*Test data have been given by Tami Dyer*

## Property data and address

**MEASURE SITE ADDRESS**

Crow Butte Resources  
86 Crow Butte Road  
CRAWFORD NE 69339

**BUILDING ID**

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	LOCATION TYPE	RADON RESULT
664749-9 [Rapidos®]	01/01/2025 – 07/01/2025	Inj. Filters (plant)	In-door	3.8 ± 0.49 pCi/L
307695-7 [Rapidos®]	01/01/2025 – 07/01/2025	Blower pipe Between Inj.	In-door	2.5 ± 0.33 pCi/L
937951-2 [Rapidos®]	01/01/2025 – 07/01/2025	Control Room	In-door	0.41 ± 0.09 pCi/L
675342-0 [Rapidos®]	01/01/2025 – 07/01/2025	R.O. Building North	In-door	0.57 ± 0.09 pCi/L
774867-6 [Rapidos®]	01/01/2025 – 07/01/2025	R.O. Building South	In-door	1.2 ± 0.19 pCi/L

## Comment to the results

**Trygve Rönnqvist (Electronically signed)**

Signature Radonova Laboratories Laboratory Measurement Specialist

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LOMBARD, IL 60148  
331.814.2200, help@radonova.com

## Measurement method: Closed alpha-track detector

The radon measurement was performed with a closed alpha-track detector following the quality assurance guidance given in the ANSI/AARST protocols. The detector container is manufactured from electrically conducting plastic. Through a small slit (filter), radon gas enters the detector. The track-detecting material (film) inside the detector is hit by alpha particles generated by the radon entering the container and the decay products formed from it. On the film, the alpha particles make small tracks which are enlarged through chemical etching and later counted in a microscope in order to determine the radon exposure.

Transit detectors are used for the return delivery of the high-sensitivity detectors in order to make a more accurate background subtraction.

Radonova Laboratories (P.O. Box 6522, SE-751 38 UPPSALA, Sweden) is accredited (no. 1489) by SWEDAC to conduct radon-gas measurements using the closed alpha-track detector method. The analysis equipment is checked daily and the detectors are calibrated at regular intervals. NRPP Licenses: 107831 AL, 107830 RT

## Measured radon concentrations

For each detector, the measured value of the radon concentration is provided. For each value an uncertainty associated with the measurement to a 95% confidence level is also provided. For example a measurement result of  $4.0 \pm 0.5$  pCi/L means that the radon concentration is most likely contained in the range 3.5 - 4.5 pCi/L. If the start or end date of the measurement has not been provided, the radon concentration cannot be calculated. In such cases, the total exposure in pCi\*days/L will be reported. The reported measured values are related to the detectors as received by Radonova Laboratories. Detector deployment is not performed by Radonova Laboratories. Measurement information such as monitoring period (dates) and placement location is provided to Radonova Laboratories by the end user. The presented result applies only to the sample tested as received by the laboratory.

The average transit exposure has been subtracted in the reported radon concentrations.

## Codes on non-reportable detectors

<b>DNR</b>	Not Reported – Detector Not Returned
<b>VTW</b>	Not Reported – Visibly Tampered With
<b>FBD</b>	Not Reported – Film Broken or Damaged
<b>LIL</b>	Not Reported – Lost in Lab
<b>DTO</b>	Not Reported – Detector Too Old

## Measurement method versions used when the report was created

*ANSI/AARST MAH-2023, Protocol for Conducting Measurements of Radon and Radon Decay Products in Homes*

*ANSI/AARST MA-MFLB-2023, Protocol for Measurements of Radon in Multifamily, School, Commercial and Mixed-Use Buildings*

## Signature on the report

With the signature on the report, the person responsible for the radon analysis at Radonova Laboratories hereby certifies that the measurement procedures follows the guidance in accordance with the ANSI/AARST Measurement Protocols and that the demands from SWEDAC are fulfilled.

Measurement information displayed in italics on report has been provided by the customer.

## Certification no:

107831-AL, 107830-RMP, NRSB ARL1904, NY ELAP ID: 12042,, RMB-1199



Accred. no. 1489  
Testing  
ISO/IEC 17025

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LOMBARD, IL 60148  
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