

**CAMECO RESOURCES
CROW BUTTE OPERATION**



**86 Crow Butte Road
P.O. Box 169
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**(308) 665-2215
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October 17, 2022

Electronic Submittal

DOCUMENT CONTROL DESK, DIRECTOR
U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

The enclosed report was provided to NDEE.

Class III UIC Permit NE0122611
September 2022 Monthly Restoration Report

Please find enclosed the Crow Butte Monthly Restoration Reports for Mine Units 2, 3, 4, 5, 6, 7 and 8. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Units 6, 7, and 8. Mine Units 2, 3, 4 and 5 remained in stability monitoring.

If you have any questions regarding this submittal, please feel free to contact me at (308) 665-2215, ext. 121.

Sincerely,
Cameco Resources
Crow Butte Operation



Tate Hagman
Restoration Manager

Enclosures: As Stated

cc: Ron Burrows; Document Control Desk; Deputy Director, Division of Decommissioning – NRC
CBO - File
ec: CR – Electronic File
Kory Winters – NDEE Field Office
Amanda Osborn – NDEE Program Coordinator

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 2

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment		X	
d. Wellfield Recirculatoion		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 3

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment		X	
d. Wellfield Recirculatoion		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 4

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment		X	
d. Wellfield Recirculatoion		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

No in-house samples were collected during the month.

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 5

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment		X	P1002
d. Wellfield Recirculatoion		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

P1002

Mine Unit 5 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P1002													
	9/13/2022	336	16.33	165	4.24	398	345	1910	8.07	1184	-0.01	0.95	0.29

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 6

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		I1274P P1399 P1461 P1532 P1628 P1663 P1742
d. Wellfield Recirculatoin		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

I1274P
 P1399
 P1461
 P1532
 P1628
 P1663
 P1742

Mine Unit 6 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I1274P													
	9/13/2022	408	11.28	147	2.95	404	299	1864	7.87	1156	0.01	0.96	0.26
P1399													
	9/13/2022	464	26.33	196	6.26	484	395	2279	8.08	1413	0.01	1.16	0.17
P1461													
	9/13/2022	365	16.31	167	4.25	409	346	1939	8.04	1202	0.00	0.99	0.35
P1532													
	9/13/2022	374	13.36	160	3.42	409	333	1928	7.78	1195	-0.01	0.36	0.07
P1628													
	9/13/2022	296	7.70	110	2.22	290	207	1368	8.39	848	0.00	0.67	0.51
P1663													
	9/13/2022	377	13.85	163	4.30	395	300	1865	8.15	1156	0.00	0.52	0.33
P1742													
	9/13/2022	231	3.08	54	0.71	177	92	820	8.9	508	0.00	0.46	2.30

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 7

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		IX and RO <div style="display: flex; justify-content: space-between; margin-top: 5px;"> BL-17 I2429P P5271 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> CM4-14 P2038 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> CM4-15 P2040 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> CM4-16 P2316 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> CM4-17 P2359 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> I1971P P2384 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> I1973P P2476 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> I1975P P2505 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> I2183P P2523 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> I2185P P5230 </div>
d. Wellfield Recirculation		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

BL-17	P2384
CM4-14	P2476
CM4-15	P2505
CM4-16	P2523
CM4-17	P5230
I1971P	P5271
I1973P	
I1975P	
I2183P	
I2185P	
I2429P	
P2038	
P2040	
P2316	
P2359	

Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17													
	9/13/2022	364	6.97	53	1.55	244	112	1104	8.08	684	-0.01	0.41	1.68
CM4-14													
	9/13/2022	708	44.78	174	12.30	577	460	2732	7.53	1694	-0.01	2.28	0.42
CM4-15													
	9/13/2022	803	61.55	219	17.44	691	590	3227	7.4	2001	-0.01	0.99	0.51
CM4-16													
	9/13/2022	619	7.57	149	1.53	166	80	2396	7.48	1486	-0.01	0.18	0.68
CM4-17													
	9/13/2022	528	33.11	138	9.92	422	308	2032	7.73	1260	0.02	0.45	0.09
I1971P													
	9/13/2022	619	36.00	128	9.41	492	378	2292	7.51	1421	0.00	0.99	0.30
I1973P													
	9/13/2022	608	24.59	101	5.88	441	297	2036	7.8	1262	0.00	2.70	0.63
I1975P													
	9/13/2022	835	59.70	219	18.00	697	588	3295	7.56	2043	-0.01	4.10	0.27
I2183P													
	9/13/2022	503	38.25	129	8.61	404	309	1961	7.55	1216	-0.01	4.73	0.85
I2185P													
	9/13/2022	762	41.26	162	12.60	618	487	2826	7.61	1752	-0.01	2.17	2.11
I2429P													
	9/13/2022	400	26.23	162	7.28	408	344	1979	7.74	1227	-0.01	1.95	0.35
P2038													
	9/13/2022	616	45.76	165	13.19	534	468	2568	7.32	1592	0.01	2.09	0.22
P2040													
	9/13/2022	747	60.59	209	20.09	661	600	3154	7.36	1955	-0.01	2.16	0.19
P2316													
	9/13/2022	511	45.03	122	10.89	396	322	1974	7.48	1224	0.00	1.81	0.49
P2359													
	9/13/2022	504	29.31	110	7.91	387	292	1879	7.55	1165	0.02	2.43	0.31
P2384													
	9/13/2022	640	54.45	193	15.57	581	536	2805	7.42	1739	0.00	3.76	0.53
P2476													
	9/13/2022	310	15.41	84	3.25	255	176	1222	7.78	758	0.03	0.60	0.64
P2505													
	9/13/2022	314	18.91	152	3.68	354	292	1714	7.85	1063	-0.01	0.36	0.63
P2523													
	9/13/2022	242	38.30	49	11.28	502	401	793	7.59	492	-0.01	0.74	0.36

Mine Unit 7 Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P5230													
	9/13/2022	699	42.45	164	11.30	582	471	2693	7.67	1670	0.04	2.69	0.65
P5271													
	9/13/2022	617	33.29	142	9.02	479	361	2269	7.66	1407	0.00	1.19	0.66

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
September 2022
Mine Unit 8

1. RESTORATION ACTIVITY DURING MONTH:

	YES	NO	
a. Groundwater Transfer		X	(if yes, complete part 2)
b. Groundwater Sweep		X	(if yes, complete part 3)
c. Groundwater Treatment	X		IX and RO CM6-11 P2734 P3208 P6110 CM6-21 P2758 P3209 P6127 CM6-24 P2764 P3246 I2671P P2808 P3253 I2685P P2855 P3266 I2688P P2904 P3277 I2791 P2908 P3287 I3699P P2952 P3415 P2700 P3178 P3441 P2724 P3189 P6103
d. Wellfield Recirculatoin		X	
e. Other (explain):		X	

2. LIST WELLS USED IN GROUNDWATER TRANSFER DURING THE MONTH:

3. LIST WELLS USED IN GROUNDWATER SWEEP DURING THE MONTH:

4. LIST WELLS SAMPLED DURING THE MONTH: (Assay results attached)

CM6-11	P2845
CM6-21	P2855
CM6-24	P2904
I2671P	P2908
I2685P	P2952
I2688P	P2977
I2791P	P3178
I3699P	P3189
P2700	P3208
P2703	P3209
P2724	P3441
P2734	P3735
P2758	
P2764	
P2808	

Mine Unit 8		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
CM6-11													
	9/13/2022	332	15.93	135	3.87	345	275	1634	8.03	1013	-0.01	0.36	0.06
CM6-21													
	9/13/2022	391	12.00	125	2.90	357	243	1629	8.08	1010	0.00	4.76	0.23
CM6-24													
	9/13/2022	254	4.88	56	1.20	193	103	882	8.64	547	0.00	0.76	0.72
I2671P													
	9/13/2022	471	9.68	111	2.80	389	244	1746	8.24	1083	0.01	2.15	1.05
I2685P													
	9/13/2022	310	4.26	72	0.96	249	137	1125	8.61	698	-0.01	1.65	0.98
I2688P													
	9/13/2022	571	19.56	201	5.97	527	351	2397	7.99	1486	0.00	5.79	1.08
I2791P													
	9/13/2022	0	85.22	0	21.93	1078	919	4864	7.95	3016	0.12	7.83	0.11
I3699P													
	9/13/2022	0	83.70	0	24.47	1233	1102	5654	7.62	3505	-0.01	10.88	0.45
P2700													
	9/13/2022	509	30.88	248	8.32	540	437	2582	8.14	1601	0.00	0.80	0.20
P2703													
	9/13/2022	350	20.51	184	4.47	400	332	1960	8.16	1215	0.00	0.07	0.08
P2724													
	9/13/2022	470	10.70	147	4.02	427	285	1940	8.23	1203	-0.01	2.78	1.96
P2734													
	9/13/2022	273	2.23	64	0.57	219	124	988	8.44	613	0.00	1.19	1.44
P2758													
	9/13/2022	337	3.99	88	1.18	288	184	1300	8.42	806	-0.01	0.98	1.65
P2764													
	9/13/2022	256	4.61	70	1.34	215	125	997	8.28	618	0.00	1.20	1.23
P2808													
	9/13/2022	258	3.73	58	0.80	199	101	902	8.63	559	0.00	0.74	2.46
P2845													
	9/13/2022	494	30.99	219	7.84	494	379	2354	8	1459	0.00	1.43	2.00
P2855													
	9/13/2022	284	6.45	72	1.67	230	132	1074	8.37	666	0.00	0.96	0.69
P2904													
	9/13/2022	394	17.19	136	4.59	360	260	1712	8.12	1061	0.01	1.29	0.55
P2908													
	9/13/2022	281	5.00	57	1.13	215	117	987	8.59	612	0.01	2.42	0.64

Mine Unit 8 – Restoration Data

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2952													
	9/13/2022	424	17.42	144	4.59	399	298	1840	8.06	1141	0.03	2.46	0.32
P2977													
	9/13/2022	195	8.26	41	1.80	140	70	675	8.42	419	0.00	0.26	0.49
P3178													
	9/13/2022	294	6.35	79	1.76	247	154	1141	8.28	707	0.01	1.45	0.55
P3189													
	9/13/2022	244	9.76	71	2.16	217	145	1036	8.07	642	0.00	0.46	0.15
P3208													
	9/13/2022	397	12.81	127	3.30	370	265	1683	8.13	1043	0.04	1.37	0.19
P3209													
	9/13/2022	319	7.22	94	1.91	288	191	1336	8.22	828	0.01	2.73	0.30
P3441													
	9/13/2022	867	50.81	0	15.21	938	760	4248	7.65	2634	-0.01	8.07	0.35
P3735													
	9/13/2022	0	83.12	0	26.77	1187	1023	5341	7.76	3311	-0.01	18.27	0.63