

**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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March 11, 2019

**USPS PRIORITY MAIL  
SIGNATURE CONFIRMATION**

Marty Link, Water Quality Division Administrator  
Nebraska Department of Environmental Quality  
P.O. Box 98922  
Lincoln, NE 68509-8922

Class III UIC Permit NE0122611  
February 2019 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the February 2019 Monthly Restoration Reports for Mine Units 2, 3, 4, 5, 6 and 7. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Unit 6 as well as Mine Unit 7. Composite guideline 8 samples were collected from baseline restoration wells in Mine Units 3, 4, and 5 to continue with stability monitoring in those Mine Units.

Mine Unit 2 remained in stability monitoring.

If you have any questions regarding this submittal, please feel free to contact me at (308) 665-2215, ext. 117.

Sincerely,  
Cameco Resources  
Crow Butte Operation

Walter D. Nelson  
SHEQ Coordinator

Enclosures: As Stated

cc: Ron Burrows – NRC  
CBO - File  
ec: CR – Electronic File  
Kory Winters – NDEQ Field Office  
Amanda Jones – NDEQ Program Coordinator

CROW BUTTE MINE  
MONTHLY RESTORATION REPORT

February 2019

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 Recirculation		X	
e. Other (explain):	X		The Mine Unit is in Stability Monitoring.

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

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

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4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

No wells were sampled during the month.

**CROW BUTTE MINE**  
**MONTHLY RESTORATION REPORT**

February 2019

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 Recirculation		X	
e. Other (explain):		X	Weather and operational issues prevented the collection of restoration stability samples in February.

**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 MONTH AND ASSAY RESULTS:**

No in-house samples were collected during the month.

CROW BUTTE MINE

MONTHLY RESTORATION REPORT

February 2019

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 Recirculation		X	
e. Other (explain):	X		Weather and operational issues prevented the collection of restoration stability samples in February.

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 MONTH AND ASSAY RESULTS:

No in-house samples were collected during the month.

CROW BUTTE MINE  
MONTHLY RESTORATION REPORT

February 2019

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	
d. Wellfield Recirculation		X	
e. Other (explain):	X		Weather and operational issues prevented the collection of restoration stability samples in February.

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

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

P1002

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

No in-house samples were collected during the month.

**CROW BUTTE MINE**  
**MONTHLY RESTORATION REPORT**

February 2019

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		IX and RO P1265, I1267P, I1272P, P1314, P1315, P1377, P1402, P1428, P1494, P1625, P1628, P1676, P1690.
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:**

P1461, P1569.

**4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:**

P1265, I1267P, I1272P, P1314, P1315, P1377, P1402, P1428, P1461, P1494, P1625, P1628, P1676, P1690.

**Mine Unit 6****Restoration Data**

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I1267P													
	2/22/2019	374	18.60	177	5.36	372	294	1923	7.84	1192	0.00	0.60	0.277
I1272P													
	2/22/2019	465	25.54	205	6.88	457	380	2361	7.9	1464	0.01	1.57	0.058
P1265													
	2/22/2019	408	19.18	183	5.39	400	326	2048	8.22	1270	0.01	0.69	0.028
P1314													
	2/22/2019	512	14.76	155	4.31	404	250	1978	8.14	1226	0.02	3.94	1.438
P1315													
	2/22/2019	452	22.42	198	6.08	442	360	2284	7.95	1416	0.02	0.58	0.179
P1377													
	2/22/2019	396	21.30	186	5.22	395	322	2031	7.92	1259	0.00	1.12	0.061
P1402													
	2/22/2019	431	15.20	155	3.91	380	263	1864	7.92	1156	0.03	1.99	0.323
P1428													
	2/22/2019	336	17.60	208	4.51	413	380	2119	7.95	1314	0.00	2.67	0.11
P1461													
	2/22/2019	380	19.09	220	5.29	452	408	2310	8.14	1432	0.00	1.95	0.426
P1494													
	2/22/2019	387	13.52	149	3.59	361	279	1848	8.03	1146	0.02	2.28	0.252
P1625													
	2/22/2019	421	17.28	162	4.96	373	262	1853	8.09	1149	0.00	2.80	1.253
P1628													
	2/22/2019	336	7.76	131	2.54	316	238	1604	8.46	994	0.00	1.11	0.988
P1676													
	2/22/2019	713	36.44	339	11.49	732	588	3505	7.99	2173	0.00	4.67	1.127
P1690													
	2/22/2019	442	15.60	145	4.41	358	244	1831	8.21	1135	0.01	2.36	0.119

**CROW BUTTE MINE**  
**MONTHLY RESTORATION REPORT**

February 2019

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 BL-17, P1957, P1972, P1986, P2014, P2038, P2040, P2108, P2125, P2188, P2219, P2241, P2264, P2303, P2316, P2340, P2359, P2361, P2384, P2395, P2399, P2401, I2429P, P2476, I2429P, P2476, P2510, P2523, P2538, P2588, P2601, P2610, P2612, P2614, P2642, P2660, P5271, P5278, P5279.
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 MONTH AND ASSAY RESULTS:**

BL-17, P1569, P1957, P1972, P1986, P2014, P2038, P2040, P2108, P2125, P2188, P2219, P2241, P2264, P2303, P2316, P2340, P2359, P2361, P2395, P2399, P2401, I2429P, P2476, P2510, P2523, P2538, P2588, P2601, P2610, P2612, P2614, P2642, P2660, P5271, P5278, P5279.



Mine Unit 7		Restoration Data											
Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-17	2/22/2019	917	49.58	314	14.95	795	640	3835	7.81	2378	0.00	2.80	1.536
I2429P	2/22/2019	925	60.21	241	17.54	756	652	3711	7.43	2301	0.04	13.05	0.81
P1569	2/22/2019	500	33.95	234	9.13	502	439	2616	7.92	1622	0.02	0.49	0.1
P1957	2/22/2019	577	35.17	144	8.73	449	360	2294	7.35	1422	0.01	3.50	0.497
P1972	2/22/2019	786	57.17	243	17.01	711	674	3532	7.32	2190	0.01	6.18	0.683
P1986	2/22/2019	776	49.49	324	15.80	742	686	3716	7.56	2304	0.00	5.03	0.996
P2014	2/22/2019	757	44.04	198	12.11	611	482	2993	7.36	1856	0.00	1.85	0.524
P2038	2/22/2019	1104	83.74	342	24.55	969	913	4618	7.14	2863	0.00	6.59	0.281
P2040	2/22/2019		107.40	401	34.31	1158	1145	5500	7.18	3410	0.00	9.44	0.162
P2108	2/22/2019	895	63.58	286	17.97	806	733	3933	7.43	2438	0.00	4.57	0.208
P2125	2/22/2019		109.30	438	30.20	1185	1163	5512	7.36	3417	0.03	10.30	0.279
P2188	2/22/2019	577	31.52	264	9.21	583	522	2943	7.86	1825	0.00	9.01	1.032
P2219	2/22/2019	625	44.76	181	11.39	530	471	2693	7.19	1670	0.01	2.19	0.241
P2241	2/22/2019	602	36.41	277	11.48	627	561	3083	7.66	1911	0.00	3.32	0.911
P2264	2/22/2019	486	18.48	130	5.36	365	238	1841	8.07	1141	0.00	0.93	0.704
P2303	2/22/2019	797	57.42	241	17.33	697	625	3394	7.2	2104	0.01	1.72	0.306
P2316	2/22/2019		117.10	438	36.58	1178	1177	5658	7.23	3508	0.00	4.56	1.119
P2340	2/22/2019	789	62.44	240	17.29	665	599	3319	7.29	2058	0.03	2.84	0.191
P2359	2/22/2019		92.67	58	27.82	1128	1128	5261	7.27	3262	0.01	11.82	0.372

**Mine Unit 7 Restoration Data**

Well ID	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P2361	2/22/2019		108.20	397	30.30	1166	1192	5502	7.6	3411	0.00	7.36	0.705
P2384	2/22/2019	1003	68.78	246	20.66	825	756	3976	7.52	2465	0.00	4.71	1.16
P2395	2/22/2019	764	58.43	178	14.80	552	448	2836	7.53	1758	0.03	4.24	0.487
P2399	2/22/2019	813	69.76	226	18.13	656	598	3306	7.54	2050	0.01	16.11	0.776
P2401	2/22/2019	908	68.70	269	18.09	769	707	3814	7.76	2365	0.00	3.05	0.586
P2476	2/22/2019		76.93	370	25.13	1013	951	4906	7.47	3042	0.00	3.76	1.323
P2510	2/22/2019	571	32.85	202	8.24	512	426	2537	7.64	1573	0.00	3.22	0.749
P2523	2/22/2019	763	47.89	263	13.70	712	640	3461	7.4	2146	0.00	6.08	0.588
P2538	2/22/2019	743	39.24	177	11.23	571	434	2782	7.6	1725	0.00	1.26	1.805
P2588	2/22/2019		96.04	420	30.65	1104	1102	5401	7.56	3349	0.00	4.83	1.137
P2601	2/22/2019	636	41.77	263	11.53	591	513	3030	7.62	1879	0.04	1.84	0.893
P2610	2/22/2019		98.81	419	28.31	1137	1087	5301	7.4	3287	0.00	5.68	1.257
P2612	2/22/2019	1043	72.24	309	22.03	932	887	4477	7.4	2776	0.00	7.78	1.238
P2614	2/22/2019	672	43.09	277	13.13	615	532	3105	7.94	1925	0.00	1.37	0.249
P2642	2/22/2019	467	25.36	241	7.05	486	429	2500	7.93	1550	0.01	1.71	0.528
P2660	2/22/2019	870	74.79	264	19.28	786	769	3814	7.5	2365	0.00	2.80	0.575
P5271	2/22/2019	1019	77.42	275	21.31	842	791	4249	7.35	2634	0.00	8.11	0.933
P5278	2/22/2019		84.68	347	26.24	1016	989	4877	7.35	3024	0.00	2.81	2.26
P5279	2/22/2019		125.50	479	34.99	1270	1330	6026	7.73	3736	0.02	25.06	1.262