

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

January 11, 2016

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

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

Class III UIC Permit NE0122611
December 2015 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the December 2015 Monthly Restoration Reports for Mine Units 2, 3, 4, 5 and 6. The reverse osmosis (RO) units continue to inject permeate and reductant into Mine Units 4, and 5, with groundwater sweep continuing in portions of the two mine units. IX treatment was resumed in Mine Unit 6 with the new piping changes that were made over the past six months.

Mine Units 2 and 3 remain in stability monitoring.

If you have any questions regarding this submittal, please feel free to contact me at (308) 665-2215, ext. 114.

Sincerely,
Cameco Resources
Crow Butte Operation

Larry Teahon
SHEQ Manager

Enclosures: As Stated

cc: Ron Burrows - NRC
CBO - File
cc: CR - Casper
Nancy Harris - NDEQ Program Coordinator
Lena Vishni - NDEQ - Chadron Field Office

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 DECEMBER 2015
 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:

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

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

No samples were collected during the month.

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 DECEMBER 2015
 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		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 MONTH AND ASSAY RESULTS:

No samples were collected during the month.

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 DECEMBER 2015
 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		RO and Reductant CM2-2, I539P, I546P, and I547P.
d. Wellfield Recirculation		X	
e. Other (explain):			

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

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

CM2-4, P372, P391, P392, I535P, I536P, I543P, I544P, I545P, P6023, P6024, and P6029.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL9, BL17, CM2-1, CM2-2, CM2-4, P372, P391, P392, I535P, I539P, I543P, I544P, I545P, I546P, I547P, P6023, P6024 and P6029.

Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
BL-17	12/1/2015		72.06	361.0	20.45	1040.0	1023.0	4651	7.49	3250		0.001	6.216	1.661
	12/15/2015		78.05	364.0	21.58	1054.0	947.7	4691	7.42	3257		-0.004	5.672	1.640
BL-9	12/1/2015	474.0	39.84	238.0	5.97	417.9	379.4	2295	7.83	1432		0.306	2.621	0.069
CM2-1	12/1/2015	309.0	18.07	84.0	3.72	178.9	126.4	1060	7.75	637		0.159	0.759	0.072
CM2-2	12/1/2015	623.0	55.43	338.0	13.79	601.7	545.0	3121	6.70	2050		0.002	3.390	0.349
	12/15/2015	610.0	53.08	323.0	12.77	583.0	500.6	3029	7.51	1975		-0.001	3.208	0.331
	12/22/2015		49.96		12.59	586.5	489.2						3.008	0.305
CM2-4	12/1/2015	371.0	15.22	140.0	3.76	297.8	232.1	1582	7.61	1006	0.028	0.021	0.666	0.071
	12/15/2015	375.0	15.98	142.0	3.94	318.0	233.1	1620	7.83	1025		0.015	0.657	0.038
	12/22/2015		15.72		3.93	316.3	234.7						0.635	0.055
I535P	12/1/2015	520.0	31.40	242.0	8.79	518.8	470.5	2621	7.44	1686	0.012	-0.001	2.855	0.116
	12/15/2015	515.0	31.61	255.0	8.65	521.1	453.4	2592	7.76	1660		-0.004	2.816	0.106
I536P	12/1/2015	440.0	21.80	155.0	6.08	354.9	288.0	1853	7.57	1146	0.013	-0.003	6.013	0.171
	12/15/2015	449.0	24.50	154.0	6.70	381.0	289.8	1891	7.78	1168		-0.004	6.014	0.163
	12/22/2015		22.41		5.94	343.9	278.1						5.763	0.160
I539P	12/1/2015	475.0	21.68	191.0	6.06	399.8	307.1	2061	7.50	1268	0.025	0.010	2.822	0.173
	12/15/2015	465.0	22.33	176.0	6.00	401.6	289.0	1994	7.89	1229		0.008	2.619	0.172
	12/22/2015		21.67		5.83	398.3	277.5						2.428	0.183
I543P	12/1/2015		132.90	450.0	34.48	997.8	1031.0	5109	6.21	3345	0.007	-0.004	14.200	0.257
	12/15/2015		128.60	428.0	31.92	977.8	948.8	4905	7.23	3307		-0.005	13.720	0.235
I544P														

Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
	12/1/2015	848.0	96.47	328.0	24.86	734.4	694.9	3770	6.54	2531	0.025	-0.002	10.210	0.456
	12/15/2015	875.0	99.96	337.0	25.29	737.3	706.1	3853	7.28	2591		-0.004	10.510	0.428
I545P	12/1/2015	728.0	75.68	318.0	19.48	618.7	587.2	3366	6.83	2236	0.023	-0.002	4.600	0.453
	12/15/2015	727.0	77.30	321.0	19.52	637.5	578.4	3328	7.34	2207		-0.004	4.620	0.464
	12/22/2015		72.97		18.75	617.1	567.6						4.547	0.429
I546P	12/1/2015	885.0	106.80	473.0	26.78	835.3	801.1	4373	7.53	2906	0.012	0.044	3.934	0.098
	12/15/2015	895.0	109.00	475.0	27.20	862.3	806.7	4444	7.28	2937		0.049	3.917	0.087
	12/22/2015		108.10		26.79	852.9	792.4						3.749	0.079
I547P	12/1/2015	715.0	52.96	243.0	13.88	606.0	604.4	3164	6.58	2080	0.027	0.076	4.257	0.211
	12/15/2015	734.0	57.69	272.0	15.32	680.3	618.1	3276	7.22	2166		0.087	4.472	0.209
P372	12/1/2015	579.0	41.76	278.0	10.22	530.5	468.3	2721	6.98	1755		0.047	17.300	0.183
	12/15/2015	577.0	41.50	267.0	9.99	537.4	459.2	2729	7.32	1760		0.047	16.990	0.192
	12/22/2015		37.98		9.48	509.4	450.5						15.870	0.164
P391	12/1/2015	401.0	17.17	154.0	4.53	346.0	270.3	1752	7.77	1095	0.015	-0.001	1.671	0.156
	12/15/2015	394.0	17.27	143.0	4.45	350.3	266.1	1713	8.06	1074		-0.004	1.612	0.145
P392	12/1/2015	899.0	96.64	349.0	24.28	770.1	772.3	4016	6.82	2664	0.019	-0.002	4.814	0.348
	12/15/2015	885.0	98.84	360.0	24.35	781.5	751.8	3967	7.34	2643		-0.005	4.876	0.338
	12/22/2015		91.06		23.00	800.4	779.0						4.853	0.327
P6023	12/1/2015	661.0	44.11	239.0	11.83	628.2	609.7	3073	6.26	2008		0.007	2.039	0.036
	12/15/2015	683.0	47.17	225.0	12.57	657.8	618.7	2924	7.16	1900		0.007	2.145	0.018
P6024	12/1/2015	831.0	78.53	332.0	19.67	738.0	715.1	3700	9.38	2474		0.050	2.019	0.053

Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
	12/15/2015	815.0	77.80	305.0	18.59	713.3	678.1	3639	7.23	2427		0.048	1.957	0.045
	12/22/2015		75.78		17.99	681.7	673.2						1.925	0.042
P6029														
	12/1/2015		165.90	474.0	41.87	1090.0	1173.0	5736	6.45	3610		0.128	14.990	0.102
	12/15/2015		179.40	452.0	42.32	1113.0	1183.0	5701	7.18	3591		0.137	13.800	0.101
	12/22/2015		174.80		42.24	1193.0	1238.0						13.390	0.087

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 DECEMBER 2015
 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		RO and Reductant P693, P796, I854P, P859, P1156, and P1259.
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:
 BL5-3, BL5-4, BL5-5, CPW-1, P837, and P1117.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL5-3, BL5-4, BL5-5, CM3-3, CPW1, I678P, P683, I685P, P693, P789, P796, P837, I854P,
 P859, P889, P1117, I1126P, P1156, and P1259

Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
BL5-3	12/1/2015	408	27.18	190	6.64	399.2	387.2	2153	7.64	1323		0.07	0.091	0.015
BL5-4	12/1/2015	405	19.96	166	4.86	372.1	326.1	1898	7.72	1172	0.00	0.04	0.267	0.019
	12/15/2015	391	20.24	155	4.83	367.7	301.7	1822	7.94	1130		0.04	0.236	-0.055
	12/22/2015		18.63		4.37	338.3	284.7						0.204	0.020
BL5-5	12/1/2015	369	24.63	215	5.90	409.2	418.8	2173	7.80	1337	0.00	0.07	0.196	0.000
	12/15/2015	355	24.55	203	5.88	424.0	399.1	2083	8.01	1281		0.04	0.223	0.004
	12/22/2015		22.66		5.30	384.9	388.5						0.202	0.011
CM3-3	12/15/2015	332	9.57	95	2.31	286.9	191.3	1317	8.06	826		0.06	4.072	0.447
CPW-1	12/1/2015	500	32.60	248	8.02	485.9	443.0	2559	8.02	1636		0.08	1.976	0.103
	12/15/2015	508	35.34	247	8.92	544.4	477.5	2602	7.91	1668		0.08	2.014	0.105
	12/22/2015		33.97		7.93	488.7	448.7						1.844	0.089
I1126P	12/1/2015	273	6.76	82	1.40	190.5	141.7	1034	8.35	620		0.26	1.645	0.576
I678P	12/15/2015	447	20.10	140	4.18	403.7	305.5	1841	8.19	1140		0.06	5.292	0.269
I685P	12/1/2015	544	30.31	277	8.19	566.9	543.5	2929	7.07	1904		0.01	5.1	0.502
I693P	12/1/2015	357	14.54	182	3.35	406.4	375.5	1995	7.76	1229		0.01	6.78	0.957
	12/15/2015	357	15.38	190	3.49	407.0	363.9	1986	8.08	1224		0.00	6.524	0.933
I854P	12/1/2015		13.63		3.36	346.9	321.5					0.00	0.87	0.022
	12/15/2015		14.84		3.82	390.9	334.6					0.00	0.933	0.021
	12/22/2015		14.86		3.62	371.9	333.8						0.88	0.012
P1117	12/1/2015	338	14.69	185	3.90	375.3	364.7	1974	7.71	1216		0.05	1.9	0.123
	12/15/2015	335	15.43	188	4.09	398.3	362.2	1950	7.95	1204		0.04	1.865	0.117
	12/22/2015		14.31		3.78	374.2	354.1						1.749	0.121
P1156	12/1/2015	403	16.42	163	4.17	363.9	301.7	1864	7.80	1153	0.02	0.00	2.828	0.282
	12/15/2015	411	17.97	168	4.44	384.7	304.3	1895	7.99	1170		0.00	2.822	0.267

Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1259	12/22/2015		16.93		4.14	365.4	293.7						2.747	0.243
	12/1/2015	484	13.02	142	3.63	365.2	236.8	1784	7.79	1110		0.00	6.764	1.214
	12/15/2015	490	13.99	141	3.97	395.7	247.9	1818	8.02	1128		0.00	6.898	1.236
P683	12/22/2015		13.00		3.53	356.3	232.1						6.354	1.152
	12/1/2015	172	3.90	53	0.83	116.6	80.2	644	8.17	405	0.24	0.09	0.729	0.405
P789	12/15/2015	177	3.74	46	0.83	134.9	71.2	641	8.20	404		0.09	0.657	0.474
	12/1/2015	290	13.40	166	2.85	296.7	328.0	1681	8.03	1056	0.03	0.00	1.076	0.085
P796	12/1/2015	360	18.91	161	4.36	343.4	318.4	1851	7.67	1145		0.01	0.716	0.022
	12/15/2015	366	21.40	162	4.81	382.1	328.2	1884	7.90	1164		0.01	0.728	0.019
	12/22/2015		18.87		4.36	361.6	324.9						0.703	0.015
P837	12/1/2015	390	22.40	179	5.66	361.6	330.1	1943	7.79	1199	0.02	0.02	1.456	0.146
	12/15/2015	391	23.94	172	6.02	388.0	333.9	1937	7.89	1195		0.02	1.443	0.148
	12/22/2015		22.03		5.50	363.9	318.6						1.323	0.145
P859	12/1/2015	343	17.18	182	4.37	368.5	335.6	1916	7.88	1182		0.02	1.621	0.558
	12/15/2015	341	17.01	182	4.37	383.9	344.8	1908	8.15	1178		0.01	1.589	0.497
	12/22/2015		15.71		3.96	362.9	329.5						1.511	0.434
P889	12/1/2015	301	20.69	190	2.86	327.1	346.3	1779	8.11	1108		0.01	3.98	0.142
	12/15/2015	314	14.46	190	3.31	379.9	328.5	1830	7.98	1134		0.01	3.647	0.147

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 DECEMBER 2015
 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 P1265, P1268, P1312, P1314, P1318, P1336, P1337, P1344, P1358, P1374, P1377, P1396, P1399, P1402, P1404, P1421, P1428, P1439, P1461, and P1469.
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:

P1265, P1268, P1312, P1314, P1318, P1336, P1337, P1344, P1374, P1377, P1396, P1399, P1402, P1404, P1421, P1428, P1439, P1449 and P1469.

MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1265	12/15/2015			46.42	12.43	680.8	593.7					0.00	0.919	0.144
	12/22/2015			43.43	11.75	629.5	566.1						0.752	0.133
P1268	12/15/2015			73.48	20.84	1008.0	804.5					-0.01	11.130	1.822
	12/22/2015			68.46	18.43	922.0	795.2						9.502	1.777
P1312	12/1/2015			59.16	16.00	901.0	768.4					0.00	15.430	0.89
	12/15/2015			71.46	18.03	1029.0	791.2					0.02	15.480	1.02
	12/22/2015			64.75	16.80	977.0	780.8						15.140	0.969
P1314	12/15/2015			58.09	18.09	1016.0	768.6					0.09	10.970	1.586
	12/22/2015			53.26	15.74	896.1	760.8						10.100	1.568
P1318	12/1/2015			49.02	15.20	976.2	808.6					0.00	6.609	1.282
P1336	12/1/2015			77.00	21.95	1157.0	934.5					0.00	21.510	0.746
	12/15/2015			74.12	20.99	1150.0	876					-0.01	17.770	0.886
	12/22/2015			67.33	24.16	1167.0	915.6						16.580	0.883
P1337	12/1/2015			64.04	19.76	1118.0	928.4					0.00	19.320	1.421
	12/15/2015			45.42	14.16	967.4	718.2					-0.01	13.010	1.303
	12/22/2015			35.11	10.68	801.7	640.1						10.690	1.171
P1344	12/15/2015			40.34	11.57	756.6	575.7					-0.01	8.667	1.078
	12/22/2015			33.61	9.78	665.0	559.8						7.430	0.931
P1374	12/1/2015			56.33	17.10	1049.0	843.7					0.00	23.820	1.356
	12/15/2015			54.82	16.94	1093.0	813.1					-0.01	20.010	1.398
	12/22/2015			48.76	14.49	953.7	778						17.710	1.241
P1377	12/1/2015			87.42	19.45	876.5	827.8					0.00	12.940	0.24
	12/15/2015			70.87	17.06	843.1	763.1					0.01	10.110	0.203
	12/22/2015			63.00	14.82	754.1	764.2						8.531	0.188
P1396	12/15/2015			18.29	4.60	399.7	383.4					0.04	0.098	-0.003

MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1399	12/22/2015			18.20	4.43	368.5	402.6						0.113	0.033
	12/1/2015			91.69	21.30	920.4	892.9					0.00	9.570	0.335
	12/15/2015			91.88	21.28	955.7	874.6					0.05	8.407	0.327
P1402	12/22/2015			81.66	18.49	861.5	863.3						7.580	0.3
	12/1/2015			85.32	20.49	1071.0	918.6					0.00	19.840	0.11
	12/15/2015			91.82	22.02	1152.0	952.8					0.32	20.780	0.108
	12/22/2015			90.80	20.90	1093.0	949.6						20.270	0.106
P1404	12/1/2015			74.88	19.39	1021.0	869					0.00	9.597	0.147
	12/15/2015			79.84	20.26	1043.0	832					0.07	9.112	0.149
	12/22/2015			76.95	19.05	1017.0	851.9						9.017	0.138
P1421	12/1/2015			35.11	8.92	575.5	579.3					0.00	4.483	0.286
P1428	12/1/2015			29.16	6.84	506.9	541.3					0.00	10.950	0.095
	12/15/2015			38.62	9.17	603.4	580.6					0.06	17.810	0.135
	12/22/2015			35.92	8.16	552.8	534.4						18.430	0.163
P1439	12/1/2015			65.26	19.30	1141.0	956.2					0.00	10.230	1.225
	12/15/2015			67.78	20.28	1211.0	949.2					-0.01	11.030	1.242
	12/22/2015			64.93	18.92	1133.0	895.5						10.220	1.163
P1449	12/1/2015			70.47	19.30	1128.0	926.6					0.00	20.990	0.273
P1469	12/15/2015			79.81	23.73	1047.0	807.7						4.266	0.49
	12/15/2015			79.81	23.73	1047.0	807.7					0.04	4.266	0.49
	12/22/2015			70.32	19.69	881.4	806.6						3.881	0.618