

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

June 21, 2017

**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
May 2017 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the May 2017 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, 5, and 6 with groundwater sweep continuing in portions of the three mine units.

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
ec: CR – Electronic File
Dave Miesbach – NDEQ Groundwater Unit Supervisor
Kory Winters – NDEQ Field Office

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 MAY 2017
 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 wells were sampled during the month.

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 MAY 2017
 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 wells were sampled during the month.

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 MAY 2017
 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 BL-9, BL-19, CM2-1, P392, P410, P430, I539P, I542P, I543P, I544P, I545P, I546P, P6023, P6024, and P6029.
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:

BL-10, CM1-7, CM2-4, and P372.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL-10, BL-19, CM1-7, P392, P410, P430, I543P, I544P, I545P, I546P, P6023, P6024, and P6029.

Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-10	5/2/2017	340.0	10.67	111.0	2.92	266.2	193.0	1400	7.95	880	0.001	2.396	0.294
BL-19	5/2/2017	246.0	2.52	50.0	0.69	161.9	79.2	822	7.97	532	0.008	1.487	0.299
CM1-7	5/2/2017	381.0	12.04	126.0	3.50	308.3	238.4	1615	7.77	1022	-0.001	1.897	0.077
I543P	5/2/2017	561.0	29.12	130.0	8.36	396.2	304.0	2074	7.57	1276	-0.001	2.631	0.100
I544P	5/2/2017	895.0	95.50	313.0	26.17	746.9	762.5	3976	7.26	2647	0.003	6.094	0.333
I545P	5/2/2017	601.0	40.20	194.0	11.07	451.2	388.9	2456	7.40	1559	0.001	2.910	0.316
I546P	5/2/2017	651.0	51.76	214.0	14.26	522.4	478.0	2786	7.27	1797	0.038	1.584	0.051
P392	5/2/2017	613.0	44.47	167.0	11.69	446.6	402.0	2413	7.55	1529	-0.002	2.259	0.237
P410	5/2/2017	588.0	41.08	177.0	11.09	438.4	394.8	2376	7.46	1501	-0.001	3.189	0.225
P430	5/2/2017	422.0	19.20	154.0	5.49	345.0	254.7	1792	7.66	1115	0.005	2.065	0.124
P6023	5/2/2017	477.0	26.14	148.0	7.44	398.1	370.7	2099	7.23	1291	0.016	1.344	-0.013
P6024	5/2/2017	519.0	31.52	147.0	8.25	399.3	337.8	2058	7.23	1267	0.051	0.704	0.008
P6029	5/2/2017		161.10	454.0	42.48	1189.0	1298.0	6018	7.11	3785	0.247	7.546	0.026

CROW BUTTE MINE
MONTHLY RESTORATION REPORT
MAY 2017
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 I685P, P691, and P694.
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:
P699, and P1002.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL5-2, BL5-3, BL5-4, BL5-5, BL-14, BL-16, CM2-9, CM2-10, CM3-1, CM3-2, CM3-3, CM5-11, CM5-19, CPW-1, I675P, I676P, I678P, P679, P680, I685P, I687P, I688P, I689P, P690, P691, I692P, I693P, P694, P695, I696P, I698P, P699, P700, P701, P751, P789, I792P, P810, P889, P908, P1003, P1050, P1075, P1117, I1126P, P1137, P1155, P1209, and P1885.

Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
BL-14	5/2/2017	216	8.54		1.00	137.2	91.3	718	8.30	503	0.020	0.121	0.016
BL16	5/2/2017	348	7.52	71	1.61	240.1	163.4	1219	7.34	731	0.139	0.706	0.022
BL5-2	5/2/2017	301	7.30	82	1.86	232.8	164.2	1188	8.36	713	0.206	0.407	0.017
BL5-3	5/2/2017	493	31.53	245	8.43	497.5	468.9	2548	7.95	1628	0.103	0.052	0.051
BL5-4	5/2/2017	311	15.39	135	4.17	354.3	280.5	1795	6.53	1116	0.081	0.225	0.027
BL5-5	5/2/2017	186	4.96	51	1.02	135.7	92.8	727	8.36	508	0.359	0.063	0.023
CM2-10	5/2/2017	369	22.52	130	3.64	312.4	253.7	1612	8.12	1021	0.077	9.238	0.050
CM2-9	5/2/2017	239	3.78	332	1.01	139.2	64.8	700	8.65	490	0.820	0.467	0.033
CM3-1	5/2/2017	209	9.14	58	0.96	142.6	84.8	762	8.49	526	0.256	0.230	0.225
CM3-2	5/2/2017	167	3.00	35	0.39	116.4	81.5	608	8.37	397	0.013	0.030	0.010
CM3-3	5/2/2017	303	8.89	87	2.06	250.1	197.1	1268	8.12	800	0.281	4.098	0.329
CM5-11	5/25/2017	306	15.40	179	3.60	405.0	386.0	1916				0.010	0.020
CM5-19	5/16/2017	301	16.90	177		379.0	382.0	1895				0.020	0.010
CPW-1	5/11/2017	314	6.67	82	1.34	242.3	159.9	1283	8.35	807		1.812	-0.032
I1126P	5/2/2017	281	16.47	73	1.09	175.0	85.7	936	8.59	585	0.112	1.370	0.364
I675P	5/2/2017	242	5.28	72	0.95	207.5	161.8	1054	8.00	636	0.176	0.289	0.217
I676P	5/2/2017	371	13.72	128	2.73	319.3	257.9	1632	8.12	1031	0.054	2.800	0.222
I678P	5/2/2017	388	13.64	102	2.64	306.9	246.7	1552	8.30	989	0.119	4.452	0.189
I685P													

Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
I687P	5/2/2017	432	17.51	172	5.05	395.6	374.7	2104	7.98	1292	-0.002	2.091	0.284
I688P	5/2/2017	359	18.15	178	3.59	373.9	362.3	1960	8.05	1211	0.046	10.230	0.213
I689P	5/2/2017	301	15.00	197	2.98	359.4	357.4	1907	7.78	1177	0.092	3.591	0.049
I692P	5/2/2017	367	32.54	206	4.50	388.3	389.7	2116	7.89	1300	0.139	2.792	0.168
I693P	5/2/2017	453	14.96	132	3.59	375.3	290.2	1838	8.06	1138	0.126	4.625	0.125
I696P	5/2/2017	305	11.48	117	1.92	272.0	223.0	1416	8.27	889	0.061	2.639	0.242
I698P	5/2/2017	287	14.69	164	2.47	332.6	330.7	1737	8.20	1086	0.067	1.170	0.084
I792P	5/11/2017	308	15.13	181	3.34	363.7	361.8	1962	8.08	1212		0.907	0.441
P1003	5/11/2017	292	15.88	191	3.03	368.0	373.8	1995	7.72	1229		1.526	0.027
P1050	5/11/2017	295	19.68	182	3.44	373.8	378.1	2035	7.90	1253		3.133	0.232
P1075	5/11/2017	246	11.38	143	1.53	289.5	276.4	1576	8.02	1002		0.746	0.244
P1117	5/11/2017	242	9.54	142	1.84	291.4	280.0	1585	7.82	1007		1.205	0.046
P1137	5/11/2017	266	12.64	151	3.34	325.3	317.9	1772	8.06	1104		0.468	0.145
P1155	5/11/2017	291	10.24	110	1.70	266.5	215.7	1442	8.43	907		1.982	0.584
P1209	5/11/2017	352	22.99	177	3.63	386.5	362.2	2109	8.11	1295		2.833	0.024
P1885	5/11/2017	169	4.19	23	0.50	99.2	35.6	534	8.29	356		0.358	0.462
P679	5/11/2017	222	7.06	148	1.29	287.4	282.2	1573	7.88	1000		0.601	0.053
P680	5/11/2017	326	8.10	82	1.26	261.5	183.7	1294	7.75	813		1.691	0.079
	5/11/2017	298	6.54	100	1.11	261.6	196.3	1333	7.96	836		2.127	0.106

Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P690	5/11/2017	104	7.57	39	0.11	69.1	22.6	405	8.21	244		0.110	0.150
P691	5/11/2017	256	8.26	85	1.88	215.9	152.0	1159	8.13	697		1.707	0.610
P694	5/2/2017	381	10.48	129	2.83	319.5	249.4	1634	7.98	1032	0.027	2.561	0.240
P695	5/11/2017	365	8.64	111	1.53	290.3	186.0	1531	8.21	975		2.553	0.179
P699	5/2/2017	345	12.82	172	3.82	374.8	370.0	1949	8.00	1203	0.000	1.160	1.137
P700	5/11/2017	319	22.40	196	5.04	381.6	388.5	2072	7.78	1274		1.022	0.134
P701	5/11/2017	304	15.19	197	3.56	385.5	386.3	2073	7.96	1275		0.549	0.745
P751	5/11/2017	356	6.22	58	0.90	227.4	106.6	1116	8.27	675		4.988	0.651
P789	5/11/2017	305	16.24	188	3.83	375.5	371.9	1982	7.65	1222		1.726	-0.015
P810	5/11/2017	315	13.55	25	1.85	315.1	271.9	1649	8.19	1040		1.670	0.017
P889	5/11/2017	299	15.12	191	3.12	370.9	357.6	1947	7.81	1201		4.142	0.153
P908	5/11/2017	301	15.53	190	3.33	366.9	353.6	1955	7.93	1208		2.078	0.047

CROW BUTTE MINE
 MONTHLY RESTORATION REPORT
 MAY 2017
 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		RO and Reductant P1265, P1268, P1273, P1288, P1314, P1315, P1348, P1355, P1402, P1404, P1426, P1440, P1449, P1461, P1467, P1494, P1532, P1582, P1584, P1585, P1598, P1704, P1721, P1751, P1765, P1779, P1800, P1810, P1890.
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:

P1476 and P1611.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

P1273, P1288, P1314, P1315, P1402, P1404, P1426, P1440, P1449, P1461, P1467, P1476, P1494, P1532, P1582, P1585, P1598, P1611, P1704, P1721, P1765, P1779, P1800, P1810, and P1890.

MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P1273	5/2/2017	398	159	19.83	5.12	336.6	273.6	1740	7.72	1087	0.16	3.203	0.406
P1288	5/2/2017	565	284	37.45	10.05	560.1	511.7	2879	7.56	1867	0.01	5.933	0.104
P1314	5/2/2017	706	313	29.74	9.74	641.5	559.1	3281	7.90	2171	0.01	3.462	0.968
P1315	5/2/2017	499	258	32.10	8.85	519.1	501.3	2707	7.85	1744	0.03	0.476	0.136
P1402	5/2/2017	478	152	20.36	5.15	390.2	292.3	1968	7.69	1214	0.07	2.824	0.392
P1404	5/2/2017	597	223	29.90	7.97	488.8	384.6	2551	7.92	1629	0.02	2.645	0.460
P1426	5/2/2017	333	174	17.31	4.68	353.5	343.1	1902	7.83	1174	0.02	2.455	0.130
P1440	5/2/2017	446	138	15.30	4.95	342.7	239.4	1764	7.94	1100	0.01	1.816	2.302
P1449	5/2/2017	642	131	15.11	4.21	447.7	275.1	2142	7.95	1316	0.05	9.620	1.380
P1461	5/2/2017	396	233	20.78	5.77	433.3	433.1	2315	7.97	1448	0.00	2.155	0.503
P1467	5/2/2017	426	140	10.04	3.36	353.3	258.0	1757	8.27	1096	0.01	2.746	1.707
P1476	5/2/2017	409	181	15.24	4.28	398.7	370.9	2103	8.03	1292	0.01	5.515	0.500
P1494	5/2/2017	439	205	18.86	5.12	419.4	376.1	2188	7.66	1349	0.03	2.722	0.380
P1532	5/2/2017	504	171	20.38	5.31	429.7	341.1	2123	7.57	1305	0.06	0.796	0.012
P1582	5/2/2017	370	186	15.44	4.57	396.6	368.3	2001	8.11	1232	0.00	1.369	1.052
P1585	5/2/2017		498	54.28	20.58	1023.0	798.8	4935	7.49	3312	0.00	4.798	1.004
P1598	5/2/2017	304	62	5.09	1.51	197.5	96.6	964	8.80	590	0.01	3.673	2.344
P1611	5/2/2017	338	201	15.32	4.32	384.4	397.9	2050	8.01	1261	0.02	3.009	0.356
P1704													

MU6.Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	Fe	U	V
P1721	5/2/2017	415	174	12.52	3.72	389.4	340.0	2015	7.78	1241	0.12	3.663	0.388
P1765	5/2/2017	610	220	20.46	6.89	504.1	381.3	2515	7.77	1610	0.01	5.871	1.319
P1779	5/2/2017	640	232	22.33	6.35	551.6	443.8	2738	7.82	1765	0.05	9.298	0.666
P1800	5/2/2017	869	408	51.62	17.25	814.5	684.2	4053	7.54	2680	0.00	7.181	2.289
P1810	5/2/2017	759	320	44.84	12.60	655.5	531.8	3346	7.56	2221	0.00	5.022	0.415
P1890	5/2/2017	423	154	10.64	3.66	364.3	288.4	1842	8.25	1141	0.00	2.170	1.017
	5/2/2017	484	166	21.92	6.21	386.8	287.0	1965	7.64	1213	0.04	10.070	0.620