

**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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October 14, 2015

**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  
September 2015 Monthly Restoration Report

Dear Ms. Link:

Please find enclosed the September 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 suspended on May 11, 2015 in Mine Unit 6 so that piping changes can be made to allow for RO treatment. A small wellfield bleed continues in this mine unit for excursion control.

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 - Casper  
Nancy Harris - NDEQ Program Coordinator  
Shar Sapp - NDEQ - Chadron Field Office

CROW BUTTE MINE  
MONTHLY RESTORATION REPORT  
SEPTEMBER 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  
 SEPTEMBER 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  
 SEPTEMBER 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 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:

BL10, CM1-7, CM2-4, P372, P391, P392, P410, P430, I535P, I536P, I543P, I544P, I545P, P6023, P6024, and P6029.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL8, BL9, BL10, BL17, BL18, CM2-4, CM3-10, P372, P391, P392, P393, P394, P410, P430, I508P, I535P, I536P, I539P, I542P, I543P, I544P, I545P, I546P, I547P, I548P, I549P, I550P, I551P, 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-10	9/16/2015		15.54			328.1	232.1						3.228	0.338
	9/22/2015	423.0	15.22	129.0	3.73	321.2	222.2	1674	7.86	1052		0.002	3.065	0.337
BL-17	9/22/2015		77.28	369.0	20.66	1003.0	917.5	4941	7.44	3314		0.002	5.245	1.516
BL-18	9/22/2015	404.0	11.14	116.0	2.60	301.8	229.0	1632	8.03	1031		0.009	3.700	0.602
BL-8	9/22/2015	367.0	9.46	92.0	1.98	240.4	142.8	1317	8.09	829		0.028	2.220	0.064
BL-9	9/22/2015	438.0	20.52	192.0	5.00	392.1	334.0	2144	7.84	1317		0.228	1.963	0.048
CM2-4	9/16/2015		15.03			339.6	268.1						0.650	0.040
	9/22/2015	391.0	15.09	161.0	3.85	343.8	266.5	1800	7.81	1119		0.032	0.641	0.035
	9/29/2015		13.37		3.32	289.5	204.9						0.671	0.079
CM3-10	9/22/2015	315.0	13.37	100.0	3.01	223.8	164.0	1283	7.95	807		0.028	0.454	0.160
I508P	9/22/2015	298.0	7.44	75.0	1.28	196.1	108.9	1077	8.35	645		0.019	1.513	0.129
I535P	9/16/2015		34.06			537.3	466.4						2.917	0.110
	9/22/2015	545.0	34.65	271.0	9.25	535.3	465.1	2745	7.76	1771		0.002	2.889	0.110
	9/29/2015		35.76		9.54	546.5	474.3						2.905	0.112
I536P	9/16/2015		28.11			398.2	332.8						8.147	0.154
	9/22/2015	476.0	27.69	177.0	7.30	407.3	331.0	2093	7.77	1287		0.000	8.039	0.154
	9/29/2015		29.40		7.82	433.0	334.9						7.734	0.175
I539P	9/16/2015		25.91			437.1	351.6						3.071	0.153
	9/22/2015	496.0	25.92	209.0	7.10	441.8	347.9	2263	7.90	1408		0.023	3.029	0.151
	9/29/2015		26.28		7.08	437.3	352.8						3.004	0.156

# Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
I542P	9/22/2015	936.0	119.50	376.0	31.30	742.1	801.7	4247	7.60	2843		0.088	9.112	0.178
I543P	9/16/2015		142.40			1086.0	1094.0						16.450	0.230
	9/22/2015		169.60	496.0	41.73	1102.0	1089.0	5558	7.22	3496		-0.002	16.220	0.253
	9/29/2015		169.20		41.19	1088.0	1089.0						15.740	0.249
I544P	9/16/2015		79.23			629.6	602.7						6.669	0.416
	9/22/2015	777.0	81.38	303.0	20.69	634.6	601.2	3441	7.34	2277		0.001	7.173	0.407
	9/29/2015		86.35		22.09	657.6	636.4						7.740	0.430
I545P	9/16/2015		66.89			555.3	501.7						4.609	0.459
	9/22/2015	683.0	72.73	310.0	18.44	588.3	528.9	3137	7.35	2060		0.001	4.833	0.450
	9/29/2015		74.60		18.75	589.5	542.6						4.792	0.462
I546P	9/16/2015		82.72			789.3	728.2						3.946	0.144
	9/22/2015	835.0	98.27	481.0	24.68	793.3	723.6	4283	7.35	2862		0.065	3.781	0.070
	9/29/2015		100.30		25.09	810.7	745.9						3.736	0.072
I547P	9/16/2015		51.31			608.4	569.6						4.405	0.210
	9/22/2015	699.0	50.07	244.0	13.51	599.5	548.6	3098	7.24	2029		0.316	4.368	0.217
	9/29/2015		50.67		13.32	595.8	557.2						4.249	0.219
I548P	9/22/2015	231.0	6.65	72.0	1.06	170.6	110.9	942	7.87	586		0.035	0.196	0.052
I549P	9/22/2015	290.0	17.27	98.0	2.87	219.4	178.7	1273	7.54	803		3.314	0.424	0.033
I550P	9/22/2015	305.0	24.41	163.0	4.18	301.0	302.9	1738	7.31	1086		0.697	0.083	0.042
I551P	9/22/2015	460.0	20.66	122.0	4.53	317.3	244.1	1767	7.92	1102		0.019	4.763	0.384
P372														

# Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P390	9/16/2015		42.34			543.5	462.5						18.130	0.184
	9/22/2015	595.0	42.35	283.0	10.51	544.0	465.3	2892	7.38	1878		0.058	18.190	0.180
	9/29/2015		43.31		10.63	545.8	475.1						17.980	0.203
P391	9/22/2015	258.0	6.19	85.0	1.34	191.2	129.2	1054	8.22	636		0.013	0.580	0.107
P392	9/16/2015		21.72			394.7	332.1						1.931	0.146
	9/22/2015	419.0	21.19	188.0	5.54	387.5	324.4	2018	8.02	1243		0.002	1.859	0.141
	9/29/2015		20.80		5.47	386.1	326.7						1.866	0.146
P393	9/16/2015		92.31			761.3	747.5						4.259	0.308
	9/22/2015	877.0	99.05	374.0	24.53	772.2	740.5	3995	7.42	2654		0.001	4.204	0.324
	9/29/2015		101.70		25.30	770.8	749.1						4.403	0.321
P394	9/22/2015	255.0	27.44	65.0	3.82	129.7	105.2	841	8.24	536		0.005	0.108	0.010
P410	9/22/2015	313.0	13.94	97.0	2.23	226.8	170.1	1280	7.85	806		0.135	0.096	0.011
	9/16/2015		130.60			866.3	882.2						5.989	0.351
P430	9/22/2015	1051.0	145.70	433.0	35.19	869.5	892.7	4640	7.35	3248		0.003	6.049	0.349
	9/16/2015		15.71			325.4	226.2						2.022	0.223
	9/22/2015	409.0	15.46	133.0	4.02	318.5	217.9	1658	7.73	1044		0.003	1.972	0.214
P6023	9/16/2015		34.41			525.8	484.9						1.017	0.018
	9/22/2015	568.0	34.19	202.0	8.49	525.1	488.9	2677	7.15	1722		0.007	1.040	0.014
	9/29/2015		36.87		9.05	535.7	513.6						1.087	0.017
P6024	9/16/2015		39.98			780.7	726.9						2.599	0.029
	9/22/2015	868.0	81.62	354.0	20.15	766.5	712.1	4016	7.32	2664		0.053	2.565	0.029

# Mine Unit 4 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
	9/29/2015		83.25		20.23	770.2	718.3						2.505	0.029
P6029														
	9/16/2015		161.70			1091.0	1137.0						18.390	0.057
	9/22/2015		181.80	459.0	42.84	1099.0	1121.0	5553	7.22	3494		0.149	18.360	0.075
	9/29/2015		186.60		43.89	1114.0	1154.0						18.220	0.054



CROW BUTTE MINE  
 MONTHLY RESTORATION REPORT  
 SEPTEMBER 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 I678P, P683, P695, P789, P796, P810, I854P, I1126P, P1156, P1239, and, I1246P.
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, I693P, P837, P859, P908, P1117, P1203, P1213, and P1259.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

BL5-3, BL5-4, BL5-5, CPW1, I678P, P693, P695, P789, P796, P810, P837, P908, P1117,  
 I1126P, P1156, P1203, P1239, 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														
	9/16/2015		47.23			659.9	631.8						0.099	0.023
	9/22/2015	551	48.50	311	11.78	614.2	599.7	3072	7.81	2008		0.11	0.102	
	9/29/2015		47.80		11.30	591.6	569.8						0.1	0.006
BL5-4														
	9/16/2015		29.72			480.0	433.5						0.429	0.012
	9/22/2015	506	30.14	214	7.37	484.5	430.5	2424	7.88	1536		0.07	0.413	
	9/29/2015		29.58		7.15	461.0	415.3						0.4	0.019
BL5-5														
	9/16/2015		40.76			577.3	587.4						0.296	0.022
	9/22/2015	471	41.85	322	10.16	570.0	569.9	3012	7.99	1964		0.10	0.29	
	9/29/2015		40.86		9.89	567.5	583.0						0.283	0.023
CPW-1														
	9/22/2015	519	33.48	246	8.16	512.7	448.3	2649	7.94	1704		0.09	2.016	
I1126P														
	9/22/2015	250	6.24	80	1.41	197.4	135.0	1057	8.45	636		0.01	1.548	
I678P														
	9/16/2015		14.10			297.7	240.1						3.108	0.459
	9/22/2015	352	14.42	119	3.16	304.0	237.1	1573	8.20	1000		0.01	3.062	
I693P														
	9/16/2015		16.48			413.6	403.1						6.806	0.532
	9/22/2015	374	16.22	208	3.67	418.2	391.9	2188	8.08	1349		0.07	6.606	
	9/29/2015		16.41		3.55	416.8	398.0						6.447	0.605
P1117														
	9/16/2015		15.85			387.2	380.1						1.764	0.112
	9/22/2015	345	15.79	199	4.18	393.7	373.4	2061	7.97	1268		0.06	1.736	
	9/29/2015		15.86		4.19	395.1	383.9						1.764	0.117
P1156														
	9/16/2015		19.15			397.3	337.0						2.743	0.238
	9/22/2015	442	19.72	181	4.98	409.7	338.8	2106	7.95	1293		0.00	2.774	
	9/29/2015		18.87		4.79	400.3	336.3						2.803	0.250
P1203														
	9/16/2015		16.47			359.5	341.1						1.058	0.230
	9/22/2015	317	16.01	172	3.78	350.2	334.3	1851	8.17	1145		0.01	1.017	
P1239														
	9/16/2015		15.59			349.4	317.0						2.591	0.568

# Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1259	9/22/2015	372	15.83	156	4.22	352.9	306.0	1862	8.22	1151		0.01	2.481	
	9/29/2015		15.08		4.03	340.5	297.3						2.435	0.669
	9/16/2015		17.07			426.9	297.9						8.484	1.297
P683	9/22/2015	553	16.50	163	4.61	426.1	283.9	2152	8.00	1322		0.01	8.221	
	9/29/2015		16.00		4.46	413.5	282.0						8.071	1.432
	9/16/2015		15.44			345.1	265.0						5.1	0.551
P695	9/22/2015	421	15.33	143	3.80	351.0	260.0	1795	7.98	1116		0.01	4.985	
	9/29/2015		14.97		3.69	337.3	254.7						4.773	0.613
	9/16/2015		14.84			405.2	301.0						9.385	0.606
P789	9/22/2015	455	13.89	167	3.93	388.6	278.6	1982	8.03	1222		0.06	8.455	
	9/29/2015		13.98		3.77	380.1	274.9						8.135	0.760
	9/16/2015		13.85			344.8	328.6						1.326	0.094
P796	9/22/2015	311	14.02	165	3.33	346.6	324.5	1776	7.82	1106		0.01	1.288	
	9/29/2015		13.80		3.26	341.6	328.5						1.352	0.098
	9/16/2015		17.17			302.0	269.3						0.67	0.027
P810	9/22/2015	321	17.36	139	3.95	304.1	264.3	1613	7.97	1021		0.03	0.652	
	9/29/2015		20.47		4.54	336.5	306.5						0.639	0.022
	9/16/2015		13.61			348.6	288.8						2.051	0.052
P837	9/22/2015	388	14.05	146	3.33	356.9	285.4	1790	8.08	1114		0.03	2.007	
	9/29/2015		25.21			391.0	355.3						1.473	0.119
	9/16/2015		23.14	174	5.78	373.1	327.6	1974	7.95	1216		0.02	1.352	
P859	9/29/2015		25.60		6.36	395.3	356.8						1.479	0.122
	9/16/2015		22.93			429.0	401.6						2.042	0.625
	9/22/2015	407	23.03	214	5.86	439.4	403.2	2296	8.06	1433		0.03	2.002	
P908	9/29/2015		22.60		5.70	430.2	398.1						1.956	0.673
	9/16/2015		13.83			359.4	345.3						3.159	0.082

# Mine Unit 5 Restoration Data

Well Name	Date	Alk	Ca	Cl	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
	9/22/2015	309	13.82	186	3.24	359.5	338.3	1869	8.00	1155		0.01	2.93	

CROW BUTTE MINE  
MONTHLY RESTORATION REPORT  
SEPTEMBER 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	
d. Wellfield Recirculation		X	
e. Other (explain):	X		IX treatment was suspended on May 11, 2015 so that piping changes can be made to the mine unit to allow for RO treatment. A small wellfield bleed continues for excursion control.

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

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

P1312 is being used to maintain an inward hydraulic gradient.

4. LIST WELLS SAMPLED DURING MONTH AND ASSAY RESULTS:

P1312.

# MU6 Restoration Data

Well Name	Date	Alk	Cl	Ca	Mg	Na	SO4	Cond	pH	TDS	As	Fe	U	V
P1312	9/16/2015			58.81		959.1	773.1						14.060	0.889
	9/22/2015			59.69	16.39	960.0	757.8				0.00		13.730	0.905
	9/29/2015			60.45	16.63	969.5	798.9						14.050	0.904