

**CAMECO RESOURCES
CROW BUTTE OPERATION**



**86 Crow Butte Road
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August 21, 2019

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

ATTN: Document Control Desk, Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Source Materials License SUA-1534
Docket No. 40-8943
SM6-23 Monitor Well Excursion - Final Report

Dear Document Control Desk:

On May 2, 2019, during routine biweekly water sampling of Cameco Resources, Crow Butte Operation (CBO) shallow monitor well SM6-23, the multiple parameter upper control limits (MCL) for alkalinity and conductivity were exceeded. As required by License Condition 11.1.5 of Source Materials License SUA-1534, a second sample was collected within 24 hours and analyzed for the three excursion indicator parameters. The results of the second sample exceeded the MCL for alkalinity and conductivity.

The region around the CBO facility was subject to a major winter storm on March 14 and 15, 2019, in which the site received an estimated 18" of snowfall accompanied by up to 90 mph wind gusts. As a result, a significant amount of snowmelt impacted the area around the well. This was followed by a second significant winter storm on April 10 and 11, 2019. The snowmelt from this storm provided additional impact to this part of the well field. This well was placed on excursion status in 2010, 2015, and 2016 during similar wet spring conditions. The site placed the well on a weekly sampling schedule, but no other corrective actions were taken. The parameters descended below excursion criteria as conditions have warmed and dried.

In accordance with License Condition 11.1.5 of the UIC permit, CBO increased the sampling frequency for SM6-23 to weekly. Weekly samples were obtained from May 3, 2019, to August 20, 2019. The samples collected on July 16, 23, and 30, as well as the samples collected on August 6, 13, and 20, 2019, were below the excursion criteria from License Condition 11.1.5 of the permit. Based on these results, CBO is removing SM6-23 from excursion status and is returning it to routine biweekly sampling. Attached are copies of the analytical data for each of

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CROW BUTTE RESOURCES, INC.



Document Control Desk, Director

August 21, 2019

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the last six weekly samples and graphs for each parameter covering the period of April 4, 2019 through August 20, 2019.

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

A handwritten signature in black ink, appearing to read "Walter D. Nelson", with a long, sweeping underline.

Walt Nelson
SHEQ Coordinator

Enclosures: As Stated

cc: NRC -- Deputy Director
 CBO - File

cc: CBO



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 07/16/2019

Analysis Date: 07/16/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM07-011	292	432	360	1910	2817	2347	187	281	234
CM07-012	292	422	352	1916	2794	2328	185	289	241
CM07-013	292	436	364	1927	2841	2368	182	287	239
CM07-014	292	422	352	1944	2772	2310	184	274	228
CM07-015	297	432	360	1943	2822	2352	186	284	236
CM07-016	306	441	367	1983	2831	2359	189	281	234
CM10-008	323	475	396	1858	2707	2256	170	265	221
CM10-009	315	468	390	1839	2693	2244	170	269	224
CM10-010	338	475	396	1949	2736	2280	183	275	229
CM10-011	324	481	401	1824	2808	2340	165	288	240
CM10-012	342	446	372	1862	2923	2436	174	327	272
CM10-013	345	481	401	1763	2779	2316	164	287	239
CM10-014	353	490	408	1786	2578	2148	166	251	209
CM10-015	329	504	420	1812	2491	2076	159	253	211
CM10-016	311	484	403	1850	2650	2208	160	253	211
CM10-017	323	475	396	1856	2664	2220	163	248	206
IJ013P	310	415	346	1277	2900	2417	100	278	232
PR008	329	484	403	1336	2866	2388	96	282	235
PR015	282	444	370	1099	2792	2327	78	268	223
SM03-001	206	374	312	667	1122	935	13	85	71
SM03-002	179	305	254	444	805	671	4.2	40	34
SM03-003	176	297	247	453	729	607	5.8	30	25
SM04-010A	294	354	295	708	1053	877	13	36	30
SM04-011A	286	554	462	694	1469	1224	12	139	115
SM06-023	266	314	262	564	691	576	8	23	19
SM06-028	307	351	293	734	778	648	13	24	20
SM07-015	141	200	167	326	495	413	3.5	24	20
SM07-016	139	199	166	327	451	376	3.5	24	20
SM07-017	181	209	174	411	539	449	3.9	30	25
SM07-018	139	217	181	335	513	427	3.1	23	19
SM07-019	142	212	176	345	599	499	4	38	31
SM07-020	147	228	190	339	583	486	2.1	28	23



Crow Butte Project

Monitor Well Laboratory Report

Sample Date: 07/23/2019

Analysis Date: 07/23/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM06-009	295	428	356	1911	2866	2388	180	285	238
CM06-010	290	429	358	1942	2952	2460	177	327	272
CM08-001	291	455	379	1936	3110	2592	176	372	310
CM08-002	300	395	329	1937	3125	2604	179	334	278
CM08-003	313	432	360	1980	3211	2676	187	367	306
CM08-004	296	428	356	1924	3125	2604	180	328	274
CM08-005	289	425	354	1906	3067	2556	179	328	274
CM08-006	301	432	360	1923	3067	2556	179	317	264
CM08-007	314	425	354	1927	3154	2628	180	396	330
CM08-008	314	418	348	1933	3211	2676	183	415	346
CM08-009	314	452	377	1857	3053	2544	173	325	271
CM09-008	299	418	348	1793	2952	2460	179	366	305
CM09-009	304	475	396	1782	2923	2436	177	334	278
CM09-010	302	359	299	1779	2390	1992	175	292	244
CM09-011	301	445	371	1797	2707	2256	176	284	236
CM11-012	298	433	361	1798	2794	2328	170	268	223
CM11-013	301	418	348	1786	2722	2268	173	291	242
CM11-014	303	468	390	1794	3024	2520	174	357	298
CM11-015	298	431	359	1784	2765	2304	171	289	241
CM11-016	300	451	376	1791	2794	2328	175	276	230
CM11-017	303	438	365	1785	2837	2364	174	301	251
CM11-018	307	445	371	1797	2722	2268	176	297	247
CM11-019	303	448	373	1799	2779	2316	173	300	250
SM04-001	154	248	206	364	772	643	2.9	52	43
SM04-002	190	513	393	630	1256	1039	14	127	88
SM04-005A	196	367	306	534	1236	1030	12	106	88
SM06-023	265	314	262	567	691	576	7.7	23	19
SM06-028	302	351	293	733	778	648	13	24	20
SM08-001	233	374	312	519	763	636	8.1	25	21
SM08-002	239	353	294	527	778	648	6.5	24	20
SM08-003	233	331	276	525	720	600	6.7	24	20
SM08-004	225	323	269	533	819	683	11	25	21

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Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 07/30/2019

Analysis Date: 07/30/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM07-011	293	432	360	1906	2817	2347	183	281	234
CM07-012	292	422	352	1908	2794	2328	181	289	241
CM07-013	290	436	364	1932	2841	2368	183	287	239
CM07-014	292	422	352	1944	2772	2310	182	274	228
CM07-015	296	432	360	1929	2822	2352	184	284	236
CM07-016	309	441	367	1978	2831	2359	188	281	234
CM10-008	323	475	396	1852	2707	2256	174	265	221
CM10-009	320	468	390	1834	2693	2244	171	269	224
CM10-010	345	475	396	1941	2736	2280	182	275	229
CM10-011	326	481	401	1820	2808	2340	165	288	240
CM10-012	345	446	372	1861	2923	2436	172	327	272
CM10-013	347	481	401	1766	2779	2316	165	287	239
CM10-014	354	490	408	1791	2578	2148	168	251	209
CM10-015	331	504	420	1820	2491	2076	163	253	211
CM10-016	313	484	403	1850	2650	2208	159	253	211
CM10-017	324	475	396	1863	2664	2220	164	248	206
IJ013P	311	415	346	1285	2900	2417	101	278	232
PR008	338	484	403	1373	2866	2388	98	282	235
PR015	285	444	370	1104	2792	2327	79	268	223
SM03-001	204	374	312	664	1122	935	12	85	71
SM03-002	177	305	254	443	805	671	3.1	40	34
SM03-003	175	297	247	454	729	607	5.5	30	25
SM04-010A	291	354	295	703	1053	877	13	36	30
SM04-011A	284	554	462	693	1469	1224	11	139	115
SM06-023	263	314	262	564	691	576	7.7	23	19
SM06-028	299	351	293	727	778	648	13	24	20
SM07-015	141	200	167	325	495	413	3.6	24	20
SM07-016	139	199	166	328	451	376	3.5	24	20
SM07-017	171	209	174	390	539	449	3.7	30	25
SM07-018	139	217	181	333	513	427	2.9	23	19
SM07-019	142	212	176	350	599	499	3.6	38	31
SM07-020	146	228	190	338	583	486	1.9	28	23



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Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 08/06/2019

Analysis Date: 08/06/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM06-009	298	428	356	1939	2866	2388	179	285	238
CM06-010	293	429	358	1947	2952	2460	177	327	272
CM08-001	291	455	379	1949	3110	2592	177	372	310
CM08-002	299	395	329	1925	3125	2604	180	334	278
CM08-003	317	432	360	2006	3211	2676	188	367	306
CM08-004	296	428	356	1923	3125	2604	180	328	274
CM08-005	289	425	354	1908	3067	2556	180	328	274
CM08-006	301	432	360	1924	3067	2556	180	317	264
CM08-007	311	425	354	1923	3154	2628	181	396	330
CM08-008	318	418	348	1937	3211	2676	183	415	346
CM08-009	314	452	377	1882	3053	2544	174	325	271
CM09-008	300	418	348	1811	2952	2460	175	366	305
CM09-009	306	475	396	1800	2923	2436	179	334	278
CM09-010	302	359	299	1782	2390	1992	179	292	244
CM09-011	304	445	371	1805	2707	2256	179	284	236
CM11-012	300	433	361	1806	2794	2328	175	268	223
CM11-013	301	418	348	1798	2722	2268	178	291	242
CM11-014	303	468	390	1777	3024	2520	173	357	298
CM11-015	297	431	359	1780	2765	2304	176	289	241
CM11-016	290	451	376	1793	2794	2328	187	276	230
CM11-017	303	438	365	1783	2837	2364	174	301	251
CM11-018	305	445	371	1785	2722	2268	179	297	247
CM11-019	301	448	373	1786	2779	2316	176	300	250
SM04-001	158	248	206	370	772	643	3.4	52	43
SM04-002	189	513	393	632	1256	1039	14	127	88
SM04-005A	193	367	306	540	1236	1030	12	106	88
SM06-023	262	314	262	559	691	576	7.5	23	19
SM06-028	296	351	293	725	778	648	13	24	20
SM08-001	233	374	312	520	763	636	7.8	25	21
SM08-002	238	353	294	528	778	648	6.5	24	20
SM08-003	231	331	276	526	720	600	7.9	24	20
SM08-004	223	323	269	535	819	683	11	25	21

WN



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 08/13/2019

Analysis Date: 08/13/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM07-011	294	432	360	1906	2817	2347	185	281	234
CM07-012	292	422	352	1917	2794	2328	183	289	241
CM07-013	291	436	364	1934	2841	2368	181	287	239
CM07-014	291	422	352	1954	2772	2310	181	274	228
CM07-015	299	432	360	1950	2822	2352	184	284	236
CM07-016	306	441	367	1985	2831	2359	187	281	234
CM10-008	323	475	396	1872	2707	2256	177	265	221
CM10-009	323	468	390	1839	2693	2244	174	269	224
CM10-010	342	475	396	1963	2736	2280	185	275	229
CM10-011	325	481	401	1822	2808	2340	167	288	240
CM10-012	345	446	372	1873	2923	2436	175	327	272
CM10-013	345	481	401	1759	2779	2316	166	287	239
CM10-014	356	490	408	1797	2578	2148	169	251	209
CM10-015	330	504	420	1814	2491	2076	163	253	211
CM10-016	311	484	403	1853	2650	2208	161	253	211
CM10-017	326	475	396	1860	2664	2220	163	248	206
IJ013P	308	415	346	1275	2900	2417	99	278	232
PR008	339	484	403	1367	2866	2388	98	282	235
PR015	282	444	370	1090	2792	2327	78	268	223
SM03-001	207	374	312	669	1122	935	13	85	71
SM03-002	179	305	254	446	805	671	3.8	40	34
SM03-003	177	297	247	455	729	607	5.6	30	25
SM04-010A	295	354	295	711	1053	877	12	36	30
SM04-011A	288	554	462	698	1469	1224	11	139	115
SM06-023	264	314	262	560	691	576	8.3	23	19
SM06-028	301	351	293	723	778	648	13	24	20
SM07-015	142	200	167	325	495	413	3.5	24	20
SM07-016	140	199	166	328	451	376	3.2	24	20
SM07-017	183	209	174	414	539	449	4.2	30	25
SM07-018	140	217	181	334	513	427	2.6	23	19
SM07-019	143	212	176	349	599	499	4.1	38	31
SM07-020	148	228	190	342	583	486	2.2	28	23

AW



Crow Butte Project

Monitor Well Laboratory Report

Sample Date: 08/20/2019

Analysis Date: 08/20/2019

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM06-009	294	428	356	1919	2866	2388	179	285	238
CM06-010	294	429	358	1948	2952	2460	179	327	272
CM08-001	291	455	379	1949	3110	2592	179	372	310
CM08-002	299	395	329	1924	3125	2604	181	334	278
CM08-003	315	432	360	1991	3211	2676	192	367	306
CM08-004	296	428	356	1924	3125	2604	180	328	274
CM08-005	286	425	354	1906	3067	2556	179	328	274
CM08-006	300	432	360	1922	3067	2556	181	317	264
CM08-007	313	425	354	1929	3154	2628	183	396	330
CM08-008	320	418	348	1956	3211	2676	187	415	346
CM08-009	315	452	377	1884	3053	2544	174	325	271
CM09-008	297	418	348	1810	2952	2460	178	366	305
CM09-009	304	475	396	1797	2923	2436	177	334	278
CM09-010	304	359	299	1784	2390	1992	176	292	244
CM09-011	300	445	371	1804	2707	2256	176	284	236
CM11-012	294	433	361	1801	2794	2328	170	268	223
CM11-013	300	418	348	1794	2722	2268	174	291	242
CM11-014	302	468	390	1787	3024	2520	173	357	298
CM11-015	296	431	359	1784	2765	2304	171	289	241
CM11-016	300	451	376	1786	2794	2328	178	276	230
CM11-017	303	438	365	1784	2837	2364	172	301	251
CM11-018	306	445	371	1794	2722	2268	175	297	247
CM11-019	300	448	373	1799	2779	2316	175	300	250
SM04-001	157	248	206	366	772	643	2.7	52	43
SM04-002	192	513	393	638	1256	1039	14	127	88
SM04-005A	196	367	306	536	1236	1030	12	106	88
SM06-023	262	314	262	562	691	576	7.6	23	19
SM06-028	299	351	293	726	778	648	13	24	20
SM08-001	238	374	312	524	763	636	8.7	25	21
SM08-002	242	353	294	530	778	648	6.8	24	20
SM08-003	232	331	276	522	720	600	7.7	24	20
SM08-004	226	323	269	538	819	683	11	25	21

SM06-023



