

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

July 14, 2020

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

Subject: Quarterly Excursion Monitoring Report
Source Materials License No. SUA-1534, Docket No. 40-8943

Dear Sir or Madam:

Enclosed please find one copy of the Excursion Monitoring Report for the Crow Butte Uranium Project. The report is provided in accordance with License Condition 11.1(A) of Source Materials License SUA-1534. This report covers the second quarter of 2020.

If you have any questions concerning the report, please feel free to call me at (308) 665-2215 ext. 117.

Sincerely,
CAMECO RESOURCES
CROW BUTTE OPERATION

Walter D. Nelson
SHEQ Coordinator

cc: Deputy Director, Division of Decommissioning
Uranium Recovery and Waste Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop T5A10
11545 Rockville Pike
Two White Flint North
Rockville, MD 20852-2738

CBO – File

cc: CR – Electronic File

NM5520

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

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

**CROW BUTTE URANIUM PROJECT
EXCURSION MONITORING
REPORT**

for

SECOND QUARTER, 2020

USNRC Source Materials License SUA 1534

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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

(308) 665-2215
(308) 665-2341 – FAX

Excursion Monitoring and Corrective Actions

On May 21, 2020, SM8-25 was placed on excursion status when the multiple parameter upper control limits (MCL) for conductivity and alkalinity were exceeded in a confirming sample. SM8-25 was placed on excursion last year following a major blizzard that impacted the area in March. Following the blizzard, conditions remained abnormally wet and cool throughout most of the summer. As a consequence, water levels remained relatively high throughout 2019, on into 2020. While the excursion parameters in the well did eventually retreat below the excursion criteria, they remained somewhat elevated above “normal” levels throughout this period. For example, the mean conductivity for the Q3 Excursion Monitoring Report in 2018 was 637 $\mu\text{Mho/cm}$, compared with 712 $\mu\text{Mho/cm}$ for the same period in 2019. Similarly, the alkalinity mean on the 2018 Q3 Excursion Monitoring Report was 256 ppm, compared with 262 ppm for the same period in 2019. Conditions this spring have not been exceptionally wet, but have been sufficient to have a slight impact on the excursion parameters in SM8-25. On June 17, 2020, the well was removed from excursion status after three consecutive weekly samples were below the excursion criteria. No corrective actions were taken beyond moving the well to a weekly sampling schedule.

On May 30, 2020, SM6-28 was placed on excursion status when the multiple parameter upper control limits (MCL) for conductivity and alkalinity were exceeded. As was the case with SM8-25, SM6-28 was placed on excursion last year following a major blizzard that impacted the area in March. Following the blizzard, conditions remained abnormally wet and cool throughout most of the summer. As a consequence, water levels remained relatively high throughout 2019, on into 2020. While the excursion parameters in the well did eventually retreat below the excursion criteria, they remained somewhat elevated above “normal” levels throughout this period. For example, the mean conductivity for the Q3 Excursion Monitoring Report in 2018 was 658 $\mu\text{Mho/cm}$, compared with 725 $\mu\text{Mho/cm}$ for the same period in 2019. Similarly, the alkalinity mean on the 2018 Q3 Excursion Monitoring Report was 280 ppm, compared with 301 ppm for the same period in 2019. Conditions this spring have not been exceptionally wet, but have been sufficient to have a slight impact on the excursion parameters in SM6-28. On June 17, 2020, the well was removed from excursion status after three consecutive weekly samples were below the excursion criteria. No corrective actions were taken beyond moving the well to a weekly sampling schedule.

A summary of the weekly excursion indicator parameters and laboratory reports for SM8-25 and SM6-28 are included in Appendix A and Appendix B respectively.

Appendix A
Summary of
Weekly Excursion Indicator Parameter Values
Second Quarter, 2020

Submitted by:
 Crow Butte Resources, Inc.
 P.O. Box 169
 Crawford, NE 69339

NRC
 Excursion Monitoring Report
 Quarter 2 of 2020

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

License No. SUA-153

Well ID	Alkalinity			Conductivity			Chloride		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
BOW96-001	225	230	227	509	531	521	7.4	8.3	7.9
CM02-005	320	327	322	1915	1939	1928	182	192	186.3
CM02-006	298	303	301	1464	1538	1507	122	134	128.4
CM02-007	289	299	293	1419	1505	1472	116	127	122.4
CM03-005	299	304	302	1940	1961	1953	183	191	185.7
CM03-006	300	303	302	1941	1961	1953	182	191	186.8
CM04-001	312	323	315	1853	1877	1863	177	180	178.4
CM04-002	308	312	310	1844	1867	1854	176	182	178.1
CM04-003	304	309	307	1845	1868	1855	174	178	175.7
CM04-004	299	306	302	1844	1864	1855	174	177	176.1
CM05-001	304	308	306	1722	1746	1735	155	163	158.7
CM05-002	304	309	306	1841	1867	1857	175	181	177.7
CM05-003	308	311	310	1844	1869	1856	178	181	179.2
CM05-004	308	314	310	1839	1864	1855	177	181	179
CM05-005	306	310	308	1846	1867	1855	176	179	177.5
CM05-006	305	312	308	1849	1871	1859	175	180	177.7
CM05-007	304	309	306	1848	1865	1855	174	179	177.5
CM05-008	308	311	309	1864	1889	1876	177	179	178
CM05-009	301	304	302	1854	1873	1863	172	178	175.8
CM05-010	285	295	290	1874	1898	1887	174	177	176.3
CM05-011	308	311	310	1906	1921	1913	176	180	178.3
CM05-012	299	303	301	1884	1908	1896	177	184	180.8
CM05-013	292	298	294	1864	1887	1879	173	180	177.3
CM05-018	300	304	302	1919	1934	1927	180	187	184
CM05-019	309	326	314	1812	1840	1827	164	171	168.5

CM05-020	330	337	333	1911	1940	1930	174	183	178.5
CM05-021	300	308	305	1913	1934	1926	181	187	183.5
CM05-022	298	305	302	1913	1933	1926	180	190	183.3
CM05-023	297	300	298	1908	1925	1915	178	183	180.2
CM05-024	299	305	301	1929	1946	1938	179	184	181.3
CM05-025	296	301	298	1932	1950	1941	171	175	173.2
CM05-026	296	303	301	1930	1953	1943	181	186	183.7
CM05-027	300	305	301	1933	1956	1946	181	187	183.5
CM06-001	296	300	298	1863	1889	1877	173	180	176.7
CM06-002	299	303	300	1905	1923	1915	176	182	179
CM06-003	297	304	299	1917	1932	1923	175	181	178.5
CM06-004	298	304	301	1914	1930	1923	176	181	178.8
CM06-005	292	293	293	1935	1950	1943	176	181	179.2
CM06-006	297	302	299	1927	1963	1940	174	180	178.3
CM06-007	281	282	281	1957	1975	1967	174	180	177.7
CM06-008	293	297	295	1926	1940	1934	175	179	177.7
CM06-009	288	296	292	1914	1932	1925	175	186	180.3
CM06-010	293	297	295	1921	1945	1936	177	183	180.2
CM06-012	299	303	302	1911	1941	1929	182	189	184.3
CM06-013	300	305	302	1920	1945	1934	183	186	184.7
CM06-014	295	299	297	1907	1927	1920	177	184	180.2
CM06-015	296	301	298	1922	1942	1934	178	184	181.2
CM06-016A	292	297	295	1923	1940	1934	176	179	178.3
CM06-017	305	307	306	1904	1928	1919	180	183	181.2
CM06-018	303	308	306	1901	1926	1913	178	183	180.2
CM06-019	311	315	312	1893	1917	1904	178	182	180.5
CM06-025	303	308	305	1882	1910	1897	178	190	182.1
CM06-026	303	308	306	1878	1899	1892	178	185	180.4
CM06-028	317	321	320	1820	1835	1832	172	179	175
CM06-029	316	321	319	1795	1832	1814	161	167	163.6
CM06-030	314	318	317	1830	1857	1846	171	178	175.3

CM06-031	317	323	320	1854	1876	1870	174	179	177.1
CM06-032	316	320	318	1869	1890	1883	176	182	178.6
CM07-010	298	301	300	1882	1902	1891	181	190	185
CM07-011	293	296	295	1896	1917	1909	183	186	184.1
CM07-012	294	296	295	1903	1919	1912	181	187	184.3
CM07-013	292	295	294	1922	1939	1930	180	184	182.9
CM07-014	294	297	295	1936	1957	1948	180	185	183.1
CM07-015	300	303	301	1937	1952	1945	182	186	184.3
CM07-016	303	307	305	1948	1966	1961	183	187	185.6
CM08-001	292	299	295	1914	1946	1930	174	181	177.8
CM08-002	285	307	299	1910	1946	1928	173	184	180.3
CM08-003	308	325	317	1970	2036	2001	185	195	189.2
CM08-004	295	300	298	1907	1934	1917	175	181	178.2
CM08-005	288	294	290	1885	1906	1896	178	181	179.8
CM08-006	296	305	301	1888	1923	1909	177	184	180.3
CM08-007	309	336	319	1904	2008	1949	184	192	186.2
CM08-008	330	338	334	1984	2011	1996	191	194	192.7
CM08-009	310	319	315	1847	1877	1861	173	179	175
CM08-010	314	320	317	1853	1869	1860	175	180	177.7
CM08-011	313	318	315	1839	1860	1849	170	177	173.7
CM08-012	320	325	323	1869	1893	1879	174	178	176.1
CM08-019	318	321	319	1825	1840	1833	166	171	170
CM08-020	318	321	320	1819	1833	1827	168	172	169.8
CM08-021	319	325	321	1825	1840	1832	166	171	169.2
CM08-022	322	326	324	1832	1845	1838	167	172	170.3
CM08-026	317	321	319	1826	1840	1833	167	171	169.3
CM08-027	318	321	319	1824	1840	1835	169	175	172.1
CM08-028	320	325	321	1823	1842	1837	168	176	172.9
CM09-008	296	299	298	1804	1829	1816	171	176	173.7
CM09-009	300	305	302	1778	1802	1792	172	179	174.7
CM09-010	300	303	302	1770	1790	1782	174	179	175.8

CM09-011	301	304	303	1789	1807	1799	177	179	178.3
CM09-012	302	305	303	1800	1816	1809	176	182	178.5
CM09-013	299	301	300	1809	1820	1815	177	180	178.2
CM09-014	302	307	304	1810	1837	1823	176	182	179.5
CM09-015	304	311	308	1825	1853	1838	177	185	180
CM09-016	302	308	304	1824	1844	1832	176	180	178.7
CM09-017	302	305	304	1827	1848	1837	177	183	179.8
CM09-018	301	302	302	1826	1851	1837	178	185	180.5
CM09-019	301	305	303	1838	1856	1849	178	186	181.5
CM09-020	295	299	297	1853	1874	1865	179	185	182.2
CM10-001	315	319	317	1850	1869	1858	170	175	172.4
CM10-002	315	318	317	1844	1864	1853	170	173	171.6
CM10-003	311	315	313	1837	1861	1852	170	177	173.3
CM10-004	342	350	347	1993	2031	2012	197	206	200.9
CM10-005	335	339	338	1978	2001	1990	194	201	197.6
CM10-006	316	318	317	1840	1857	1846	168	172	170.3
CM10-007	317	320	319	1836	1853	1841	166	171	168.4
CM10-008	322	329	325	1858	1867	1863	173	180	176.3
CM10-009	318	323	320	1823	1849	1839	166	172	169.4
CM10-010	331	337	334	1860	1878	1872	172	176	174.1
CM10-011	329	332	330	1797	1821	1808	164	170	166.9
CM10-012	345	353	348	1842	1886	1861	170	176	172.4
CM10-013	346	352	350	1734	1764	1749	163	167	164.9
CM10-014	350	368	356	1747	1849	1779	164	177	168.3
CM10-015	330	339	335	1803	1840	1825	160	168	164.1
CM10-016	312	316	314	1837	1862	1853	158	164	161.7
CM10-017	324	332	328	1851	1874	1865	161	168	165
CM10-020	328	354	340	1836	1940	1876	171	198	177.1
CM10-021	319	324	321	1821	1838	1832	160	170	164.9
CM10-022	324	330	326	1822	1840	1833	161	167	163.7
CM10-023	325	331	328	1831	1845	1838	162	168	164.7

CM10-024	323	326	324	1836	1850	1844	164	168	165.7
CM10-025	323	327	325	1828	1844	1837	165	171	168.1
CM10-026	321	326	323	1822	1837	1831	165	170	166.9
CM10-027	317	319	318	1832	1848	1839	166	172	169.7
CM10-028	317	324	320	1835	1850	1843	167	171	169.3
CM10-029	316	323	320	1801	1850	1836	165	171	168.5
CM10-030	321	325	323	1840	1854	1848	168	174	170.5
CM10-031	317	320	319	1830	1844	1839	166	172	169
CM10-032	317	320	318	1855	1872	1862	158	164	160.9
CM10-033	347	353	350	1784	1802	1790	162	167	163.7
CM10-034	353	366	358	1803	1880	1836	167	180	171
CM11-001	302	306	304	1846	1865	1859	176	183	179.6
CM11-002A	300	304	301	1842	1861	1854	176	181	178.9
CM11-003	300	307	304	1841	1874	1860	174	178	176.4
CM11-004	301	303	302	1831	1850	1842	174	179	176
CM11-005	300	303	302	1817	1834	1827	173	177	175.4
CM11-006	299	309	304	1817	1856	1834	173	179	175.4
CM11-007	297	301	299	1819	1839	1828	172	177	173.9
CM11-008	304	310	305	1838	1873	1861	172	178	175.1
CM11-009	297	301	298	1816	1836	1825	170	172	171
CM11-010	297	302	299	1801	1822	1815	171	180	173.7
CM11-011	313	419	361	1850	2291	2057	174	207	189.3
CM11-012	300	304	302	1797	1816	1808	171	174	172.3
CM11-013	302	305	304	1780	1804	1795	172	175	173.5
CM11-014	302	307	305	1780	1800	1793	172	174	173.2
CM11-015	298	300	299	1766	1790	1782	168	172	170.8
CM11-016	301	305	303	1765	1786	1778	171	174	172.7
CM11-017	301	307	305	1772	1788	1780	172	177	174.7
CM11-018	305	310	307	1775	1796	1789	173	181	175.5
CM11-019	303	305	304	1777	1799	1791	172	177	174.8
IJ013P	305	309	307	1229	1242	1235	90	93	91.4

PR008,	324	333	328	1380	1406	1393	103	107	104.9
PR015	269	274	271	1067	1084	1074	78	80	79.1
SM02-001	188	190	189	520	528	524	14	14	14
SM02-002	167	169	168	453	461	458	11	11	11
SM02-003	195	199	197	542	547	544	15	15	15
SM03-001	205	208	207	656	664	660	12	12	12
SM03-002	176	180	178	439	443	441	3.5	3.7	3.6
SM03-003	175	178	177	447	454	450	5	5.7	5.5
SM04-001	154	158	156	358	361	359	2.7	2.9	2.9
SM04-002	187	188	187	628	632	630	12	13	12.3
SM04-003	182	188	185	606	610	608	12	13	12.1
SM04-004	207	212	210	615	621	618	13	15	14
SM04-005A	195	198	197	527	533	531	11	12	11.5
SM04-006	270	274	272	649	656	653	12	14	13.2
SM04-007	166	181	174	495	501	498	17	20	17.9
SM04-008	287	290	289	679	691	684	11	12	11.7
SM04-009	262	271	267	633	644	639	13	18	14.1
SM04-010A	290	298	295	692	702	696	11	17	13.7
SM04-011A	288	290	289	685	695	691	11	11	11
SM05-001	231	234	233	590	597	593	12	12	12
SM05-002	191	194	192	445	451	447	5.1	5.4	5.2
SM05-003	224	227	225	576	582	580	12	12	12
SM05-004	208	211	209	549	556	552	15	16	15.5
SM05-005	233	237	235	588	596	591	11	11	11
SM05-006	207	213	211	563	569	566	12	13	12.2
SM05-007	210	213	212	558	570	563	9.7	10	9.9
SM05-008	206	209	208	545	555	550	12	13	12.2
SM05-009	204	209	206	539	546	542	11	12	11.2
SM05-010	207	210	209	540	552	546	10	10	10
SM05-011	214	217	216	560	573	566	10	10	10
SM05-012	203	210	207	537	555	547	9.8	10	10.0

SM05-013	198	203	200	538	547	542	12	12	12
SM05-014	180	183	182	476	486	481	8.6	8.9	8.8
SM05-015	202	205	203	535	545	540	12	12	12
SM05-016	181	184	183	439	449	445	5	5.5	5.3
SM05-017	165	168	167	407	412	410	1.5	2.6	2.1
SM05-018	168	173	171	416	422	420	2.7	3.1	2.9
SM05-019	182	185	183	468	475	472	4.3	4.6	4.5
SM05-020	177	182	180	478	486	482	4.9	5.4	5.1
SM05-021	176	179	178	446	453	451	4.5	4.9	4.7
SM05-022	182	184	183	458	463	460	3.6	4	3.7
SM05-023	180	183	182	454	460	457	3.4	3.6	3.5
SM05-024	170	172	171	426	434	431	4.8	5	5.0
SM05-025	169	173	171	451	456	454	5.9	6.4	6.2
SM06-001	208	213	210	527	532	531	6.8	7.6	7.2
SM06-002	206	210	207	536	542	540	10	11	10.3
SM06-003	202	205	203	532	539	535	9.6	11	10.0
SM06-004	205	214	210	516	535	526	8.1	9.1	8.6
SM06-005	211	214	212	506	513	510	6.6	7.1	6.8
SM06-006	223	226	224	471	475	473	3.2	3.5	3.4
SM06-007	223	226	225	491	495	493	6.7	7.2	6.9
SM06-008	206	208	207	495	501	498	9.3	9.5	9.4
SM06-009	220	225	222	481	492	485	6.3	7	6.6
SM06-010	203	210	205	486	509	493	8.2	9.1	8.6
SM06-011	215	218	217	533	544	538	14	14	14
SM06-012	231	237	233	522	532	526	9.5	9.7	9.6
SM06-013	244	247	245	521	535	526	6.3	6.8	6.6
SM06-014	204	208	206	537	549	543	12	12	12
SM06-015	204	209	206	521	534	527	9.8	11	10.3
SM06-016	208	211	209	441	449	446	4	4.4	4.2
SM06-017	234	237	235	480	484	482	3.8	4	3.9
SM06-018	200	204	201	542	557	550	14	17	15.7

SM06-019	207	212	209	496	504	500	11	11	11
SM06-020	213	216	215	539	546	541	13	14	13.2
SM06-021	221	225	223	552	562	556	14	14	14
SM06-022	207	211	209	471	479	475	7.8	8.4	8.1
SM06-023	253	267	260	542	569	556	8	8.4	8.2
SM06-024	244	256	248	548	574	556	8.2	9.1	8.5
SM06-025	220	223	222	552	573	564	13	14	13.9
SM06-026	205	208	206	470	476	475	8.3	8.6	8.4
SM06-027	234	245	240	516	536	528	7.9	8.5	8.2
SM06-028	287	297	291	660	685	670	10	11	10.9
SM07-001	176	198	182	439	518	455	4.2	7.4	4.9
SM07-002	164	171	167	398	404	402	3.2	3.4	3.3
SM07-003	169	174	172	423	432	428	3.7	4	3.9
SM07-004	164	169	166	393	397	396	3	3.3	3.1
SM07-005	167	172	169	419	425	422	3.9	4.6	4.1
SM07-006	155	159	157	358	366	363	2.8	2.9	2.9
SM07-007	167	174	171	424	430	427	4.3	4.6	4.4
SM07-008	167	172	168	462	469	466	7.9	8.5	8.1
SM07-009	168	174	170	414	420	418	4.2	4.6	4.4
SM07-010	166	173	169	427	433	431	3.7	3.9	3.8
SM07-011	143	148	144	338	343	341	3.1	3.3	3.1
SM07-012	166	173	169	434	446	438	3.2	3.5	3.4
SM07-013	151	157	153	363	366	364	4.1	4.6	4.3
SM07-014	135	142	137	329	335	332	3.6	4.2	4.0
SM07-015	141	145	143	321	328	323	2.8	3	2.9
SM07-016	138	141	139	323	329	325	3.1	3.4	3.2
SM07-017	177	179	178	400	409	404	4.1	4.5	4.2
SM07-018	137	140	139	328	335	330	2.5	2.9	2.8
SM07-019	142	144	143	344	350	346	3.5	3.8	3.6
SM07-020	146	148	147	334	340	336	1.8	2.1	2.0
SM07-021	143	146	144	335	340	337	2.6	2.7	2.7

SM07-022	146	149	148	334	341	338	2.4	2.6	2.6
SM07-023	177	181	178	455	462	459	4	4.5	4.2
SM07-024	186	190	188	576	578	577	7.8	8	7.9
SM07-025	155	158	157	356	362	358	3.4	3.6	3.5
SM08-001	235	239	238	510	515	513	7	7.4	7.2
SM08-002	239	243	242	515	521	518	5.6	6.2	6.0
SM08-003	229	234	232	508	523	513	7.7	9.1	8.0
SM08-004	225	227	226	526	528	527	10	11	10.7
SM08-005	253	256	255	575	580	578	9.4	10	9.7
SM08-006	251	257	254	591	597	594	11	11	11
SM08-007	252	259	255	586	589	588	9.9	10	10.0
SM08-008	241	245	242	509	517	514	6.1	6.4	6.3
SM08-009	239	243	241	510	516	514	6.5	6.8	6.6
SM08-010	250	254	251	570	576	573	9.4	9.8	9.7
SM08-011	235	240	238	543	548	545	8.7	9.1	8.9
SM08-012	244	250	247	564	578	570	9.2	11	9.7
SM08-013	231	235	233	541	546	543	10	11	10.8
SM08-014	240	244	242	554	561	558	8.9	9.9	9.6
SM08-015	229	230	230	541	549	545	8.6	8.9	8.7
SM08-016	235	239	237	575	584	580	8.9	9.1	9.0
SM08-017	244	249	246	576	580	578	9.2	9.6	9.4
SM08-018	237	243	240	565	570	567	10	11	10.8
SM08-019	240	246	243	559	568	564	9.1	9.3	9.2
SM08-020	229	232	230	559	564	562	8.3	9	8.8
SM08-021	234	239	236	570	582	574	8.9	10	9.3
SM08-022	253	261	257	638	658	649	9.7	10	10.0
SM08-023	228	233	231	546	558	556	8.2	8.9	8.7
SM08-024	234	237	235	565	575	570	9.3	9.5	9.4
SM08-025	261	275	269	668	697	688	12	12	12
SM08-026	231	236	234	532	565	545	9.2	9.5	9.3
SM08-027	237	245	241	517	532	528	7.4	9.5	7.8

SM08-028	257	282	273	575	648	615	8.2	8.7	8.4
SM08-029	275	282	277	687	699	693	13	13	13
SM08-030	207	216	211	468	492	478	9.1	9.5	9.2
SM08-031	235	238	236	509	516	513	6.3	6.7	6.5
SM09-001	168	174	170	410	428	415	3.7	4.3	3.9
SM09-002	161	164	162	376	383	378	3.1	3.8	3.3
SM09-003	161	164	163	378	386	382	3.4	3.8	3.6
SM09-004	147	151	149	358	364	361	3.8	4.1	3.9
SM09-005	142	146	144	310	319	316	2.7	3.2	2.9
SM09-006	138	141	140	296	300	298	1.5	2.1	1.8
SM09-007	161	164	163	391	393	392	3.1	3.5	3.3
SM09-008	161	164	162	386	389	388	2.6	2.8	2.7
SM09-009	150	154	152	361	364	362	3	3.2	3.1
SM09-010	144	147	146	339	342	341	2.9	3	2.9
SM09-011	147	150	148	347	353	349	2.4	2.6	2.6
SM09-012	160	163	162	384	389	386	2.6	2.7	2.7
SM09-013	142	145	144	330	333	331	3.2	3.4	3.3
SM09-014	139	142	140	312	316	314	1.3	2	1.6
SM09-015	139	141	140	312	315	313	1.6	2.3	1.9
SM09-016	140	143	141	295	298	297	1.2	1.9	1.5
SM09-017	140	142	141	314	317	316	2.8	3	2.9
SM09-018	143	144	143	315	319	317	1.4	1.9	1.7
SM09-019	135	137	136	303	307	305	2.8	3	2.9
SM09-020	139	141	140	304	308	306	1.6	2.3	2.0
SM10-001	313	321	316	720	731	724	14	14	14
SM10-002	233	237	235	539	543	541	8	8.7	8.5
SM10-003	249	253	250	554	557	556	7.9	8.4	8.2
SM10-004	241	245	242	531	535	533	7.1	7.3	7.2
SM10-005	242	246	244	528	534	531	6.8	7	6.9
SM10-006	311	338	325	704	750	730	12	13	12.7
SM10-007	308	317	313	707	714	712	14	14	14

SM10-008	278	321	295	642	753	688	12	18	14.7
SM10-009	249	254	252	560	570	565	9.2	9.5	9.4
SM10-010	238	242	240	532	542	536	8	8.2	8.1
SM10-011	257	273	268	601	629	621	10	11	10.9
SM10-012	271	276	273	628	634	631	11	11	11
SM10-013	237	242	239	541	554	545	9	9.5	9.1
SM10-014A	246	252	249	569	583	574	9.9	10	10.0
SM10-015	242	264	247	550	598	561	9.4	11	9.7
SM10-016	254	261	257	602	605	603	13	13	13
SM10-017	244	248	246	563	572	568	12	13	12.1
SM10-018	238	243	241	532	536	534	7.9	8.3	8.1
SM10-019	252	256	254	576	580	577	10	11	10.4
SM10-020	234	236	235	570	577	574	18	20	19.1
SM10-021	239	243	241	590	595	592	18	19	18.3
SM10-022	243	247	245	560	563	562	11	12	11.3
SM10-023	234	238	237	560	565	562	15	16	15.6
SM10-024	228	234	231	540	545	542	12	12	12
SM10-025	226	230	228	537	540	539	12	12	12
SM10-026	243	249	246	587	591	590	16	16	16
SM10-027	248	254	252	558	569	564	9.4	11	9.9
SM10-028A	221	232	227	581	596	588	26	27	26.4
SM10-029A	256	265	261	593	604	597	13	14	13.1
SM10-030	241	250	246	528	544	538	6.8	7.3	7.1
SM10-031	241	246	243	553	556	555	7.8	8.1	8.0
SM10-032	241	247	244	531	536	534	6.4	6.8	6.6
SM11-001	162	166	164	402	406	404	4.7	5.1	4.9
SM11-002	139	142	141	311	317	314	3	3.3	3.2
SM11-003	144	147	145	323	336	328	1.7	2.4	2.1
SM11-004	139	142	141	301	304	303	1.6	2.2	1.9
SM11-005	139	141	140	316	318	317	3.7	4.1	3.9
SM11-006	137	140	139	302	308	305	3.2	3.5	3.4

SM11-007	142	144	143	304	308	305	2.5	3	2.8
SM11-009	151	153	152	303	307	305	1	1.4	1.1
SM11-010	154	158	157	314	319	316	1.6	2.3	1.9
SM11-011	144	146	145	342	345	343	3.1	3.7	3.3
SM11-012	144	146	145	323	327	324	2.6	2.9	2.8
SM11-013	142	143	142	291	294	293	1.1	1.7	1.5
SM11-014	137	139	137	288	291	289	1.4	2	1.7
SM11-015	137	139	138	301	305	303	1.9	2.4	2.1
SM11-016	143	146	144	299	302	301	2.5	2.8	2.7
SM11-017	141	144	142	288	293	291	2.5	2.8	2.6
SM11-018	139	143	140	299	303	301	3.7	4	3.9
SM11-019	140	143	141	306	311	309	1.3	1.7	1.6
SM11-020	161	163	162	397	405	402	5.6	6	5.7
SM11-022	165	169	167	448	457	454	6.9	7.3	7.2
SM11-023	166	168	167	389	395	393	3.8	4	3.9
SM11-024	155	158	156	394	401	398	4.2	4.7	4.4
SM11-025	160	162	161	403	408	406	3	3.2	3.1
SM11-026	148	150	149	340	348	344	2.4	2.8	2.7

Appendix B

Monitor Well Laboratory Reports

Second Quarter, 2020



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 06/03/2020

Analysis Date: 06/03/2020

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM05-007	212	323	269	558	932	776	9.7	41	34
SM05-008	209	312	260	545	840	700	13	32	27
SM06-028	292	351	293	671	778	648	11	24	20
SM08-017	249	331	276	577	848	707	9.5	24	20
SM08-018	243	317	264	566	816	680	11	25	21
SM08-019	244	340	283	559	827	689	9.2	25	21
SM08-020	232	314	262	559	806	672	9	25	21
SM08-021	237	317	264	573	706	588	10	25	21
SM08-022	261	324	270	655	829	691	10	25	20
SM08-023	233	317	264	556	808	673	8.8	27	23
SM08-024	237	317	264	569	720	600	9.5	24	20
SM08-025	261	324	270	668	720	600	12	24	20
SM10-030	248	359	299	540	778	648	7.1	25	21
SM10-031	245	340	283	553	734	612	8	25	21
SM10-032	245	340	283	531	734	612	6.6	23	20



420

Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 06/10/2020

Analysis Date: 06/10/2020

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM08-010	320	441	367	1869	3038	2532	179	315	263
CM08-011	313	446	372	1843	3053	2544	176	325	271
CM08-012	325	461	384	1882	3038	2532	178	305	254
CM10-001	319	469	391	1861	2822	2352	175	305	254
CM10-002	318	474	395	1846	2707	2256	173	262	218
CM10-003	314	474	395	1849	2736	2280	177	266	222
CM10-004	349	468	390	2015	2794	2328	205	288	240
CM10-005	335	464	386	1978	3082	2568	199	389	324
CM10-006	317	482	402	1842	2750	2292	171	281	234
CM10-007	319	482	402	1842	2765	2304	169	278	232
CM11-001	303	438	365	1864	2808	2340	183	297	247
CM11-002A	303	442	368	1860	2794	2328	181	285	238
CM11-003	306	439	366	1874	2693	2244	178	272	227
CM11-004	302	464	386	1848	2678	2232	179	268	223
CM11-005	302	451	376	1834	2664	2220	177	274	228
CM11-006	309	436	364	1856	2707	2256	179	269	224
CM11-007	301	432	360	1834	2707	2256	175	272	227
CM11-008	306	462	385	1873	2678	2232	178	274	228
CM11-009	298	439	366	1836	2765	2304	172	276	230
CM11-010	300	436	364	1822	2707	2256	174	284	236
CM11-011	316	433	361	1876	2736	2280	177	278	232
SM04-003	186	361	301	610	1251	1043	12	38	32
SM04-004	211	266	222	621	1099	916	15	62	52
SM06-028	288	351	293	660	778	648	11	24	20
SM08-025	270	324	270	685	720	600	12	24	20
SM10-001	319	469	391	727	994	828	14	37	31
SM10-002	237	338	282	543	763	636	8.7	24	20
SM10-003	251	386	322	556	821	684	8.3	24	20
SM10-004	245	346	288	533	778	648	7.2	24	20
SM10-005	245	350	292	532	763	636	6.9	23	19
SM10-006	336	501	418	742	1123	936	13	33	28
SM10-007	317	403	336	714	965	804	14	33	27



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 06/17/2020

Analysis Date: 06/17/2020

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM05-007	213	323	269	562	932	776	10	41	34
SM05-008	209	312	260	549	840	700	12	32	27
SM06-028	289	351	293	666	778	648	11	24	20
SM08-017	249	331	276	580	848	707	9.5	24	20
SM08-018	243	317	264	568	816	680	11	25	21
SM08-019	246	340	283	562	827	689	9.1	25	21
SM08-020	231	314	262	561	806	672	8.3	25	21
SM08-021	237	317	264	572	706	588	9.2	25	21
SM08-022	260	324	270	658	829	691	10	25	20
SM08-023	233	317	264	558	808	673	8.8	27	23
SM08-024	236	317	264	565	720	600	9.3	24	20
SM08-025	270	324	270	693	720	600	12	24	20
SM10-030	250	359	299	544	778	648	6.8	25	21
SM10-031	246	340	283	554	734	612	7.8	25	21
SM10-032	247	340	283	536	734	612	6.4	23	20

WJ



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 06/24/2020

Analysis Date: 06/24/2020

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM08-010	318	441	367	1866	3038	2532	180	315	263
CM08-011	313	446	372	1839	3053	2544	175	325	271
CM08-012	325	461	384	1872	3038	2532	176	305	254
CM10-001	319	469	391	1854	2822	2352	174	305	254
CM10-002	315	474	395	1844	2707	2256	171	262	218
CM10-003	314	474	395	1853	2736	2280	175	266	222
CM10-004	350	468	390	2031	2794	2328	206	288	240
CM10-005	338	464	386	2001	3082	2568	201	389	324
CM10-006	316	482	402	1841	2750	2292	171	281	234
CM10-007	317	482	402	1840	2765	2304	171	278	232
CM11-001	302	438	365	1852	2808	2340	176	297	247
CM11-002A	300	442	368	1852	2794	2328	179	285	238
CM11-003	307	439	366	1863	2693	2244	178	272	227
CM11-004	301	464	386	1831	2678	2232	176	268	223
CM11-005	303	451	376	1824	2664	2220	177	274	228
CM11-006	308	436	364	1850	2707	2256	176	269	224
CM11-007	300	432	360	1825	2707	2256	174	272	227
CM11-008	304	462	385	1851	2678	2232	176	274	228
CM11-009	298	439	366	1820	2765	2304	171	276	230
CM11-010	298	436	364	1807	2707	2256	172	284	236
CM11-011	313	433	361	1850	2736	2280	174	278	232
SM04-003	188	361	301	610	1251	1043	13	38	32
SM04-004	212	266	222	620	1099	916	15	62	52
SM06-028	291	351	293	664	778	648	11	24	20
SM08-025	270	324	270	692	720	600	12	24	20
SM10-001	321	469	391	731	994	828	14	37	31
SM10-002	236	338	282	541	763	636	8.7	24	20
SM10-003	253	386	322	557	821	684	8.4	24	20
SM10-004	243	346	288	535	778	648	7.2	24	20
SM10-005	246	350	292	534	763	636	6.9	23	19
SM10-006	333	501	418	744	1123	936	13	33	28
SM10-007	315	403	336	712	965	804	14	33	27



Crow Butte Project
Monitor Well Laboratory Report

Sample Date: 07/01/2020

Analysis Date: 07/01/2020

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
SM05-007	213	323	269	563	932	776	9.9	41	34
SM05-008	208	312	260	546	840	700	13	32	27
SM06-028	288	351	293	663	778	648	11	24	20
SM08-017	249	331	276	582	848	707	9.6	24	20
SM08-018	241	317	264	567	816	680	11	25	21
SM08-019	244	340	283	558	827	689	9	25	21
SM08-020	233	314	262	565	806	672	9.1	25	21
SM08-021	236	317	264	569	706	588	9.3	25	21
SM08-022	259	324	270	653	829	691	11	25	20
SM08-023	235	317	264	557	808	673	8.9	27	23
SM08-024	234	317	264	558	720	600	9.6	24	20
SM08-025	268	324	270	687	720	600	12	24	20
SM10-030	249	359	299	543	778	648	7.2	25	21
SM10-031	246	340	283	551	734	612	7.8	25	21
SM10-032	246	340	283	535	734	612	6.4	23	20

WV



Sample Date: 07/08/2020

Analysis Date: 07/08/2020

Crow Butte Project Monitor Well Laboratory Report

Well ID	Alkalinity (mg/L)	Alk SCL	Alk MCL	Conductivity (µMho/cm)	Cond SCL	Cond MCL	Chloride (mg/L)	Cl SCL	Cl MCL
CM08-010	320	441	367	1861	3038	2532	182	315	263
CM08-011	316	446	372	1856	3053	2544	179	325	271
CM08-012	329	461	384	1894	3038	2532	180	305	254
CM10-001	322	469	391	1872	2822	2352	180	305	254
CM10-002	319	474	395	1857	2707	2256	175	262	218
CM10-003	316	474	395	1862	2736	2280	177	266	222
CM10-004	349	468	390	2023	2794	2328	206	288	240
CM10-005	336	464	386	1979	3082	2568	200	389	324
CM10-006	317	482	402	1838	2750	2292	172	281	234
CM10-007	318	482	402	1836	2765	2304	170	278	232
CM11-001	303	438	365	1862	2808	2340	180	297	247
CM11-002A	302	442	368	1864	2794	2328	180	285	238
CM11-003	308	439	366	1879	2693	2244	180	272	227
CM11-004	302	464	386	1846	2678	2232	179	268	223
CM11-005	302	451	376	1834	2664	2220	179	274	228
CM11-006	312	436	364	1872	2707	2256	180	269	224
CM11-007	299	432	360	1831	2707	2256	175	272	227
CM11-008	307	462	385	1870	2678	2232	178	274	228
CM11-009	298	439	366	1829	2765	2304	172	276	230
CM11-010	300	436	364	1822	2707	2256	174	284	236
CM11-011	315	433	361	1861	2736	2280	177	278	232
SM04-003	187	361	301	606	1251	1043	13	38	32
SM04-004	214	266	222	619	1099	916	17	62	52
SM06-028	291	351	293	660	778	648	11	24	20
SM08-025	269	324	270	678	720	600	12	24	20
SM10-001	320	469	391	730	994	828	14	37	31
SM10-002	236	338	282	539	763	636	8.6	24	20
SM10-003	253	386	322	558	821	684	8.2	24	20
SM10-004	245	346	288	535	778	648	7.1	24	20
SM10-005	246	350	292	535	763	636	6.9	23	19
SM10-006	330	501	418	734	1123	936	13	33	28
SM10-007	317	403	336	715	965	804	14	33	27