

TABLE 1
GROUNDWATER ANALYTICAL RESULTS

MILLER SOUTH #1 SPREAD FIELD
COGCC REMEDIATION #7412
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.

Sample Location	Date Sampled	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Chloride (mg/L)	Bromide (mg/L)	Chloride/Bromide*	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
Background 01	9/12/2012	15.36	95.02	236	NA	NA	514	1,600
Background 02	9/12/2012	17.40	94.91	217	NA	NA	433	1,400
SB01	3/8/2012	3.30	NM	1,260	NA	NA	1,070	4,600
SB01R	9/11/2012	4.24	90.72	181	NA	NA	372	1,300
	1/8/2013	2.75	92.21	2,820	NA	NA	1,010	4,700
	4/1/2013	NM	NM		No Sample - Under water			
	7/12/2013	2.57	92.39	1,360	NA	NA	448	2,800
	10/31/2013	NM	NM		No Sample - Under water			
	11/5/2013	9.56	85.40	208	NA	NA	553	2,180
	3/31/2014	9.25	85.71	193	0.725	266	440	1,780
	9/22/2014	NM	NM		No Sample - Under water			
SB01R2	9/3/2015	5.62	90.28	325	2.09	156	801	2,740
	3/10/2016	4.41	91.49	259	2.26	115	1,960	3,540
	9/29/2016	5.27	90.63	308	1.15	268	459	1,660
	4/13/2017	5.46	90.44	275	1.05	262	476	1,760
	10/19/2017	6.15	89.75	248	NA	NA	NA	NA
	4/11/2018	5.40	90.50	267	NA	NA	NA	NA
SB02	3/8/2012	6.46	NM	220	NA	NA	584	1,700
SB02R	9/11/2012	8.03	91.30	214	NA	NA	300	1,100
	1/8/2013	6.72	92.61	241	NA	NA	366	830
	4/1/2013	7.18	92.15	241	NA	NA	378	880
	7/12/2013	6.49	92.84	196	NA	NA	365	900
	10/31/2013	5.60	93.73	203	NA	NA	392	980
	4/1/2014	6.25	93.08	192	0.741	259	425	1,380
	9/22/2014	NM	NM		No Sample - Under water			
					Removed from monitoring program per COGCC document #2314191			
SB03	3/8/2012	6.22	NM	348	NA	NA	1,070	3,100
SB03R	9/11/2012	7.50	90.33	278	NA	NA	646	2,300
	1/8/2013	5.90	91.93	252	NA	NA	741	1,500
	4/1/2013	6.15	91.68	223	NA	NA	611	1,400
	7/12/2013	6.45	91.38	202	NA	NA	463	1,300

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Sample Location	Date Sampled	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Chloride (mg/L)	Bromide (mg/L)	Chloride/Bromide*	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
SB03R	10/31/2013	6.14	91.69	348	NA	NA	1,310	2,500
	4/1/2014	6.30	91.53	275	1.37	201	1,030	2,930
	9/22/2014	NM	NM	No Sample - Under water				
Removed from monitoring program per COGCC document #2314191								
SB04	3/8/2012	7.08	NM	296	NA	NA	1,220	3,100
SB04R	9/11/2012	7.94	89.73	488	NA	NA	1,600	4,800
	1/8/2013	6.83	90.84	388	NA	NA	1,330	2,400
	4/1/2013	6.30	91.37	356	NA	NA	1,330	2,400
	7/12/2013	6.11	91.56	328	NA	NA	1,170	2,500
	10/31/2013	NM	NM	No Sample - Monitoring well damaged				
	11/5/2013	4.28	93.39	1,420	NA	NA	1,010	6,030
	3/31/2014	4.15	93.52	2,000	2.77	722	948	5,790
	9/22/2014	NM	NM	No Sample - Under water				
	3/27/2015	6.23	91.44	170	0.823	207	1,270	2,760
9/3/2015	NM	NM	Monitoring well destroyed by landowner grading activity					
SB04R2	4/13/2017	5.97	90.54	649	3.45	188	1,640	4,780
	10/19/2017	6.65	89.86	890	NA	NA	NA	NA
	4/11/2018	6.45	90.06	1,290	NA	NA	NA	NA
SB05	3/8/2012	7.94	NM	208	NA	NA	896	2,400
SB05R	9/11/2012	6.51	88.62	291	NA	NA	1,060	3,000
SB05R2	1/8/2013	4.65	NM	6,170	NA	NA	1,570	10,000
	4/1/2013	6.55	90.37	1,630	NA	NA	2,790	4,800
	7/12/2013	7.95	88.97	489	NA	NA	862	2,100
	10/31/2013	6.70	90.22	436	NA	NA	1,650	2,800
	3/31/2014	6.68	90.24	853	3.60	237	1,830	4,500
	9/22/2014	NM	NM	No Sample - Under water				
	3/27/2015	6.35	90.57	380	2.64	144	1,110	4,410
	9/3/2015	7.06	89.86	256	2.59	99	1,090	2,840
	3/10/2016	6.10	90.82	1,300	8.05	161	2,250	6,110
	9/29/2016	6.53	90.39	432	3.66	118	1,320	3,740
	4/13/2017	6.56	90.36	255	2.22	115	1,000	2,940
10/19/2017	6.80	90.12	281	NA	NA	NA	NA	
4/11/2018	6.73	90.19	298	NA	NA	NA	NA	
SB06	3/8/2012	7.82	NM	147	NA	NA	280	890
SB06R	9/11/2012	7.45	89.68	186	NA	NA	325	1,200

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Sample Location	Date Sampled	Depth to Water (feet btoc)	Relative Groundwater Elevation (feet)	Chloride (mg/L)	Bromide (mg/L)	Chloride/Bromide*	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
SB06R	1/8/2013	6.32	90.81	218	NA	NA	401	770
	4/1/2013	6.99	90.14	199	NA	NA	366	780
	7/12/2013	4.78	92.35	171	NA	NA	307	750
	10/31/2013	5.89	91.24	223	NA	NA	242	730
	4/1/2014	7.70	89.43	221	1.03	215	308	1,090
	9/22/2014	6.53	90.60	184	0.452	407	318	1,010
	3/27/2015	6.94	90.19	946	1.06	892	585	3,560
SB06R2	9/3/2015	4.12	92.40	274	0.705	389	388	1,650
	3/10/2016	3.82	92.70	199	0.939	212	318	1,150
	9/29/2016	4.21	92.31	252	1.16	217	340	1,330
	4/13/2017	5.17	91.35	307	1.55	198	431	1,570
	10/19/2017	5.48	91.04	221	NA	NA	NA	NA
	4/11/2018	5.47	91.05	243	NA	NA	NA	NA
	SB07	3/8/2012	6.93	NM	1,020	NA	NA	1,620
SB07R	9/11/2012	9.68	84.95	773	NA	NA	896	3,400
	1/8/2013	7.89	86.74	1,150	NA	NA	2,930	4,900
	4/1/2013	8.49	86.14	1,050	NA	NA	3,170	5,000
	7/12/2013	6.98	87.65	551	NA	NA	3,020	3,900
	10/31/2013	7.48	87.15	839	NA	NA	2,530	4,000
	4/1/2014	7.78	86.85	189	3.86	49	502	5,650
	9/22/2014	7.44	87.19	677	3.31	205	2,040	5,590
SB07R2	9/3/2015	6.03	90.38	816	3.40	240	950	3,670
	3/10/2016	5.50	90.91	556	3.60	154	2,020	4,440
	9/29/2016	5.85	90.56	158	0.859	184	203	724
	4/13/2017	6.18	90.23	456	2.30	198	586	2,300
	10/19/2017	6.92	89.49	167	NA	NA	NA	NA
	4/11/2018	6.60	89.81	544	NA	NA	NA	NA
	SB08	3/8/2012	9.73	NM	182	NA	NA	395
SB08R	9/11/2012	11.77	89.27	2,140	NA	NA	500	1,600
	1/8/2013	9.39	91.65	247	NA	NA	736	1,100
	4/1/2013	9.79	91.25	202	NA	NA	391	860
	7/12/2013	8.80	92.24	370	NA	NA	816	1,600
	10/31/2013	8.22	92.82	277	NA	NA	475	1,100
	4/1/2014	9.07	91.97	272	0.764	356	348	1,270
	9/22/2014	NM	NM					

No Sample - Monitoring well damaged

Removed from monitoring program per COGCC document #2314191

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SB09 (background)	3/8/2012	8.09	NM	270	NA	NA	573	2,000
SB10	3/9/2012	9.64	NM	157	NA	NA	414	1,100
	9/12/2012	10.39	89.90	146	NA	NA	203	1,000
	1/8/2013	8.42	91.87	195	NA	NA	356	970
	4/1/2013	8.97	91.32	202	NA	NA	642	1,100
	7/12/2013	8.67	91.62	168	NA	NA	308	780
	10/31/2013	8.20	92.09	196	NA	NA	212	760
	4/1/2014	9.13	91.16	219	0.496	442	267	960
	9/22/2014	7.85	92.44	144	0.365	395	236	834
Removed from monitoring program per COGCC document #2314191								
SB11	3/9/2012	8.58	NM	267	NA	NA	717	1,900
	9/12/2012	9.78	89.05	263	NA	NA	639	1,900
	1/8/2013	7.72	91.11	309	NA	NA	808	1,300
	4/1/2013	7.89	90.94	306	NA	NA	695	1,300
	7/12/2013	8.68	90.15	382	NA	NA	775	1,600
	10/31/2013	7.69	91.14	300	NA	NA	686	1,300
	3/31/2014	7.90	90.93	272	0.796	342	593	1,780
	9/22/2014	6.55	92.28	458	1.33	344	791	2,370
	3/27/2015	6.21	92.62	566	1.31	432	756	2,710
	9/3/2015	NM	NM		No sample - Unable to locate			
	3/10/2016	NM	NM		No sample - Unable to locate			
	9/29/2016	9.25	89.58	337	1.38	244	659	1,970
	4/13/2017	9.08	89.75	337	1.82	185	577	1,990
	10/19/2017	10.08	88.75	384	NA	NA	NA	NA
4/11/2018	9.52	89.31	390	NA	NA	NA	NA	
SB12	3/9/2012	6.16	NM	300	NA	NA	1,230	2,500
	9/12/2012	8.70	88.03	270	NA	NA	643	1,900
	1/8/2013	6.45	90.28	424	NA	NA	921	1,600
	4/1/2013	6.25	90.48	366	NA	NA	1,650	2,200
	4/4/2013	6.24	90.49	371	NA	NA	1,650	2,200
	7/12/2013	7.94	88.79	393	NA	NA	1,100	2,000
	10/31/2013	6.53	90.20	311	NA	NA	1,210	2,100

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SB12	3/31/2014	6.20	90.53	1,150	5.29	217	3,000	6,510
	9/22/2014	4.61	92.12	392	1.48	265	1,330	3,370
	3/27/2015	6.10	90.63	675	1.74	388	1,490	4,130
	9/3/2015	NM	NM	No sample - Unable to locate				
	3/10/2016	6.10	90.63	357	1.27	281	646	2,090
	9/29/2016	7.21	89.52	598	1.22	490	673	2,220
	4/13/2017	6.98	89.75	372	0.908	410	647	2,090
	10/19/2017	7.90	88.83	206	NA	NA	NA	NA
	4/11/2018	7.37	89.36	225	NA	NA	NA	NA
SB13	3/9/2012	5.61	NM	439	NA	NA	1,210	2,900
	9/12/2012	7.43	87.40	314	NA	NA	902	2,400
	1/8/2013	5.02	89.81	352	NA	NA	1,010	1,700
	4/1/2013	4.83	90.00	1,800	NA	NA	3,500	5,400
	7/12/2013	7.03	87.80	373	NA	NA	937	1,800
	10/31/2013	5.17	89.66	596	NA	NA	1,380	2,500
	3/31/2014	4.60	90.23	656	2.15	305	1,460	3,970
	9/22/2014	1.96	92.87	175	0.447	391	279	836
	Removed from monitoring program per COGCC document #2314191							
SB14	3/9/2012	6.15	NM	125	NA	NA	991	1,900
	9/12/2012	8.32	88.83	246	NA	NA	1,010	2,500
	1/8/2013	6.28	90.87	246	NA	NA	999	1,500
	4/1/2013	6.18	90.97	1,060	NA	NA	862	2,600
	7/12/2013	7.60	89.55	666	NA	NA	752	2,100
	10/31/2013	6.20	90.95	1,430	NA	NA	843	3,200
	3/31/2014	6.20	90.95	599	1.52	394	714	2,750
	9/22/2014	3.83	93.32	86.2	0.433	199	247	843
	3/27/2015	6.13	91.02	170	0.496	343	273	939
	9/3/2015	NM	NM	No sample - Unable to locate				
	3/10/2016	6.10	91.05	474	1.45	327	354	1,740
	9/29/2016	7.12	90.03	264	0.674	392	420	1,400
	4/13/2017	7.03	90.12	221	0.744	297	581	1,660
10/19/2017	7.78	89.37	196	NA	NA	NA	NA	
4/11/2018	7.30	89.85	215	NA	NA	NA	NA	
SB15	3/9/2012	10.97	NM	No Sample - Dry				
	9/12/2012	7.89	87.88	292	NA	NA	900	2,500

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SB15	1/8/2013	5.65	90.12	654	NA	NA	3,520	4,800
	4/1/2013	5.49	90.28	588	NA	NA	2,720	4,400
	7/12/2013	7.52	88.25	465	NA	NA	1,020	2,300
	10/31/2013	5.72	90.05	528	NA	NA	1,790	4,000
	4/1/2014	5.50	90.27	No sample - Insufficient water				
	9/22/2014	3.15	92.62	485	4.04	120	2,340	5,320
Removed from monitoring program per COGCC document #2314191								
SB16	3/9/2012	7.36	NM	297	NA	NA	730	2,200
	9/12/2012	9.15	88.52	194	NA	NA	597	2,000
	1/8/2013	7.60	90.07	264	NA	NA	734	1,500
	4/4/2013	7.58	90.09	305	NA	NA	720	1,600
	7/12/2013	9.12	88.55	251	NA	NA	654	1,600
	10/31/2013	7.66	90.01	253	NA	NA	582	1,400
	3/31/2014	7.62	90.05	238	1.03	231	644	2,070
	9/22/2014	6.85	90.82	280	1.25	224	680	2,140
Removed from monitoring program per COGCC document #2314191								
SB17	9/11/2012	5.55	90.14	237	NA	NA	584	2,100
	1/8/2013	4.33	91.36	262	NA	NA	621	1,400
	4/1/2013	4.29	91.40	253	NA	NA	635	1,500
	7/12/2013	5.24	90.45	281	NA	NA	986	2,100
	11/5/2013	4.33	91.36	250	NA	NA	873	2,510
	3/31/2014	4.45	91.24	262	1.19	220	903	2,480
	9/22/2014	NM	NM	No Sample - Under water				
Removed from monitoring program per COGCC document #2314191								
SB18	9/11/2012	7.75	90.85	290	NA	NA	920	3,000
	1/8/2013	6.50	92.10	313	NA	NA	866	1,800
	4/1/2013	6.73	91.87	284	NA	NA	772	1,800
	7/12/2013	7.11	91.49	265	NA	NA	714	2,000
	10/31/2013	6.27	92.33	330	NA	NA	699	1,900
	4/1/2014	6.95	91.65	282	0.979	288	623	2,260
	9/22/2014	NM	NM	No Sample - Under water				

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SB18	3/27/2015	6.68	91.92	256	0.935	274	747	2,650
	9/3/2015	NM	NM	Monitoring well destroyed by landowner grading activity				
SB18R	4/13/2017	6.20	91.51	372	2.46	151	1,340	3,760
	10/19/2017	7.25	90.46	406	NA	NA	NA	NA
	4/11/2018	7.15	90.56	397	NA	NA	NA	NA
SB19	9/11/2012	8.56	91.77	196	NA	NA	317	1,300
	1/8/2013	6.85	93.48	390	NA	NA	831	1,600
SB19R	4/1/2013	12.65	85.10	190	NA	NA	324	680
	7/12/2013	6.78	90.97	211	NA	NA	368	810
	10/31/2013	10.23	87.52	239	NA	NA	317	860
	4/1/2014	12.00	85.75	No sample - Insufficient water				
	9/22/2014	NM	NM	No sample - Monitoring well destroyed				
Removed from monitoring program per COGCC document #2314191								
SB20	9/11/2012	10.33	89.50	183	NA	NA	180	1,000
	1/8/2013	9.40	90.43	209	NA	NA	329	710
SB20R	4/1/2013	11.23	84.71	234	NA	NA	301	750
	7/12/2013	7.56	88.38	234	NA	NA	342	880
	10/31/2013	8.69	87.25	244	NA	NA	283	700
	4/1/2014	11.42	84.52	No sample - Insufficient water				
	9/22/2014	9.39	86.55	155	0.404	384	149	650
	3/27/2015	NM	NM	Monitoring well destroyed by landowner grading activity				
SB20R2	9/3/2015	7.19	88.91	89.5	0.359	249	466	927
	3/10/2016	7.23	88.87	169	0.677	250	176	804
	9/29/2016	8.00	88.10	207	0.602	344	315	1,090
	4/13/2017	8.26	87.84	203	0.506	401	226	1,080
	10/19/2017	8.55	87.55	No sample - Insufficient water				
	4/11/2018	8.88	87.22	No sample - Insufficient water				
SB21	9/11/2012	10.17	90.62	162	NA	NA	490	1,200
	1/8/2013	8.36	92.43	196	NA	NA	350	660
SB21R	4/1/2013	9.95	86.89	190	NA	NA	163	650
	7/12/2013	5.81	91.03	223	NA	NA	369	880
	10/31/2013	7.93	88.91	238	NA	NA	239	710
	4/1/2014	11.13	85.71	No sample - Insufficient water				
	9/22/2014	NM	NM	No sample - Monitoring well destroyed				
Removed from monitoring program per COGCC document #2314191								

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SB22	9/12/2012	11.14	87.53	355	NA	NA	815	2,200
	1/8/2013	9.14	89.53	378	NA	NA	884	1,400
	4/1/2013	9.06	89.61	337	NA	NA	815	1,500
	7/12/2013	10.08	88.59	359	NA	NA	808	1,700
	10/31/2013	9.42	89.25	416	NA	NA	897	1,700
	3/31/2014	8.90	89.77	380	1.22	311	874	2,330
	9/22/2014	NM	NM				No sample - Could not locate	
Removed from monitoring program per COGCC document #2314191								
SB23	9/12/2012	11.25	86.21	212	NA	NA	515	1,500
	1/8/2013	8.26	89.20	268	NA	NA	712	1,100
	4/1/2013	7.95	89.51	354	NA	NA	1,100	1,600
	7/12/2013	9.65	87.81	368	NA	NA	1,120	1,900
	10/31/2013	8.61	88.85	237	NA	NA	607	1,400
	3/31/2014	7.72	89.74	604	2.38	254	1,830	3,950
	9/22/2014	6.84	90.62	1,290	4.18	309	2,940	6,850
	3/27/2015	6.38	91.08	1,150	2.64	436	2,060	5,300
	9/3/2015	NM	NM				No sample - Unable to locate	
	3/10/2016	7.60	89.86	1,280	5.43	236	2,430	5,980
	9/29/2016	8.83	88.63	997	2.15	464	1,760	4,680
	4/13/2017	5.32	92.14	704	1.74	405	1,380	3,890
	10/19/2017	9.21	88.25	664	NA	NA	NA	NA
4/11/2018	8.60	88.86	375	NA	NA	NA	NA	
COGCC Table 910-1 Standard				295	--	250*	642.5	2,000

NOTES:

btoc - below top of casing

COGCC - Colorado Oil and Gas Conservation Commission

mg/L - milligrams per liter

NA - not analyzed

NM - not measured

< - indicates result is less than the stated laboratory reporting limit

-- - indicates there is no standard

Chloride, sulfate, and total dissolved solids standards are calculated based on 1.25 times background concentrations

Chloride, bromide, and sulfate analyzed by EPA Method 300.0

Total dissolved solids analyzed by Standard Method 2540C and EPA Method 160.1

BOLD indicates result exceeds the applicable standard

* - This value is not a regulatory limit and is included for reference purposes only. Unimpacted groundwater would not be expected to exhibit a ratio of chloride to bromide that exceeds this naturally occurring value.

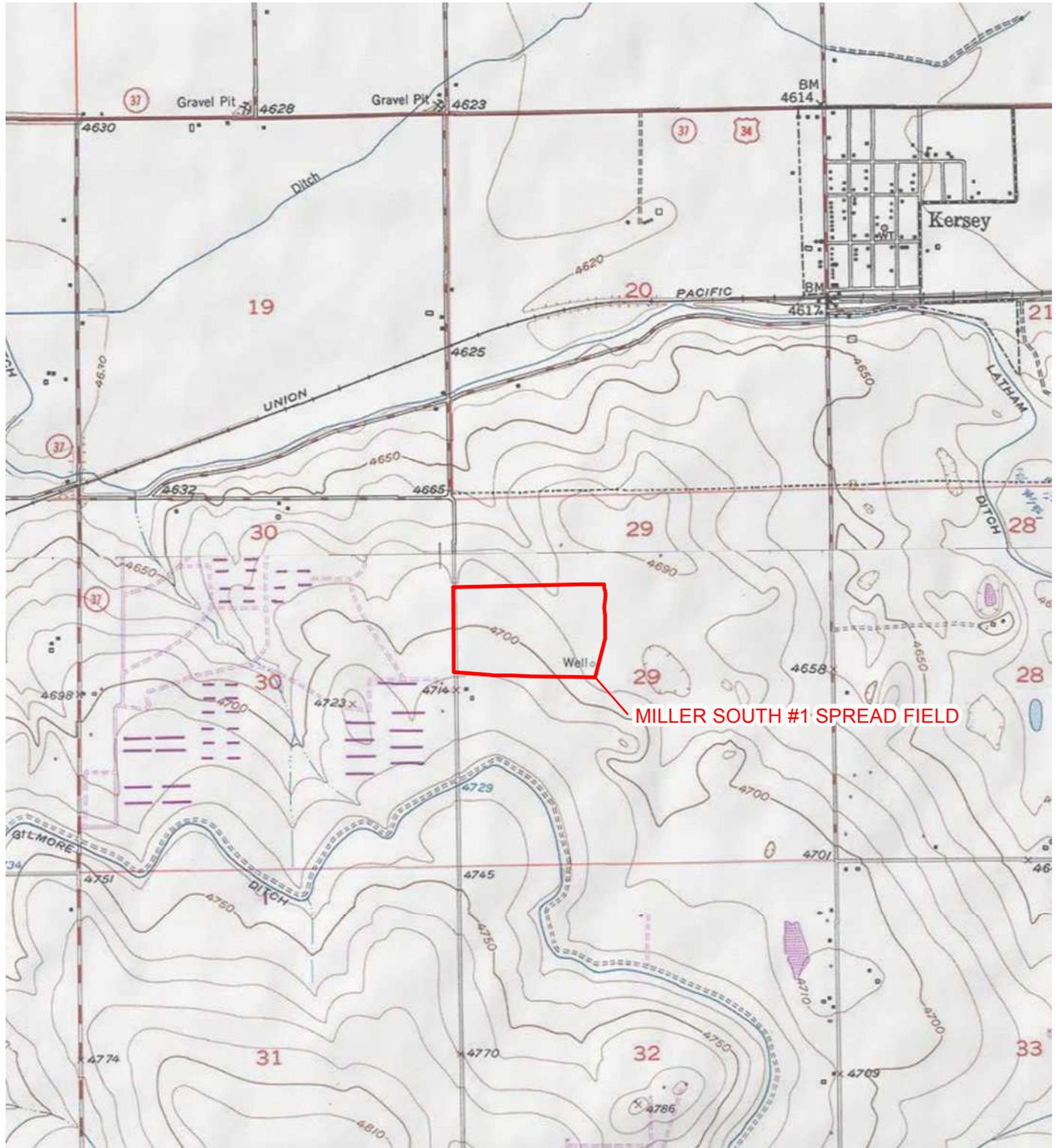


IMAGE COURTESY OF ESRI/USGS

LEGEND

 SITE LOCATION

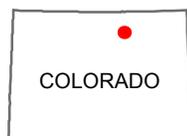
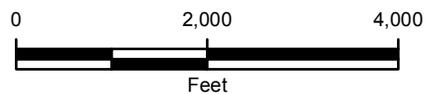


FIGURE 1
SITE LOCATION MAP
MILLER SOUTH #1 SPREAD FIELD
S/2NW Sec29 T5N R64W
WELD COUNTY, COLORADO
NOBLE ENERGY, INC.



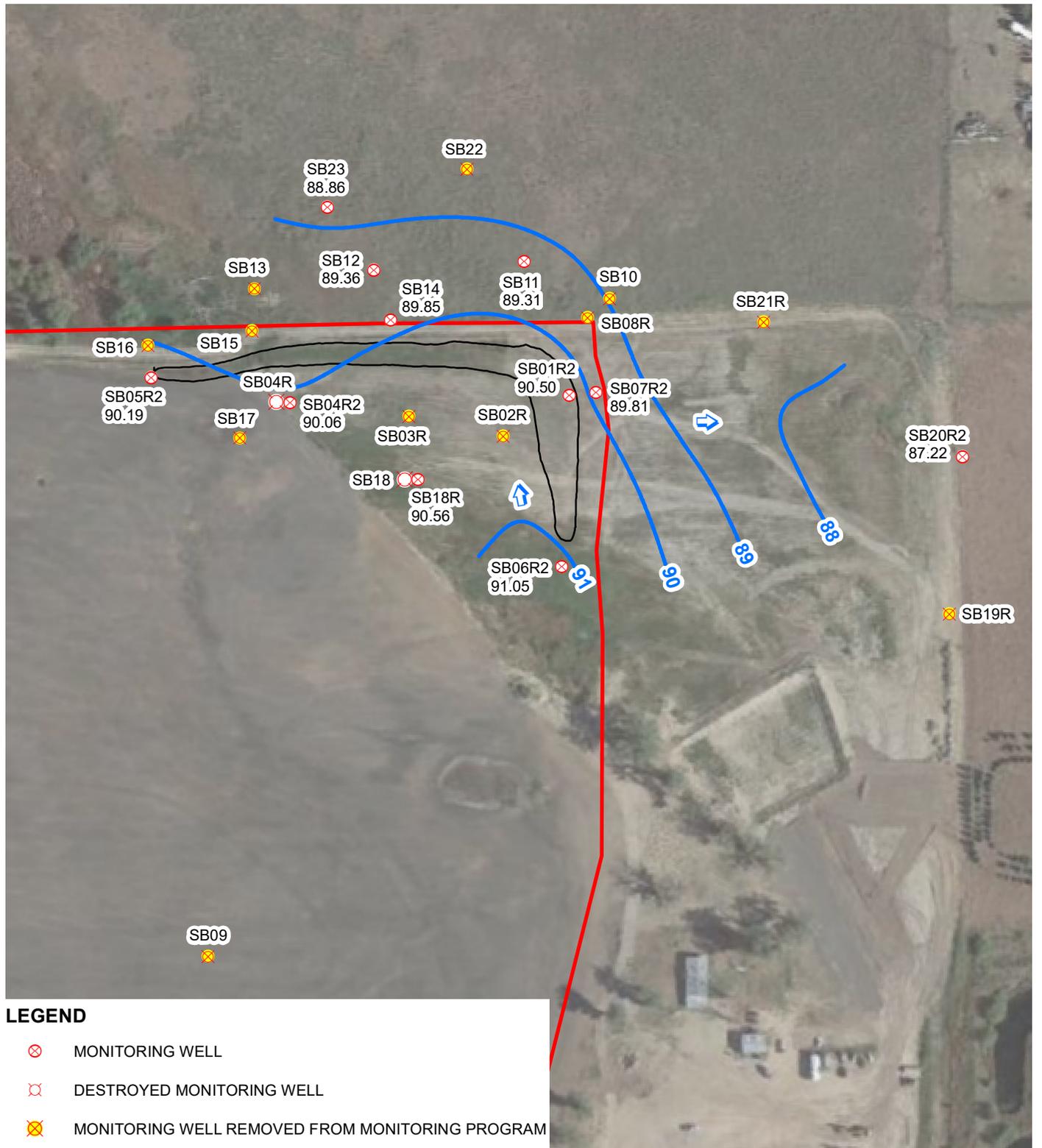


IMAGE COURTESY OF GOOGLE EARTH 2016

LEGEND

-  MONITORING WELL
-  DESTROYED MONITORING WELL
-  MONITORING WELL REMOVED FROM MONITORING PROGRAM
-  CALCULATED GROUNDWATER FLOW DIRECTION
-  HISTORICAL SPREAD FIELD BOUNDARY
-  SURFICIAL RELEASE EXTENT
-  RELATIVE GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 1 FOOT
- GRADIENT = 0.005 FEET/FOOT

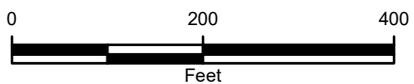
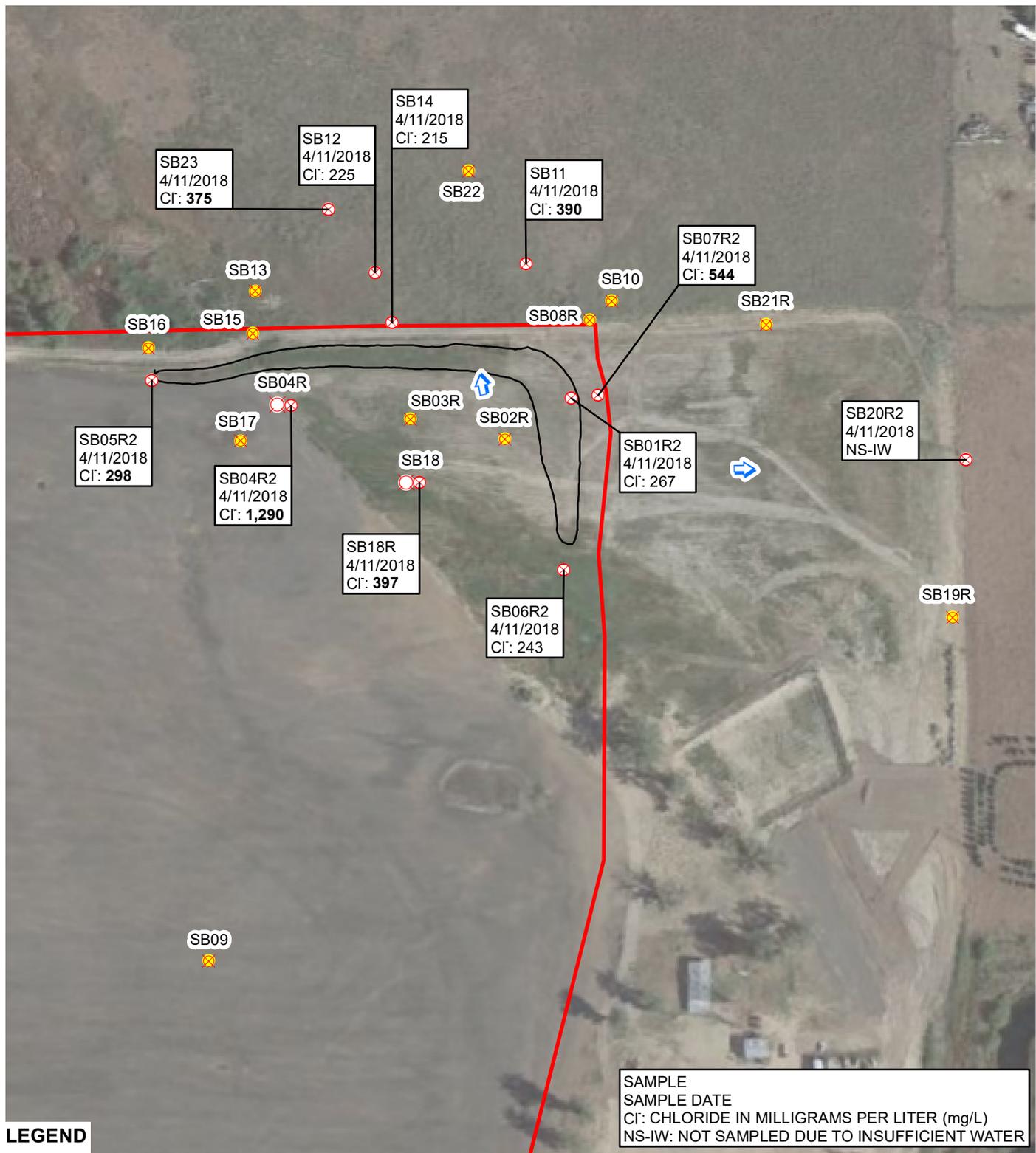


FIGURE 2
RELATIVE GROUNDWATER ELEVATION MAP
 APRIL 11, 2018
 MILLER SOUTH #1 SPREAD FIELD
 WELD COUNTY, COLORADO
 NOBLE ENERGY, INC.





LEGEND

- MONITORING WELL
- DESTROYED MONITORING WELL
- MONITORING WELL REMOVED FROM MONITORING PROGRAM
- CALCULATED GROUNDWATER FLOW DIRECTION
- HISTORICAL SPREAD FIELD BOUNDARY
- SURFICIAL RELEASE EXTENT

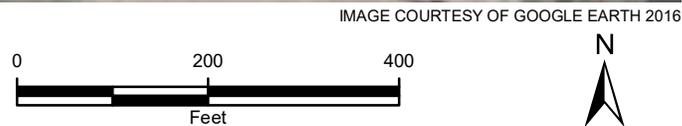


FIGURE 3
GROUNDWATER ANALYTICAL RESULTS
 APRIL 11, 2018
 MILLER SOUTH #1 SPREAD FIELD
 WELD COUNTY, COLORADO
NOBLE ENERGY, INC.





April 18, 2018

LT Environmental, Inc.

Jeremy Pike

4600 West 60th Avenue

Arvada

CO 80003

Project Name - Noble - Miller #1 South CACL

Project Number - [none]

Attached are your analytical results for Noble - Miller #1 South CACL received by Origins Laboratory, Inc. April 11, 2018. This project is associated with Origins project number Y804197-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB01R2	Y804197-01	Water	April 11, 2018 13:22	04/11/2018 14:40
SB04R2	Y804197-02	Water	April 11, 2018 12:37	04/11/2018 14:40
SB05R2	Y804197-03	Water	April 11, 2018 12:25	04/11/2018 14:40
SB06R2	Y804197-04	Water	April 11, 2018 13:33	04/11/2018 14:40
SB07R2	Y804197-05	Water	April 11, 2018 13:05	04/11/2018 14:40
SB11	Y804197-06	Water	April 11, 2018 11:20	04/11/2018 14:40
SB12	Y804197-07	Water	April 11, 2018 12:09	04/11/2018 14:40
SB14	Y804197-08	Water	April 11, 2018 11:53	04/11/2018 14:40
SB18	Y804197-09	Water	April 11, 2018 12:50	04/11/2018 14:40
SB23	Y804197-10	Water	April 11, 2018 11:40	04/11/2018 14:40

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Jeremy Pike
 Project Number: [none]
 Project: Noble - Miller #1 South CACL

www.originslaboratory.com

14604197

page 1 of 1

ORIGINS
 LABORATORY, INC

Client: LT Environmental, Inc. Project Manager: Jeremy Pike
 Address: 4600 West 60th Ave, Arvada, CO Project Name: Miller South #1 CaCl
 Telephone Number: 303-433-9788 Project Number: 008312061
 Email Address: Noble Remediation Team Samples Collected By: Glenn Thompson
 Invoice: Jacob Evans

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #		
SB0182	4/11/18	1322	1	X				X				Chloride, Bromide, Sulfate, Phos Lab filter all
SB0482	4/11/18	1237	1	X				X				
SB0582	4/11/18	1225	1	X				X				
SB0682	4/11/18	1333	1	X				X				
SB0782	4/11/18	1305	1	X				X				
SB11	4/11/18	1120	1	X				X				
SB12	4/11/18	1209	1	X				X				
SB14	4/11/18	1153	1	X				X				
SB15	4/11/18	1250	1	X				X				
SB23	4/11/18	1140	1	X				X				
Relinquished By:	Date: 4/11/18	Time: 1440	Time: 1440	Received By:	Date: 4/11/18	Time: 1440	Time: 1440	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>				

1725 EIK Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Date Results Needed

2.4

Origins Laboratory, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Jeremy Pike
 Project Number: [none]
 Project: Noble - Miller #1 South CACL

Origins Laboratory F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: Y804197 Client: LTE
 Client Project ID: Noble - Miller South #1 CACL

Checklist Completed by: JG Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Date/time completed: 4/11/2018 Airbill #: N/A

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
(Describe)

Cooler Number/Temperature: 1 / 2.4 °c _____ / _____ °c _____ / _____ °c _____ / _____ °c

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	/	-		
Is there ice present (document if blue ice is used)	/			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		/		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		/		
Were all samples received intact ⁽¹⁾ ?	/			
Was adequate sample volume provided ⁽¹⁾ ?	/			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		/		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	/			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	/			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	/			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	/			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		/		
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) / (pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)		/		
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.


 Reviewed by (Project Manager) 4/12/18
Date/Time Reviewed

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB01R2

4/11/2018 1:22:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-01 (Water)

Anions by EPA 300.0

Chloride	267	10.0	mg/L	50	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB04R2

4/11/2018 12:37:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-02 (Water)

Anions by EPA 300.0

Chloride	1290	40.0	mg/L	200	1755299	04/11/2018	04/13/2018	
----------	------	------	------	-----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB05R2

4/11/2018 12:25:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-03 (Water)

Anions by EPA 300.0

Chloride	298	10.0	mg/L	50	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB06R2

4/11/2018 1:33:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-04 (Water)

Anions by EPA 300.0

Chloride	243	10.0	mg/L	50	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB07R2

4/11/2018 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-05 (Water)

Anions by EPA 300.0

Chloride	544	20.0	mg/L	100	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	-----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB11

4/11/2018 11:20:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-06 (Water)

Anions by EPA 300.0

Chloride	390	10.0	mg/L	50	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Jeremy Pike
 Project Number: [none]
 Project: Noble - Miller #1 South CACL

SB12

4/11/2018 12:09:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-07 (Water)

Anions by EPA 300.0

Chloride	225	8.00	mg/L	40	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Jeremy Pike
 Project Number: [none]
 Project: Noble - Miller #1 South CACL

SB14

4/11/2018 11:53:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-08 (Water)

Anions by EPA 300.0

Chloride	215	5.00	mg/L	25	1755299	04/11/2018	04/13/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB18

4/11/2018 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-09 (Water)

Anions by EPA 300.0

Chloride	397	20.0	mg/L	100	1755299	04/11/2018	04/14/2018	
----------	-----	------	------	-----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

SB23

4/11/2018 11:40:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	-------

GEL Laboratories, LLC
Y804197-10 (Water)

Anions by EPA 300.0

Chloride	375	10.0	mg/L	50	1755299	04/11/2018	04/14/2018	
----------	-----	------	------	----	---------	------------	------------	--

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

Jeremy Pike
 Project Number: [none]
 Project: Noble - Miller #1 South CACL

Anions by EPA 300.0 - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1755299 -										
BLANK (1204007868-BLK)					Prepared: Analyzed: 04/12/2018					
Chloride	ND	0.200	mg/L				-			U
LCS (1204007869-BKS)					Prepared: Analyzed: 04/12/2018					
Chloride	4.77	0.200	mg/L	5.00		95.4	90-110			
DUP (1204007870 D)					Source: Y804197-01 Prepared: Analyzed: 04/13/2018					
Chloride	267	10.0	mg/L		267		0-20	0.088	20	
PS (1204007871 S)					Source: Y804197-01 Prepared: Analyzed: 04/13/2018					
Chloride	542	10.0	mg/L	5.00		110	90-110			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Jeremy Pike
Project Number: [none]
Project: Noble - Miller #1 South CACL

Notes and Definitions

U Result not detected above the detection limit

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



April 16, 2018

Ms. Noelle Doyle
Origins Laboratory, Inc
1725 Elk Place
Denver, Colorado 80211

Re: Origins Laboratory, Inc
Work Order: 447827
SDG: Y804197

Dear Ms. Doyle:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 12, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4289.

Sincerely,

B Luthman
Brielle Luthman for
Julie Robinson
Project Manager

Purchase Order: GELP13-0298
Chain of Custody: Y804197
Enclosures



Certificates of Analysis and QC Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-01

Project: OLAB00100

Sample ID: 447827001

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 13:22

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		267	3.35	10.0	mg/L		50	LXA2	04/13/18	1316	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-02

Project: OLAB00100

Sample ID: 447827002

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 12:37

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		1290	13.4	40.0	mg/L		200	LXA2	04/13/18	2015	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-03

Project: OLAB00100

Sample ID: 447827003

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 12:25

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		298	3.35	10.0	mg/L		50	LXA2	04/13/18	2045	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-04

Project: OLAB00100

Sample ID: 447827004

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 13:33

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		243	3.35	10.0	mg/L		50	LXA2	04/13/18	2115	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-05

Project: OLAB00100

Sample ID: 447827005

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 13:05

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		544	6.70	20.0	mg/L		100	LXA2	04/13/18	2145	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-06

Project: OLAB00100

Sample ID: 447827006

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 11:20

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		390	3.35	10.0	mg/L		50	LXA2	04/13/18	2215	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-07

Project: OLAB00100

Sample ID: 447827007

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 12:09

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		225	2.68	8.00	mg/L		40	LXA2	04/13/18	2245	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-08

Project: OLAB00100

Sample ID: 447827008

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 11:53

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		215	1.68	5.00	mg/L		25	LXA2	04/13/18	2315	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-09

Project: OLAB00100

Sample ID: 447827009

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 12:50

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		397	6.70	20.0	mg/L		100	LXA2	04/14/18	0044	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: April 16, 2018

Company : Origins Laboratory, Inc
Address : 1725 Elk Place

Denver, Colorado 80211

Contact: Ms. Noelle Doyle
Project: Origins Laboratory, Inc

Client Sample ID: Y804197-10

Project: OLAB00100

Sample ID: 447827010

Client ID: OLAB001

Matrix: Water

Collect Date: 11-APR-18 11:40

Receive Date: 12-APR-18

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Chloride in Liquid "As Received"												
Chloride		375	3.35	10.0	mg/L		50	LXA2	04/14/18	0114	1755299	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: April 16, 2018

Page 1 of 2

Origins Laboratory, Inc
1725 Elk Place
Denver, Colorado

Contact: Ms. Noelle Doyle

Workorder: 447827

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1755299										
QC1204007870	447827001	DUP									
Chloride		267		267	mg/L	0.088		(0%-20%)	LXA2	04/13/18	13:45
QC1204007869	LCS										
Chloride	5.00			4.77	mg/L		95.4	(90%-110%)		04/12/18	17:39
QC1204007868	MB										
Chloride			U	ND	mg/L					04/12/18	17:09
QC1204007871	447827001	PS									
Chloride	5.00	5.34		10.8	mg/L		110	(90%-110%)		04/13/18	19:45

Notes:

The Qualifiers in this report are defined as follows:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 447827

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
d		5-day BOD--The 2:1 depletion requirement was not met for this sample									
e		5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes									
h		Preparation or preservation holding time was exceeded									

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



Product: Ion Chromatography
Analytical Method: EPA 300.0
Analytical Procedure: GL-GC-E-086 REV# 25
Analytical Batch: 1755299

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
447827001	Y804197-01
447827002	Y804197-02
447827003	Y804197-03
447827004	Y804197-04
447827005	Y804197-05
447827006	Y804197-06
447827007	Y804197-07
447827008	Y804197-08
447827009	Y804197-09
447827010	Y804197-10
1204007868	Method Blank (MB)
1204007869	Laboratory Control Sample (LCS)
1204007870	447827001(Y804197-01) Sample Duplicate (DUP)
1204007871	447827001(Y804197-01) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Sample Dilutions

The following samples 1204007870 (Y804197-01DUP), 1204007871 (Y804197-01PS), 447827001 (Y804197-01), 447827002 (Y804197-02), 447827003 (Y804197-03), 447827004 (Y804197-04), 447827005 (Y804197-05), 447827006 (Y804197-06), 447827007 (Y804197-07), 447827008 (Y804197-08), 447827009 (Y804197-09) and 447827010 (Y804197-10) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	447827									
	001	002	003	004	005	006	007	008	009	010
Chloride	50X	200X	50X	50X	100X	50X	40X	25X	100X	50X

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.



Your Lab's letterhead here...

Address

City, St. Zip

Phone/Fax

447827

SUBCONTRACT ORDER

Sending Laboratory:

Origins Laboratory, Inc.
1725 West Elk Place
Denver, CO 80211
Phone: 303.433.1322
Fax: 303.265.9645

Project Manager: Noelle Doyle Mathis

Subcontracted Laboratory:

GEL
2040 Savage Road
Charleston, SC 29407
Phone: (843) 769-7386
Fax: -

Work Order: Y804197

Analysis	Due	Expires	Comments
Sample ID: Y804197-01 Water Sampled: 04/11/2018 13:22			
Chloride by 300.0	04/18/2018	04/13/2018 13:22	
<i>Containers Supplied:</i>			
Sample ID: Y804197-02 Water Sampled: 04/11/2018 12:37			
Chloride by 300.0	04/18/2018	04/13/2018 12:37	
<i>Containers Supplied:</i>			
Sample ID: Y804197-03 Water Sampled: 04/11/2018 12:25			
Chloride by 300.0	04/18/2018	04/13/2018 12:25	
<i>Containers Supplied:</i>			
Sample ID: Y804197-04 Water Sampled: 04/11/2018 13:33			
Chloride by 300.0	04/18/2018	04/13/2018 13:33	
<i>Containers Supplied:</i>			
Sample ID: Y804197-05 Water Sampled: 04/11/2018 13:05			
Chloride by 300.0	04/18/2018	04/13/2018 13:05	
<i>Containers Supplied:</i>			
Sample ID: Y804197-06 Water Sampled: 04/11/2018 11:20			
Chloride by 300.0	04/18/2018	04/13/2018 11:20	
<i>Containers Supplied:</i>			
Sample ID: Y804197-07 Water Sampled: 04/11/2018 12:09			
Chloride by 300.0	04/18/2018	04/13/2018 12:09	
<i>Containers Supplied:</i>			
Sample ID: Y804197-08 Water Sampled: 04/11/2018 11:53			

Released By

4/11/18
Date

Received By

4/12/18 8:55
Date



Your Lab's letterhead here...

Address

City, St. Zip

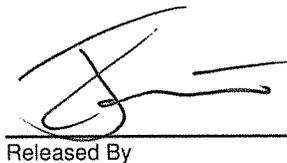
Phone/Fax

**SUBCONTRACT
ORDER**
(Continued)

Work Order: Y804197 (Continued)

Analysis	Due	Expires	Comments
Sample ID: Y804197-08 <i>Water</i> Sampled: 04/11/2018 11:53			
Chloride by 300.0	04/18/2018	04/13/2018	11:53
<i>Containers Supplied:</i>			
Sample ID: Y804197-09 <i>Water</i> Sampled: 04/11/2018 12:50			
Chloride by 300.0	04/18/2018	04/13/2018	12:50
<i>Containers Supplied:</i>			
Sample ID: Y804197-10 <i>Water</i> Sampled: 04/11/2018 11:40			
Chloride by 300.0	04/18/2018	04/13/2018	11:40
<i>Containers Supplied:</i>			

1x 500mL poly unpres. per Sample


Released By

4/11/18
Date


Received By

4/12/18 9:55
Date

List of current GEL Certifications as of 16 April 2018

State	Certification
Alaska	17-018
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122018-26
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404