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**UIC CLASS I  
QUARTERLY REPORT  
for the  
LOST CREEK ISR PROJECT  
4th Quarter 2017**



**LOST CREEK ISR, LLC  
SWEETWATER COUNTY, WY**

**UIC PERMIT 13-409**

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**Prepared by Ur-Energy for  
Wyoming Department of Environmental Quality -  
Water Quality Division – Underground Injection Control**

**January 30, 2018**



## Contents

1.0	Introduction.....	2
2.0	Summary Data .....	3
3.0	Analytical Results .....	7
4.0	Permit Exceedances.....	7
5.0	Alarms, Shut-Downs, and Corrective Actions.....	8
6.0	Summary of Well Tests or Workovers .....	8

## Tables

Table 1A: Operational Data Summary for DDW-1
Table 1B: Operational Data Summary for DDW-3
Table 1C: Operational Data Summary for DDW-4
Table 2: Cumulative Injection Volumes to Date
Table 3: Analytical Results Summary
Table 4: Summary of Exceedances
Table 5: Summary of Automatic Pressure Shutoff Testing

## Figures

Figure 1: Well Locations
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## Appendices

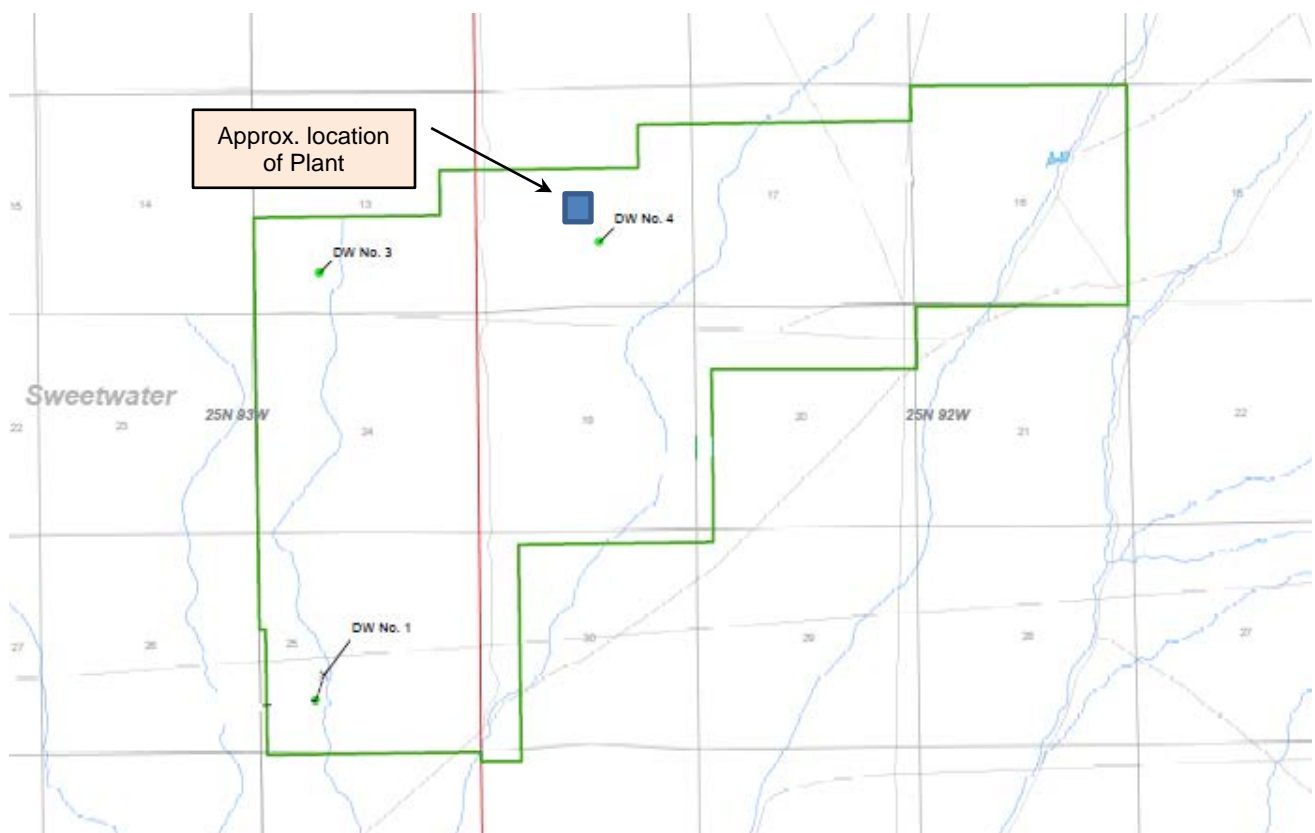
Appendix 1: Daily Injection Pressures
Appendix 2: Lab Report
Appendix 3: Annual Report Summaries and Data Disk
Appendix 3a: 5-Year Summary of Monthly Injection Pressures and Volumes
Appendix 3b: 5-Year Summary of Water Quality Data

## 1.0 Introduction

The period covered by this report is the fourth calendar quarter of 2017 from October 1 to December 31, 2017.

Three Class I disposal wells were operational during the reporting period: LC DW No. 1 (“DDW-1”), LC DW No. 3 (“DDW-3”), and LC DW No. 4 (“DDW-4”). Well locations (labeled) are shown below in relation to the Permit to Mine boundary (green line):

**FIGURE 1: Well Locations**



All three wells were operated intermittently during the quarter. Operational data was monitored and recorded electronically and also recorded manually by operator each shift.

As per permit requirements, the following elements from Section K(6) of the UIC Permit have been included in this report:

- a.** Minimum, volume-weighted average, and maximum instantaneous injection rates for each well for each month
- b.** Minimum, average, and maximum daily injection pressures for each well for each month



- c. Total injection volume in barrels (bbl) for each well for each month, total for the quarter, and cumulative volume of waste injected to date.*
- d. Maximum and minimum annulus pressures for each month with alarm/kill pressure value*
- e. Quarterly analytical results*
- f. Permit exceedances during the quarter*
- g. Any alarms or shutdowns and corrective actions*
- h. Summary of well tests or workovers*

The Annual Summary is submitted pursuant to Section K(7) of the Permit. The following information is to be included for the Annual Report:

- i. Graphical representation of injection pressures and volumes for the previous five (5) year's operation and a digital file containing the data.*
- ii. Graphical representation of quality of injected waste over time for the previous five (5) year's operation and a digital file containing the data.*

Graphs of the injection pressures and volumes have been provided as **Appendix 3** and electronic data in Excel format is included via data disc.

## 2.0 Summary Data

**Tables 1A, 1B, 1C, and 2** below provide a data summary for above items **a**, **c**, and **d** above. Data for item **b** above is provided in **Appendix 1** including tables and charts of the daily injection pressure values.



**TABLE 1A: Operational Data Summary for DDW-1**

PARAMETER	UNITS	LC DW No. 1			
		October 2017	November 2017	December 2017	Quarterly Total/Min/Max/Avg
Operation Time	min	40109	12899	10487	63496
% Run Time	%	90%	30%	23%	48%
Injection Rate Minimum Instantaneous	gpm	0.0	0.0	0.0	0.0
Injection Rate Average (TWA)	gpm	1.3	0.9	0.7	0.9
Injection Rate Maximum Instantaneous	gpm	2.4	2.1	1.2	2.4
Injection Rate Maximum Permit Limit	gpm	50			50
Injection Pressure Daily Minimum	psig	529	350	486	350
Injection Pressure Daily Average	psig	579	532	560	557
Injection Pressure Daily Maximum	psig	602	596	598	602
Injection Pressure Permit Limit (LSIP)	psig	609			609
Injection Pressure Automatic Kill	psig	600			600
Injection Volume	gal	50589	11413	7205	69207
Injection Volume	bbl	1205	272	172	1648
Annulus Pressure Minimum	psig	278	230 (0)*	314	278
Annulus Pressure Average	psig	289	416	498	401
Annulus Pressure Maximum	psig	296	615	626	626
Annulus Pressure Permit Limit	psig	200-800			200-800
Annulus Pressure Automatic Kill	psig	N/A			N/A

*\*Values in parenthesis occurred during testing*



**TABLE 1B: Operational Data Summary for DDW-3**

PARAMETER	UNITS	LC DW No. 3			
		October 2017	November 2017	December 2017	Quarterly Total/Min/Max/Avg
Operation Time	min	44564	34691	31351	110607
% Run Time	%	100%	80%	70%	83%
Injection Rate Minimum Instantaneous	gpm	0	0	0	0
Injection Rate Average (TWA)	gpm	6	5	6	6
Injection Rate Maximum Instantaneous	gpm	8	7	11	11
Injection Rate Maximum Permit Limit	gpm	50			50
Injection Pressure Daily Minimum	psig	761	327	722	327
Injection Pressure Daily Average	psig	854	834	825	837
Injection Pressure Daily Maximum	psig	882	872	884	884
Injection Pressure Permit Limit (LSIP)	psig	915			915
Injection Pressure Automatic Kill	psig	910			910
Injection Volume	gal	264943	190359	181202	636504
Injection Volume	bbl	6308	4532	4314	15155
Annulus Pressure Minimum	psig	248	242	230 (0)*	242
Annulus Pressure Average	psig	273	271	270	272
Annulus Pressure Maximum	psig	281	278	352	352
Annulus Pressure Permit Limit	psig	200-800			200-800
Annulus Pressure Automatic Kill	psig	N/A			N/A

*\*Values in parentheses occurred during testing*



**TABLE 1C: Operational Data Summary for DDW-4**

PARAMETER	UNITS	LC DW No. 4			
		October 2017	November 2017	December 2017	Quarterly Total/Min/Max/Avg
Operation Time	min	43827	38718	39249	121794
% Run Time	%	98%	90%	88%	92%
Injection Rate Minimum Instantaneous	gpm	0	0	0	0
Injection Rate Average (TWA)	gpm	7	7	8	7
Injection Rate Maximum Instantaneous	gpm	9	13	18	18
Injection Rate Maximum Permit Limit	gpm	50			50
Injection Pressure Daily Minimum	psig	556	545	536	536
Injection Pressure Daily Average	psig	654	633	658	648
Injection Pressure Daily Maximum	psig	708	746	750	750
Injection Pressure Permit Limit (LSIP)	psig	838			838
Injection Pressure Automatic Kill	psig	830			830
Injection Volume	gal	293166	284884	320253	898303
Injection Volume	bbl	6980	6783	7625	21388
Annulus Pressure Minimum	psig	275	263	201 (0)*	263
Annulus Pressure Average	psig	292	292	325	303
Annulus Pressure Maximum	psig	316	303	534	534
Annulus Pressure Permit Limit	psig	200-800			200-800
Annulus Pressure Automatic Kill	psig	N/A			N/A

*\*Values in parentheses occurred during testing*

**TABLE 2: Cumulative Injection Volumes to Date**

TIME PERIOD	UNITS	LC DW No. 1	LC DW No. 3	LC DW No. 4
2013	bbl	14,625	N/A	6,471
2014	bbl	31,278	8,239	164,694
2015	bbl	14,966	130,113	105,999
2016	bbl	9,300	95,653	107,254
2017 Q1	bbl	2,431	19,936	22,367
2017 Q2	bbl	3,674	17,046	23,395
2017 Q3	bbl	2,661	16,536	14,921
2017 Q4	bbl	1,648	15,155	21,388
<b>CUMULATIVE TOTAL TO DATE</b>	<b>bbl</b>	<b>80,583</b>	<b>302,677</b>	<b>466,489</b>



### 3.0 Analytical Results

A quarterly grab sample of the injectate was collected from the Plant waste water line upstream of the branch points to each individual well. Sample parameters pH, conductivity, and temperature were measured with a field meter at the sampling site or in the onsite lab and other applicable parameters were analyzed by Energy Laboratories in Casper, WY. Results of the sample analyses are summarized in **Table 3** below and the associated lab report is included as **Appendix 2**.

**TABLE 3: Analytical Results Summary**

<b>Sample ID:</b> DDW-Injectate			
<b>Sample Date:</b> 11/30/2017			
Lab Analyte or Parameter	Method Used	Results	Units
pH, field	SM4500-H <sup>+</sup> B	6.67	s.u.
Specific Cond. at 25°C, field	120.1	46,300	uS/cm
Temperature, field	SM2550B	17.0	°C
Specific Gravity	n/a	1.026	---
Total Dissolved Solids	SM2540C	31,000	mg/L
Bicarbonate	SM2320B	462	mg/L
Carbonate	SM2320B	ND(5)	mg/L
Chloride, total	300.0	18,300	mg/L
Sulfate, total	300.0	2,660	mg/L
Sulfide (as hydrogen sulfide)	A4500-S F	ND(0.04)	mg/L
Arsenic, dissolved	200.8	0.003	mg/L
Selenium, dissolved	200.8	0.835	mg/L
Vanadium, dissolved	200.8	ND(0.01)	mg/L
Uranium, total	200.7	8.28	mg/L
Radium-226, total	E903.0	1,280	pCi/L

The only constituent with a defined Permit limit is pH which must have a value between 2.0 and 12.5. The measured value for pH of 6.67 was within the limit.

### 4.0 Permit Exceedances

No operational exceedances occurred during the quarter (**Table 4**). However, some parameters were outside of limits during MIT and falloff testing as noted in the data summary.





**TABLE 4: Summary of Exceedances**

Event	Well	Date	Limit Exceeded	Peak Value	Permit Limit	Comment
No exceedances during normal operations occurred during the quarter						

## 5.0 Alarms, Shut-Downs, and Corrective Actions

Nominal shutdowns occurred automatically due to pressure settings or due to maintenance activity such as changing inline filters or program changes. Intermittent operation of the injection systems is typical.

## 6.0 Summary of Maintenance, Well Tests, or Workovers

Maintenance completed during the quarter included:

- 11/21 – 11/22/2017: DDW-1 Bleed off annulus pressure for the addition of ANHIB corrosion inhibitor fluid into annular space
- 11/22/2017: Replacement of leaking pressure valve and piping for the annulus pressure line on DDW-1
- 12/8/2017 & 12/12/2017: DDW-3 Bleed off annulus pressure and preparation for fill with ANHIB.
- 11/9/2017: DDW-4 Bleed off annulus pressure for MIT
- 12/8 – 12/13/2017: DDW-4 Bleed off annulus pressure for the addition of ANHIB into annular space

The annual falloff testing and 5-year Mechanical Integrity Testing (MIT) was conducted in November and December according to the following schedule:

Well	Falloff Test	MIT Standard Annulus Pressure Test	MIT Temperature Survey and RAT Survey
LC DW No.1	11/11 – 11/13/2017	12/5/2017	11/8/2017
LC DW No.3	11/9 – 11/11/2017	N/A	N/A
LC DW No.4	11/7 – 11/9/2017	11/9/2017	11/9/2017

*RAT – Radioactive Tracer*



Details of the testing are included in the testing report completed and submitted to UIC by Petrotek Engineering Corporation dated December 12, 2017.

Testing of the pressure switches to verify operation of automatic shutdown and pressures occurred in October and December. Digital shutoff is tested by reducing the shutoff pressure setting to prevent test pressure from exceeding permit limit and verifying the system shuts off at that pressure. Results of the testing are summarized on **Table 5**:

**TABLE 5: Summary of Automatic Pressure Shutoff Testing**

Well	Permit Pressure Limit (psi)	Test Date	Digital Shutoff Tested at (psi)	Digital Shutoff Set to (psi)	Digital Shutoff Function	Analog Pressure Switch Shutoff At (psi)	Analog Pressure Switch Function
DDW-1	609	10/23/2017	566	600	Pass	---	---
DDW-1	609	12/11/2017	---	---	---	605	Pass
DDW-3	915	10/24/2017	850	890	Pass	---	---
DDW-3	915	12/8/2017	---	---	---	911	Pass
DDW-4	838	10/23/2017	578	810	Pass	---	---
DDW-4	838	12/8/2017	---	---	---	830	Pass



## APPENDIX 1

**APPENDIX 1: Daily Injection Pressures**  
**DDW-1 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
10/1/2017	580	583	584	599	609	
10/2/2017	582	586	589	599	609	
10/3/2017	585	586	590	599	609	
10/4/2017	550	583	595	599	609	
10/5/2017	542	575	593	599	609	
10/6/2017	555	583	593	599	609	
10/7/2017	529	560	585	599	609	
10/8/2017	581	592	602	599	609	
10/9/2017	550	583	598	599	609	
10/10/2017	568	589	599	599	609	
10/11/2017	551	557	570	599	609	
10/12/2017	558	567	576	599	609	
10/13/2017	574	582	590	599	609	
10/14/2017	588	595	599	599	609	
10/15/2017	547	577	599	599	609	
10/16/2017	572	587	592	599	609	
10/17/2017	535	550	573	599	609	
10/18/2017	535	541	555	599	609	
10/19/2017	555	575	589	599	609	
10/20/2017	564	589	599	599	609	
10/21/2017	549	584	602	599	609	
10/22/2017	546	579	599	599	609	
10/23/2017	559	586	593	599	609	
10/24/2017	558	583	594	599	609	
10/25/2017	551	567	581	599	609	
10/26/2017	534	551	570	599	609	
10/27/2017	543	574	592	599	609	
10/28/2017	545	580	596	599	609	
10/29/2017	534	570	585	599	609	
10/30/2017	582	584	587	599	609	
10/31/2017	564	585	594	599	609	
11/1/2017	566	588	596	599	609	
11/2/2017	531	567	594	599	609	
11/3/2017	563	572	576	599	609	
11/4/2017	555	559	565	599	609	
11/5/2017	555	567	582	599	609	
11/6/2017	581	588	593	599	609	
11/7/2017	513	551	592	599	609	
11/8/2017	486	503	533	599	609	
11/9/2017	466	481	505	599	609	
11/10/2017	350	492	506	599	609	
11/11/2017	---	---	---	599	609	Falloff Test

**APPENDIX 1: Daily Injection Pressures**  
**DDW-1 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

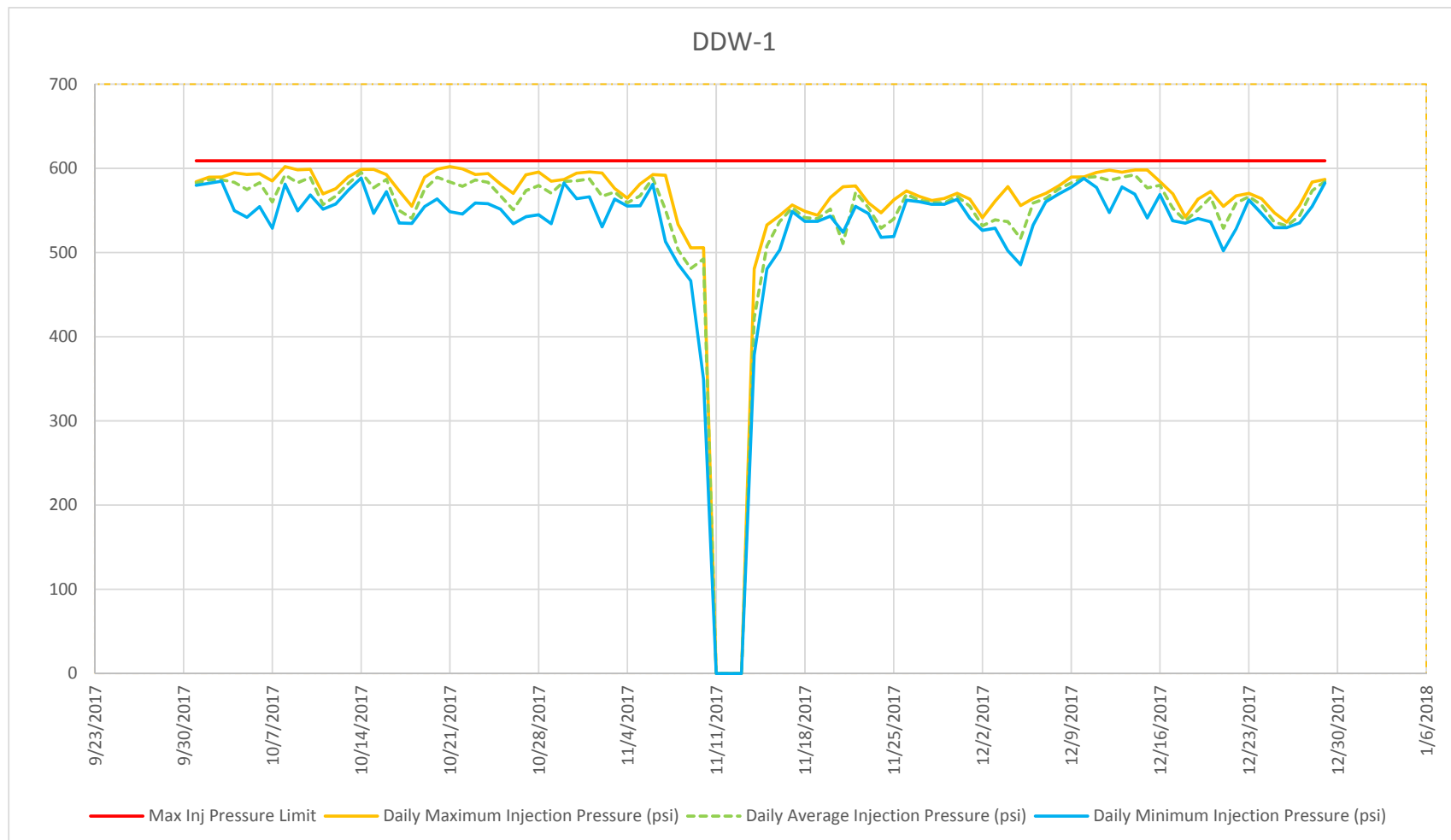
Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
11/12/2017	---	---	---	599	609	Falloff Test
11/13/2017	---	---	---	599	609	Falloff Test
11/14/2017	378	422	481	599	609	
11/15/2017	480	508	533	599	609	
11/16/2017	503	537	544	599	609	
11/17/2017	549	553	557	599	609	
11/18/2017	537	541	549	599	609	
11/19/2017	537	540	544	599	609	
11/20/2017	543	552	565	599	609	
11/21/2017	524	511	578	599	609	
11/22/2017	555	572	579	599	609	
11/23/2017	546	553	559	599	609	
11/24/2017	518	529	547	599	609	
11/25/2017	519	540	562	599	609	
11/26/2017	562	569	573	599	609	
11/27/2017	560	562	567	599	609	
11/28/2017	557	560	562	599	609	
11/29/2017	557	559	564	599	609	
11/30/2017	563	567	570	599	609	
12/1/2017	541	555	564	599	609	
12/2/2017	526	532	541	599	609	
12/3/2017	529	539	561	599	609	
12/4/2017	502	537	578	599	609	
12/5/2017	486	517	556	599	609	
12/6/2017	533	559	564	599	609	
12/7/2017	560	564	570	599	609	
12/8/2017	570	575	579	599	609	
12/9/2017	578	583	590	599	609	
12/10/2017	588	589	590	599	609	
12/11/2017	577	590	595	599	609	
12/12/2017	548	586	598	599	609	
12/13/2017	578	589	595	599	609	
12/14/2017	569	592	598	601	609	
12/15/2017	541	577	598	601	609	
12/16/2017	569	580	584	601	609	
12/17/2017	538	553	570	601	609	
12/18/2017	535	538	542	601	609	
12/19/2017	540	551	563	601	609	
12/20/2017	537	566	573	601	609	
12/21/2017	502	529	555	601	609	
12/22/2017	528	559	567	601	609	
12/23/2017	562	566	570	601	609	

**APPENDIX 1: Daily Injection Pressures**  
**DDW-1 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
12/24/2017	546	557	564	601	609	
12/25/2017	530	536	548	601	609	
12/26/2017	529	532	536	601	609	
12/27/2017	535	544	556	601	609	
12/28/2017	555	574	584	601	609	
12/29/2017	583	584	587	601	609	
12/30/2017	585	588	590	601	609	
12/31/2017	579	589	593	601	609	

*psi: pounds per square inch*

APPENDIX 1: Daily Injection Pressures  
DDW-1 4th Quarter 2017  
Lost Creek ISR Project 13-409



**APPENDIX 1: Daily Injection Pressures**  
**DDW-3 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
10/1/2017	859	865	880	885	915	
10/2/2017	875	879	882	885	915	
10/3/2017	869	873	878	885	915	
10/4/2017	867	871	879	885	915	
10/5/2017	867	871	876	885	915	
10/6/2017	868	869	871	885	915	
10/7/2017	834	852	857	885	915	
10/8/2017	795	816	858	885	915	
10/9/2017	799	832	856	885	915	
10/10/2017	849	854	858	885	915	
10/11/2017	852	863	866	885	915	
10/12/2017	864	866	868	885	915	
10/13/2017	861	864	871	885	915	
10/14/2017	761	812	872	885	915	
10/15/2017	781	801	817	885	915	
10/16/2017	795	833	863	885	915	
10/17/2017	861	868	876	885	915	
10/18/2017	863	865	872	885	915	
10/19/2017	866	871	874	885	915	
10/20/2017	864	866	868	885	915	
10/21/2017	866	869	874	885	915	
10/22/2017	787	834	874	885	915	
10/23/2017	786	793	832	885	915	
10/24/2017	831	866	881	885	915	
10/25/2017	866	871	875	885	915	
10/26/2017	867	871	874	885	915	
10/27/2017	856	859	872	885	915	
10/28/2017	857	860	870	885	915	
10/29/2017	868	873	876	885	915	
10/30/2017	873	875	876	885	915	
10/31/2017	831	853	876	885	915	
11/1/2017	829	833	839	885	915	
11/2/2017	836	847	856	885	915	
11/3/2017	854	866	872	885	915	
11/4/2017	864	867	872	885	915	
11/5/2017	780	809	871	885	915	
11/6/2017	781	794	849	885	915	
11/7/2017	327	454	852	885	915	
11/8/2017	832	848	854	885	915	
11/9/2017	---	---	---	885	915	Falloff Test
11/10/2017	---	---	---	885	915	Falloff Test
11/11/2017	---	---	---	885	915	Falloff Test



**APPENDIX 1: Daily Injection Pressures**  
**DDW-3 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

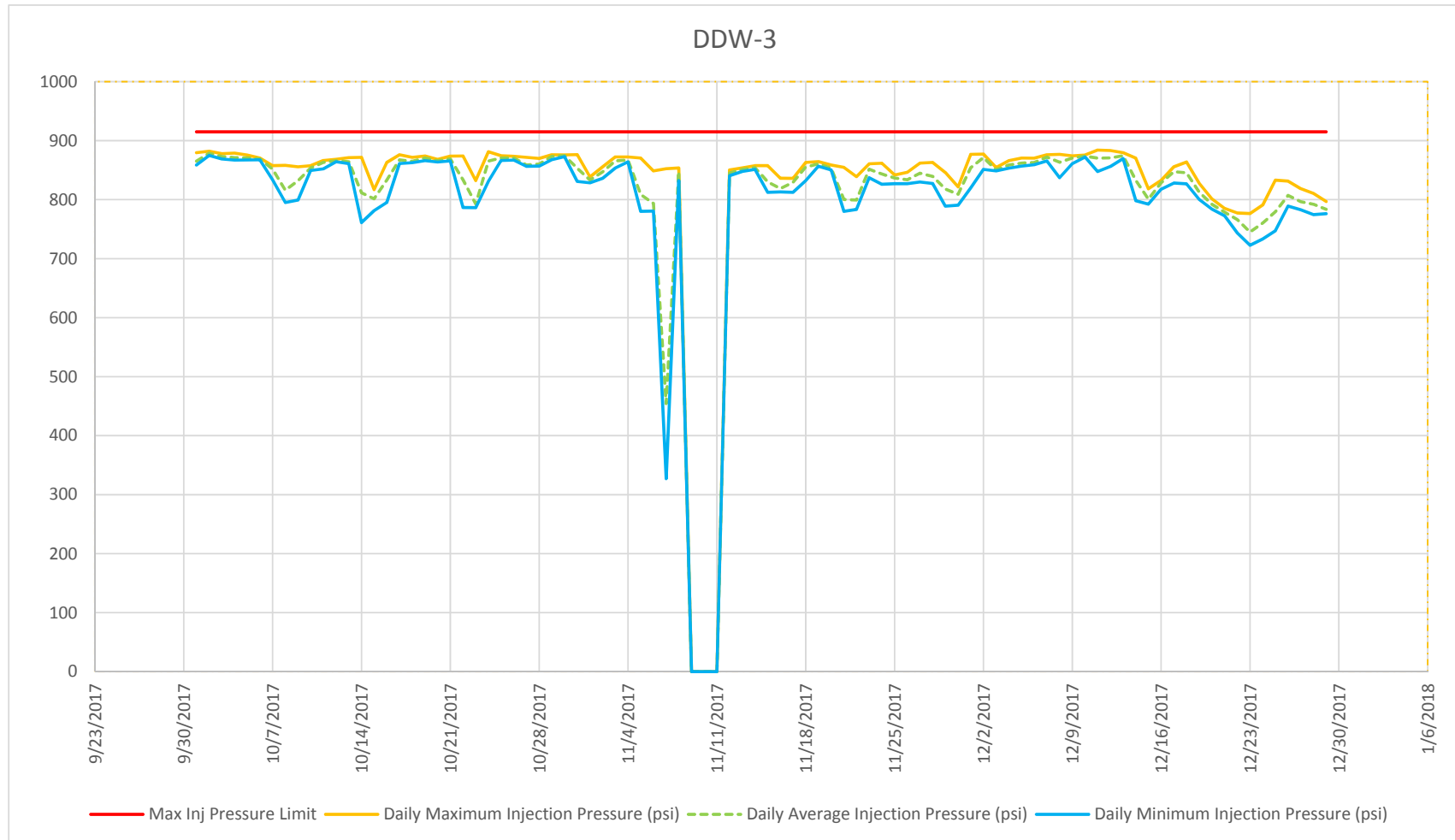
Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
11/12/2017	841	845	850	885	915	
11/13/2017	848	851	854	885	915	
11/14/2017	851	854	858	885	915	
11/15/2017	812	830	857	885	915	
11/16/2017	813	819	836	885	915	
11/17/2017	812	829	836	885	915	
11/18/2017	832	855	863	885	915	
11/19/2017	857	861	865	885	915	
11/20/2017	850	853	859	885	915	
11/21/2017	780	800	855	885	915	
11/22/2017	783	799	839	885	915	
11/23/2017	837	851	861	885	915	
11/24/2017	826	843	862	885	915	
11/25/2017	827	837	842	885	915	
11/26/2017	827	834	847	885	915	
11/27/2017	830	845	862	890	915	
11/28/2017	827	840	863	890	915	
11/29/2017	789	818	846	890	915	
11/30/2017	791	809	822	890	915	
12/1/2017	820	854	877	890	915	
12/2/2017	851	871	877	890	915	
12/3/2017	849	851	855	890	915	
12/4/2017	853	859	866	890	915	
12/5/2017	857	862	871	890	915	
12/6/2017	859	863	870	890	915	
12/7/2017	866	872	876	890	915	
12/8/2017	837	863	877	890	915	
12/9/2017	861	871	874	890	915	
12/10/2017	872	874	876	890	915	
12/11/2017	848	870	884	890	915	
12/12/2017	856	871	883	890	915	
12/13/2017	870	874	880	890	915	
12/14/2017	798	833	870	890	915	
12/15/2017	792	801	818	890	915	
12/16/2017	818	829	833	890	915	
12/17/2017	828	847	856	890	915	
12/18/2017	827	846	864	890	915	
12/19/2017	800	813	828	890	915	
12/20/2017	784	792	801	890	915	
12/21/2017	773	779	785	890	915	
12/22/2017	744	766	777	890	915	
12/23/2017	723	745	776	890	915	

**APPENDIX 1: Daily Injection Pressures**  
**DDW-3 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Automatic Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
12/24/2017	733	761	791	890	915	
12/25/2017	747	779	833	890	915	
12/26/2017	789	807	831	890	915	
12/27/2017	783	797	819	890	915	
12/28/2017	775	792	810	890	915	
12/29/2017	776	784	797	890	915	
12/30/2017	722	742	766	890	915	
12/31/2017	754	784	807	890	915	

*psi: pounds per square inch*

APPENDIX 1: Daily Injection Pressures  
DDW-3 4th Quarter 2017  
Lost Creek ISR Project 13-409



**APPENDIX 1: Daily Injection Pressures**  
**DDW-4 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
10/1/2017	645	680	707	810	838	
10/2/2017	658	685	708	810	838	
10/3/2017	653	683	707	810	838	
10/4/2017	657	684	708	810	838	
10/5/2017	657	685	708	810	838	
10/6/2017	656	683	708	810	838	
10/7/2017	611	652	692	810	838	
10/8/2017	577	615	674	810	838	
10/9/2017	589	649	687	810	838	
10/10/2017	622	660	697	810	838	
10/11/2017	642	673	700	810	838	
10/12/2017	624	671	701	810	838	
10/13/2017	591	666	701	810	838	
10/14/2017	556	595	662	810	838	
10/15/2017	565	615	649	810	838	
10/16/2017	609	659	695	810	838	
10/17/2017	628	666	695	810	838	
10/18/2017	640	666	690	810	838	
10/19/2017	640	668	692	810	838	
10/20/2017	639	664	685	810	838	
10/21/2017	617	662	689	810	838	
10/22/2017	564	608	658	810	838	
10/23/2017	564	612	679	810	838	
10/24/2017	639	667	688	810	838	
10/25/2017	641	665	688	810	838	
10/26/2017	628	661	686	810	838	
10/27/2017	627	653	673	810	838	
10/28/2017	628	660	688	810	838	
10/29/2017	639	669	689	810	838	
10/30/2017	627	668	688	810	838	
10/31/2017	600	631	687	810	838	
11/1/2017	599	627	649	810	838	
11/2/2017	611	647	676	810	838	
11/3/2017	635	662	684	810	838	
11/4/2017	583	652	680	810	838	
11/5/2017	551	580	616	810	838	
11/6/2017	545	606	657	810	838	
11/7/2017	---	---	---	810	838	Falloff Test
11/8/2017	---	---	---	810	838	Falloff Test
11/9/2017	---	---	---	810	838	Falloff Test
11/10/2017	576	637	688	810	838	
11/11/2017	605	652	693	810	838	

**APPENDIX 1: Daily Injection Pressures**  
**DDW-4 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

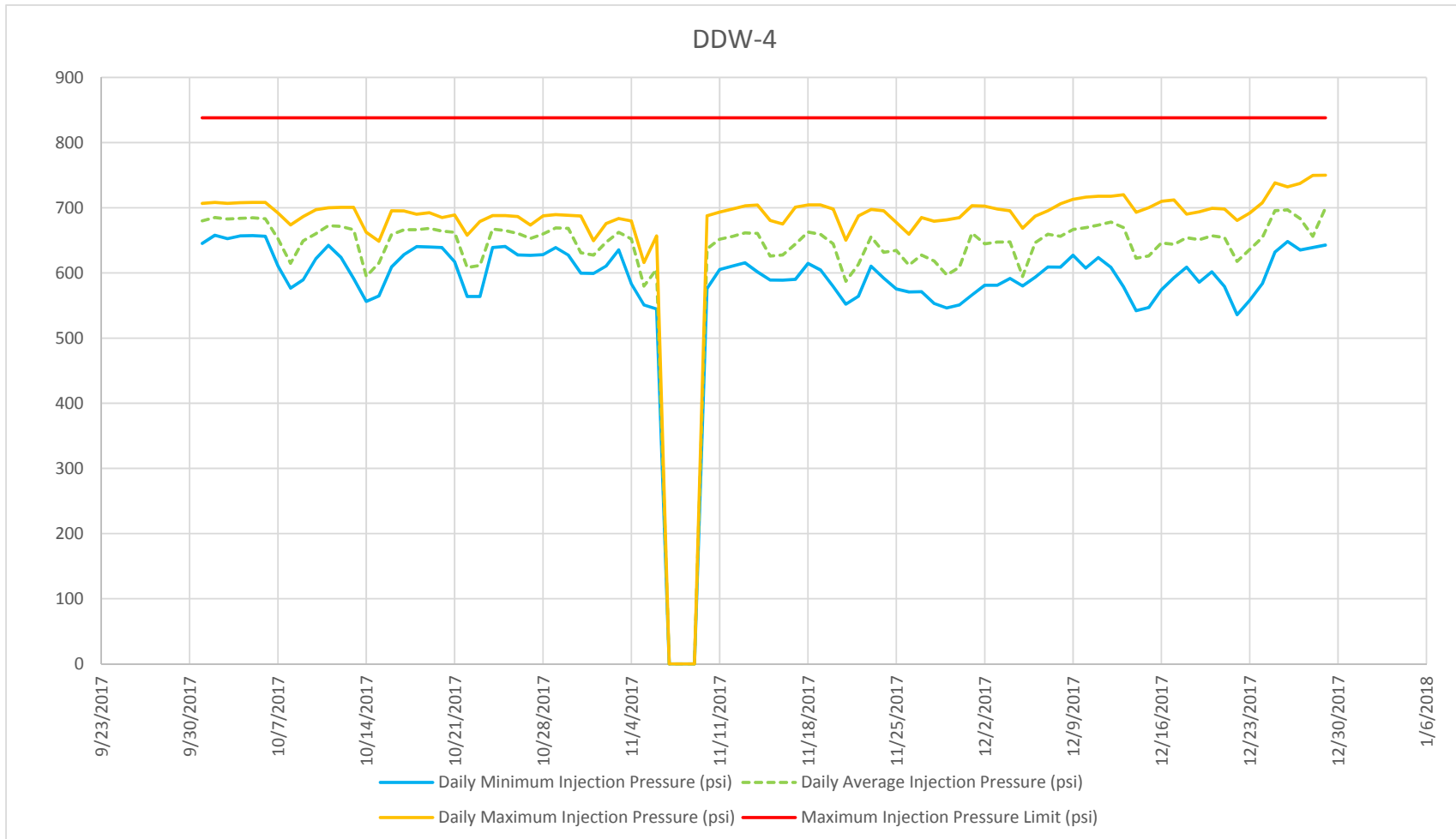
Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
11/12/2017	611	656	698	810	838	
11/13/2017	616	661	703	810	838	
11/14/2017	602	661	704	810	838	
11/15/2017	589	626	680	810	838	
11/16/2017	589	628	675	810	838	
11/17/2017	590	644	701	810	838	
11/18/2017	615	663	704	810	838	
11/19/2017	604	659	704	810	838	
11/20/2017	579	645	698	810	838	
11/21/2017	552	587	650	810	838	
11/22/2017	564	613	688	810	838	
11/23/2017	610	656	697	810	838	
11/24/2017	592	631	695	810	838	
11/25/2017	575	634	677	810	838	
11/26/2017	571	612	659	810	838	
11/27/2017	571	627	685	810	838	
11/28/2017	553	618	679	810	838	
11/29/2017	546	597	681	810	838	
11/30/2017	551	609	685	810	838	
12/1/2017	566	661	703	810	838	
12/2/2017	581	645	702	810	838	
12/3/2017	581	647	698	810	838	
12/4/2017	592	647	695	810	838	
12/5/2017	580	594	669	810	838	
12/6/2017	594	646	687	810	838	
12/7/2017	609	659	695	810	838	
12/8/2017	609	656	706	810	838	
12/9/2017	627	667	713	810	838	
12/10/2017	607	669	716	810	838	
12/11/2017	624	673	718	810	838	
12/12/2017	609	678	718	810	838	
12/13/2017	579	670	720	810	838	
12/14/2017	542	623	693	828	838	
12/15/2017	547	626	700	828	838	
12/16/2017	574	646	710	828	838	
12/17/2017	593	644	712	828	838	
12/18/2017	609	654	690	828	838	
12/19/2017	586	651	694	828	838	
12/20/2017	602	657	699	828	838	
12/21/2017	579	654	698	828	838	
12/22/2017	536	618	680	828	838	
12/23/2017	558	636	692	828	838	

**APPENDIX 1: Daily Injection Pressures**  
**DDW-4 4th Quarter 2017**  
**Lost Creek ISR Project 13-409**

Date	Daily Minimum Injection Pressure (psi)	Daily Average Injection Pressure (psi)	Daily Maximum Injection Pressure (psi)	Shutdown Pressure (psi)	Maximum Injection Pressure Limit (psi)	Comments
12/24/2017	583	654	708	828	838	
12/25/2017	632	696	738	828	838	
12/26/2017	648	697	732	828	838	
12/27/2017	635	683	737	828	838	
12/28/2017	639	656	750	828	838	
12/29/2017	643	700	750	828	838	
12/30/2017	589	623	676	828	838	
12/31/2017	563	575	589	828	838	

*psi: pounds per square inch*

APPENDIX 1: Daily Injection Pressures  
DDW-4 4th Quarter 2017  
Lost Creek ISR Project 13-409





## APPENDIX 2





## ANALYTICAL SUMMARY REPORT

December 20, 2017

UR Energy USA Inc  
10758 W Centennial Rd Ste 200  
Ken Caryl Ranch, CO 80127

Work Order: C17120029

Project Name: Lost Creek Class I

Energy Laboratories, Inc. Casper WY received the following 1 sample for UR Energy USA Inc on 12/1/2017 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C17120029-001	DDW-Injectate	11/30/17 09:00	12/01/17	Aqueous	Metals by ICP/ICPMS, Total Alkalinity Conductivity Specific Gravity Anions by Ion Chromatography pH Metals Preparation by EPA 200.2 Radium 226, Total Solids, Total Dissolved Sulfide, Methylene Blue Colorimetric

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:



**CLIENT:** UR Energy USA Inc  
**Project:** Lost Creek Class I  
**Work Order:** C17120029

**Report Date:** 12/20/17

## **CASE NARRATIVE**

Tests associated with analyst identified as ELI-B were subcontracted to Energy Laboratories, 1120 S. 27th St., Billings, MT, EPA Number MT00005.

Tests associated with analyst identified as ELI-G were subcontracted to Energy Laboratories, 400 W. Boxelder Rd., Gillette, WY, EPA Number WY00006.



## LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc  
**Project:** Lost Creek Class I  
**Lab ID:** C17120029-001  
**Client Sample ID:** DDW-Injectate

**Report Date:** 12/20/17  
**Collection Date:** 11/30/17 09:00  
**Date Received:** 12/01/17  
**Matrix:** Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>MAJOR IONS</b>							
Carbonate as CO <sub>3</sub>	ND	mg/L		5		A2320 B	12/04/17 16:47 / mvr
Bicarbonate as HCO <sub>3</sub>	462	mg/L		5		A2320 B	12/04/17 16:47 / mvr
Chloride	18300	mg/L	D	50		E300.0	12/05/17 19:06 / ljl
Sulfate	2660	mg/L	D	200		E300.0	12/05/17 19:06 / ljl
<b>NON-METALS</b>							
Sulfide	ND	mg/L		0.04		A4500-S D	12/06/17 11:55 / eli-b
Sulfide as Hydrogen Sulfide (H <sub>2</sub> S)	ND	mg/L		0.04		A4500-S D	12/06/17 11:55 / eli-b
<b>PHYSICAL PROPERTIES</b>							
Specific Gravity 60/60F	1.026	unitless				D1429	12/10/17 08:26 / eli-g
Conductivity @ 25 C	56700	umhos/cm	E	5		A2510 B	12/04/17 15:35 / mvr
pH	6.64	s.u.	H	0.01		A4500-H B	12/04/17 15:35 / mvr
Solids, Total Dissolved TDS @ 180 C	31000	mg/L	D	500		A2540 C	12/04/17 15:22 / mvr
<b>METALS, TOTAL</b>							
Arsenic	0.003	mg/L	D	0.002		E200.8	12/11/17 15:07 / eli-b
Selenium	0.835	mg/L	D	0.004		E200.8	12/11/17 15:07 / eli-b
Uranium	8.28	mg/L		0.0003		E200.8	12/11/17 15:07 / eli-b
Vanadium	ND	mg/L		0.01		E200.8	12/11/17 15:07 / eli-b
<b>RADIONUCLIDES, TOTAL</b>							
Radium 226	1280	pCi/L				E903.0	12/13/17 10:33 / arh
Radium 226 precision (±)	240	pCi/L				E903.0	12/13/17 10:33 / arh
Radium 226 MDC	0.1	pCi/L				E903.0	12/13/17 10:33 / arh

**Report Definitions:**

RL - Analyte reporting limit.  
QCL - Quality control limit.  
MDC - Minimum detectable concentration  
E - Estimated value. Result exceeds the instrument upper quantitation limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.  
D - RL increased due to sample matrix.  
H - Analysis performed past recommended holding time.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/07/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A2320 B										Batch: R230067
<b>Lab ID:</b> MBLK	2	Method Blank					Run: MANTECH_171204B			12/04/17 16:19
Carbonate as CO <sub>3</sub>		ND	mg/L		1					
Bicarbonate as HCO <sub>3</sub>		2	mg/L		1					
<b>Lab ID:</b> C17120010-001ADUP	2	Sample Duplicate					Run: MANTECH_171204B			12/04/17 16:39
Carbonate as CO <sub>3</sub>		ND	mg/L		5.0				10	
Bicarbonate as HCO <sub>3</sub>		26.7	mg/L		5.0			6.6	10	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/07/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: A2510 B</b>										Batch: R230063
<b>Lab ID: SC 100</b>	Initial Calibration Verification Standard									12/04/17 14:21
Conductivity @ 25 C	101	umhos/cm	5.0	101	90	110				
<b>Lab ID: SC 5000</b>	Initial Calibration Verification Standard									12/04/17 14:24
Conductivity @ 25 C	5130	umhos/cm	5.0	103	90	110				
<b>Lab ID: SC 20000</b>	Initial Calibration Verification Standard									12/04/17 14:27
Conductivity @ 25 C	20800	umhos/cm	5.0	104	90	110				
<b>Lab ID: SC 50000</b>	Initial Calibration Verification Standard									12/04/17 14:30
Conductivity @ 25 C	50600	umhos/cm	5.0	101	90	110				
<b>Lab ID: MBLK</b>	Method Blank									12/04/17 14:52
Conductivity @ 25 C	1	umhos/cm								
<b>Lab ID: C17120052-003ADUP</b>	Sample Duplicate									12/04/17 14:58
Conductivity @ 25 C	194	umhos/cm	5.0					0.2	10	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/07/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS171204A	
Lab ID: MB-1_171204A	Method Blank					Run: BAL-18_171204B			12/04/17 15:20	
Solids, Total Dissolved TDS @ 180 C		ND	mg/L	10						
Lab ID: LCS-2_171204A	Laboratory Control Sample					Run: BAL-18_171204B			12/04/17 15:21	
Solids, Total Dissolved TDS @ 180 C		1080	mg/L	11	98	90	110			
Lab ID: C17120007-001A DUP	Sample Duplicate					Run: BAL-18_171204B			12/04/17 15:21	
Solids, Total Dissolved TDS @ 180 C		624	mg/L	10				2.4	5	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/07/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	A4500-H B							Analytical Run: PHSC_101-C_171204A		
Lab ID:	6.86	Initial Calibration Verification Standard							12/04/17 14:17	
pH		6.86	s.u.	0.010	100	98	102			
Method:	A4500-H B							Batch: R230063		
Lab ID:	C17120052-003ADUP	Sample Duplicate				Run: PHSC_101-C_171204A			12/04/17 14:58	
pH		6.38	s.u.	0.010				0.2	3	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/07/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E300.0</b>										Analytical Run: IC3-C_171205A
<b>Lab ID: ICV</b>	2	Initial Calibration Verification Standard								12/05/17 15:54
Chloride		10.2	mg/L	1.0	102	90	110			
Sulfate		41.0	mg/L	1.0	102	90	110			
<b>Method: E300.0</b>										Batch: R230134
<b>Lab ID: ICB</b>	2	Method Blank								Run: IC3-C_171205A 12/05/17 16:11
Chloride		ND	mg/L	0.09						
Sulfate		ND	mg/L	0.10						
<b>Lab ID: LFB</b>	2	Laboratory Fortified Blank								Run: IC3-C_171205A 12/05/17 16:29
Chloride		10.1	mg/L	1.0	101	90	110			
Sulfate		40.6	mg/L	1.0	102	90	110			
<b>Lab ID: C17120007-001AMS</b>	2	Sample Matrix Spike								Run: IC3-C_171205A 12/05/17 17:21
Chloride		12.4	mg/L	1.0	102	80	120			
Sulfate		110	mg/L	1.0	101	80	120			
<b>Lab ID: C17120007-001AMSD</b>	2	Sample Matrix Spike Duplicate								Run: IC3-C_171205A 12/05/17 17:39
Chloride		12.5	mg/L	1.0	103	80	120	0.5	20	
Sulfate		111	mg/L	1.0	102	80	120	0.4	20	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.





## QA/QC Summary Report

Prepared by Gillette, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/10/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: D1429</b>							Batch: R240448		
<b>Lab ID: LCS</b>	Laboratory Control Sample		Run: BAL-ACCU-124_171210A				12/10/17 08:24		
Specific Gravity 60/60F	1.020	unitless	100	85	115				
<b>Lab ID: C17120029-001EDUP</b>	Sample Duplicate		Run: BAL-ACCU-124_171210A				12/10/17 08:27		
Specific Gravity 60/60F	1.026	unitless					0.0	1	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/12/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> A4500-S D										Batch: R291225
<b>Lab ID:</b> MBLK	2	Method Blank				Run: SPEC3_171206B				12/06/17 11:55
Sulfide		ND	mg/L	0.006						
Sulfide as Hydrogen Sulfide (H2S)		ND	mg/L	0.006						
<b>Lab ID:</b> LCS		Laboratory Control Sample				Run: SPEC3_171206B				12/06/17 11:55
Sulfide		0.199	mg/L	0.040	105	85	115			
<b>Lab ID:</b> B17120275-001EMS		Sample Matrix Spike				Run: SPEC3_171206B				12/06/17 11:55
Sulfide		0.281	mg/L	0.040	110	70	130			
<b>Lab ID:</b> B17120275-001EMSD		Sample Matrix Spike Duplicate				Run: SPEC3_171206B				12/06/17 11:55
Sulfide		0.275	mg/L	0.040	107	70	130	2.3	20	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/12/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: E200.8</b>							Analytical Run: ICPMS206-B_171211A			
<b>Lab ID: QCS</b>	4	Initial Calibration Verification Standard							12/11/17 10:25	
Arsenic		0.0499	mg/L	0.0050	100	90	110			
Selenium		0.0506	mg/L	0.0050	101	90	110			
Uranium		0.0200	mg/L	0.0010	100	90	110			
Vanadium		0.0506	mg/L	0.10	101	90	110			
<b>Method: E200.8</b>							Batch: 116418			
<b>Lab ID: MB-116418</b>	4	Method Blank							Run: ICPMS206-B_171211A 12/11/17 13:33	
Arsenic		ND	mg/L	0.0002						
Selenium		ND	mg/L	0.0004						
Uranium		0.00005	mg/L	0.00003						
Vanadium		ND	mg/L	0.00007						
<b>Lab ID: LCS-116418</b>	4	Laboratory Control Sample							Run: ICPMS206-B_171211A 12/11/17 15:21	
Arsenic		0.515	mg/L	0.0010	103	85	115			
Selenium		0.507	mg/L	0.0050	101	85	115			
Uranium		0.511	mg/L	0.0010	102	85	115			
Vanadium		0.527	mg/L	0.010	105	85	115			
<b>Lab ID: B17120337-003BMS3</b>	4	Sample Matrix Spike							Run: ICPMS206-B_171211A 12/11/17 15:24	
Arsenic		0.518	mg/L	0.0010	102	70	130			
Selenium		0.498	mg/L	0.0010	100	70	130			
Uranium		0.532	mg/L	0.00030	106	70	130			
Vanadium		0.525	mg/L	0.010	105	70	130			
<b>Lab ID: B17120337-003BMSD</b>	4	Sample Matrix Spike Duplicate							Run: ICPMS206-B_171211A 12/11/17 15:28	
Arsenic		0.527	mg/L	0.0010	103	70	130	1.8	20	
Selenium		0.497	mg/L	0.0010	99	70	130	0.2	20	
Uranium		0.526	mg/L	0.00030	105	70	130	1.2	20	
Vanadium		0.535	mg/L	0.010	107	70	130	1.9	20	

### Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



## QA/QC Summary Report

Prepared by Casper, WY Branch

**Client:** UR Energy USA Inc

**Report Date:** 12/15/17

**Project:** Lost Creek Class I

**Work Order:** C17120029

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-8767
Lab ID: LCS-RA226-8767		Laboratory Control Sample				Run: G542M-2_171204A				12/13/17 10:33
Radium 226		8.2	pCi/L		82	80	120			
Lab ID: MB-RA226-8767	3	Method Blank				Run: G542M-2_171204A				12/13/17 10:33
Radium 226		0.03	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C17120031-003DMS		Sample Matrix Spike				Run: G542M-2_171204A				12/13/17 10:33
Radium 226		18	pCi/L		90	70	130			
Lab ID: C17120031-003DMSD		Sample Matrix Spike Duplicate				Run: G542M-2_171204A				12/13/17 10:33
Radium 226		17	pCi/L		84	70	130	6.3	20	

### Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.

U - Not detected at minimum detectable concentration



## Work Order Receipt Checklist

UR Energy USA Inc

C17120029

Login completed by: Dorian Quis

Date Received: 12/1/2017

Reviewed by: Kasey Vidick

Received by: dcq

Reviewed Date: 12/4/2017

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	5.2°C On Ice		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>

---

### Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

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### Contact and Corrective Action Comments:

None



# Chain of Custody & Analytical Request Record

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Page 1 of 1

## Account Information (Billing Information)

Company/Name UR-ENERGY

Contact MIKE GARDNER

Phone (307) 265-2373 X321

Mailing Address 5080 ENTERPRISE DR SUITE 200

City, State, Zip CASPER WY 82409

Email MIKE.GARDNER@UR-ENERGY.COM

Receive Invoice ☐ Hard Copy ☐ Email ☐ Receive Report ☐ Hard Copy ☐ Email ☐

Purchase Order Quote

Bottle Order 52797

## Report Information (if different than Account Information)

Company/Name

Contact

Phone

Mailing Address

City, State, Zip

Email

Receive Report ☐ Hard Copy ☐ Email ☐

Special Report/Forms: ☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

## Comments

## Project Information

Project Name, PWSID, Permit, etc. WEST CREEK CREEK I

Sampler Name MDE Sampler Phone

Sample Origin State WY EPA/State Compliance ☐ Yes ☐ No

MINING CLIENTS, please indicate sample type.  
☐ If ore has been processed or refined, call before sending.  
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)\*

## Matrix Codes

A - Air

W - Water

S - Solids

V - Vegetation

B - Bioassay

O - Other

DW - Drinking Water

## Analysis Requested

PH/COND. ☒ RICHMOND ☒ CHLORIDE ☒ SULFATE ☒ IMPURITIES ☒ SPECIFIC GRAVITY ☒ TDS ☒ AS, SE, V, U (LOTH) ☒ Pb-226 (LOTH) ☒ See Attached

All turnaround times are standard unless marked as RUSH.  
 Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling - See Instructions Page

Sample Identification (Name, Location, Interval, etc.)	Collection Date	Time	Number of Containers	Matrix (See Codes Above)	RUSH TAT	ELI LAB ID Laboratory Use Only
1 DDW - IMPURITIES	11/30/2017	0900	4	W		C1712000
2						
3						
4						
5						
6						
7						
8						
9						
10						

Custody Relinquished by (print) MIKE GARDNER Signature [Signature] Date/Time 12/1/2017 1107

Record MUST be signed Relinquished by (print) [Signature] Signature [Signature] Date/Time 12/1/17 1108

Shipped By Blanco Cooler ID(s) ELI Custody Seals Y W C B B Receipt Temp Y N °C 5.2 Payment Type CC Cash CC Check CC Amount \$ Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.



## APPENDIX 3

**APPENDIX 3a: 5-Year Summary of Monthly  
Injection Pressures and Volumes  
2017 Annual Summary  
Lost Creek ISR Project 13-409**

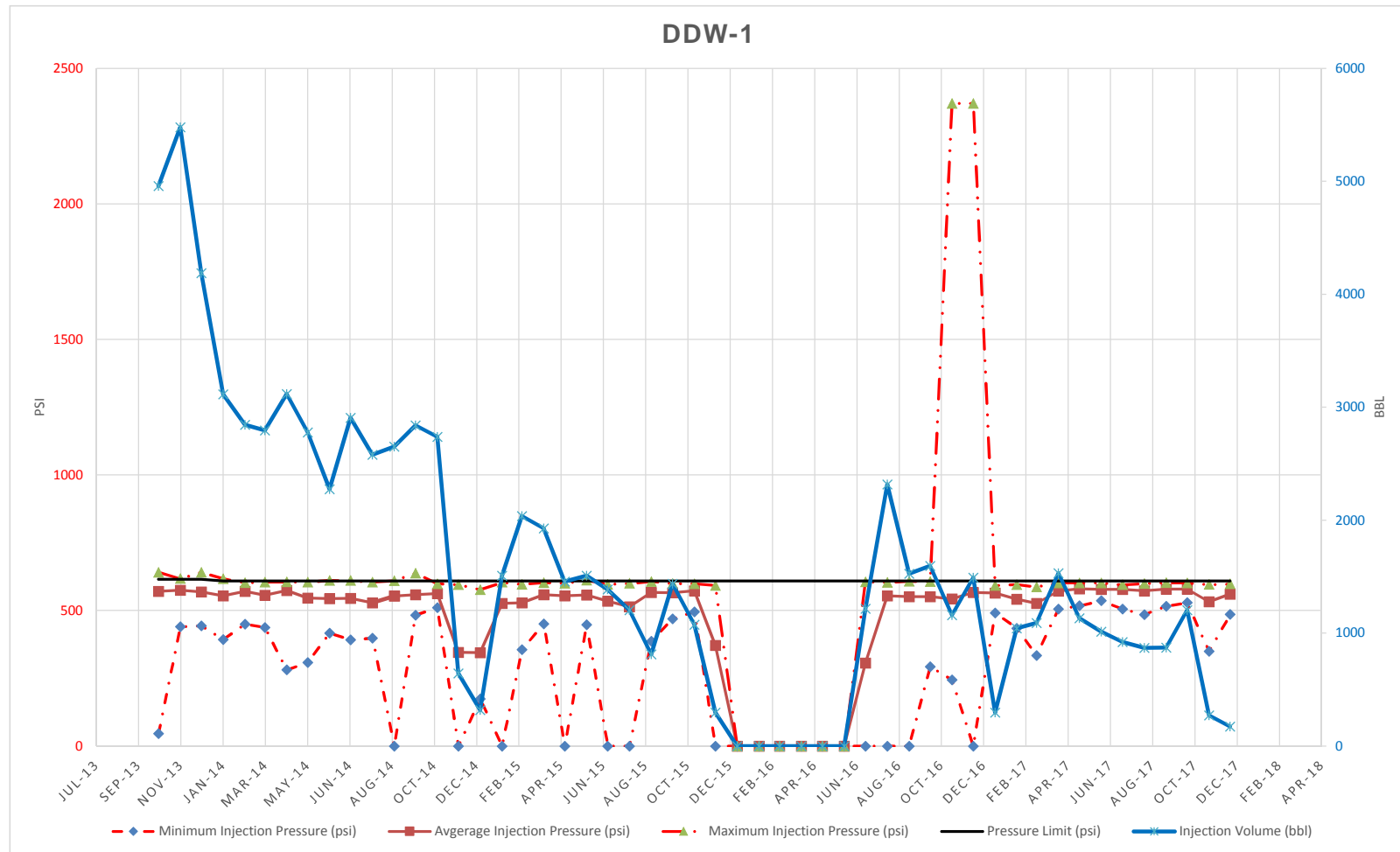
Date	DDW-1					DDW-3					DDW-4				
	Minimum Injection Pressure (psi)	Average Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)	Minimum Injection Pressure (psi)	Average Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)	Minimum Injection Pressure (psi)	Average Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)
Oct-13	46	570	641	615	4958										
Nov-13	440	575	618	615	5480										
Dec-13	443	569	641	615	4187						0	266	473	838	6471
Jan-14	393	554	617	609	3115						170	631	886	838	25430
Feb-14	450	571	602	609	2844						509	747	827	838	17769
Mar-14	437	556	605	609	2794						593	772	815	838	18937
Apr-14	281	574	606	609	3118						542	768	848	838	16846
May-14	308	546	605	609	2777						0	723	833	838	13994
Jun-14	417	544	611	609	2274						0	755	898	838	13163
Jul-14	392	545	611	609	2907						656	769	837	838	13333
Aug-14	398	528	605	609	2579						632	764	826	838	12700
Sep-14	0	554	610	609	2651						651	783	861	838	12977
Oct-14	483	558	637	609	2839						0	783	850	838	12416
Nov-14	511	562	599	609	2737						697	789	842	838	2369
Dec-14	0	346	596	609	643	0	228	517	915	8239	0	742	850	838	4760
Jan-15	174	344	577	609	317	0	704	796	915	14836	0	730	816	838	4020
Feb-15	0	526	604	609	1509	594	805	986	915	15442	0	777	830	838	8565
Mar-15	356	528	597	609	2037	630	803	942	915	12283	0	734	809	838	7117
Apr-15	451	559	603	609	1928	0	856	919	915	12514	0	667	761	838	5429
May-15	0	555	600	609	1457	0	852	1042	915	10422	614	760	819	838	12190
Jun-15	448	557	612	609	1509	0	832	903	915	8551	8	772	831	838	10164
Jul-15	0	534	597	609	1386	662	814	937	915	7843	0	710	814	838	7073
Aug-15	0	514	600	609	1203	0	747	855	915	10130	578	740	819	838	7090
Sep-15	387	567	606	609	811	567	704	820	915	5833	0	779	833	838	12210
Oct-15	469	566	599	609	1437	0	788	875	915	11992	148	765	854	838	10293
Nov-15	495	572	599	609	1073	707	847	910	915	9257	0	758	838	838	10993
Dec-15	0	371	592	609	297	0	819	914	915	11011	0	778	827	838	10855
Jan-16	0	0	0	609	0	0	768	910	915	9090	604	741	801	838	10085
Feb-16	0	0	0	609	0	724	819	899	915	7851	633	758	814	838	9129
Mar-16	0	0	0	609	0	746	836	909	915	9878	607	738	807	838	10625
Apr-16	0	0	0	609	0	767	858	916	915	9391	0	767	815	838	9893
May-16	0	0	0	609	0	0	861	919	915	9048	691	790	843	838	11805
Jun-16	0	0	0	609	0	0	866	924	915	8405	683	794	844	838	10842
Jul-16	0	306	606	609	1215	785	869	925	915	8233	610	774	830	838	9956
Aug-16	0	554	604	609	2316	0	840	920	915	7457	554	664	751	838	5598
Sep-16	0	551	608	609	1526	748	833	887	915	6790	573	679	752	838	6854
Oct-16	293	551	607	609	1595	720	834	897	915	6853	582	708	766	838	7443
Nov-16	245	542	2371	609	1158	0	770	886	915	5851	551	710	770	838	7081
Dec-16	0	567	2371	609	1490	706	814	898	915	6805	623	731	776	838	7945



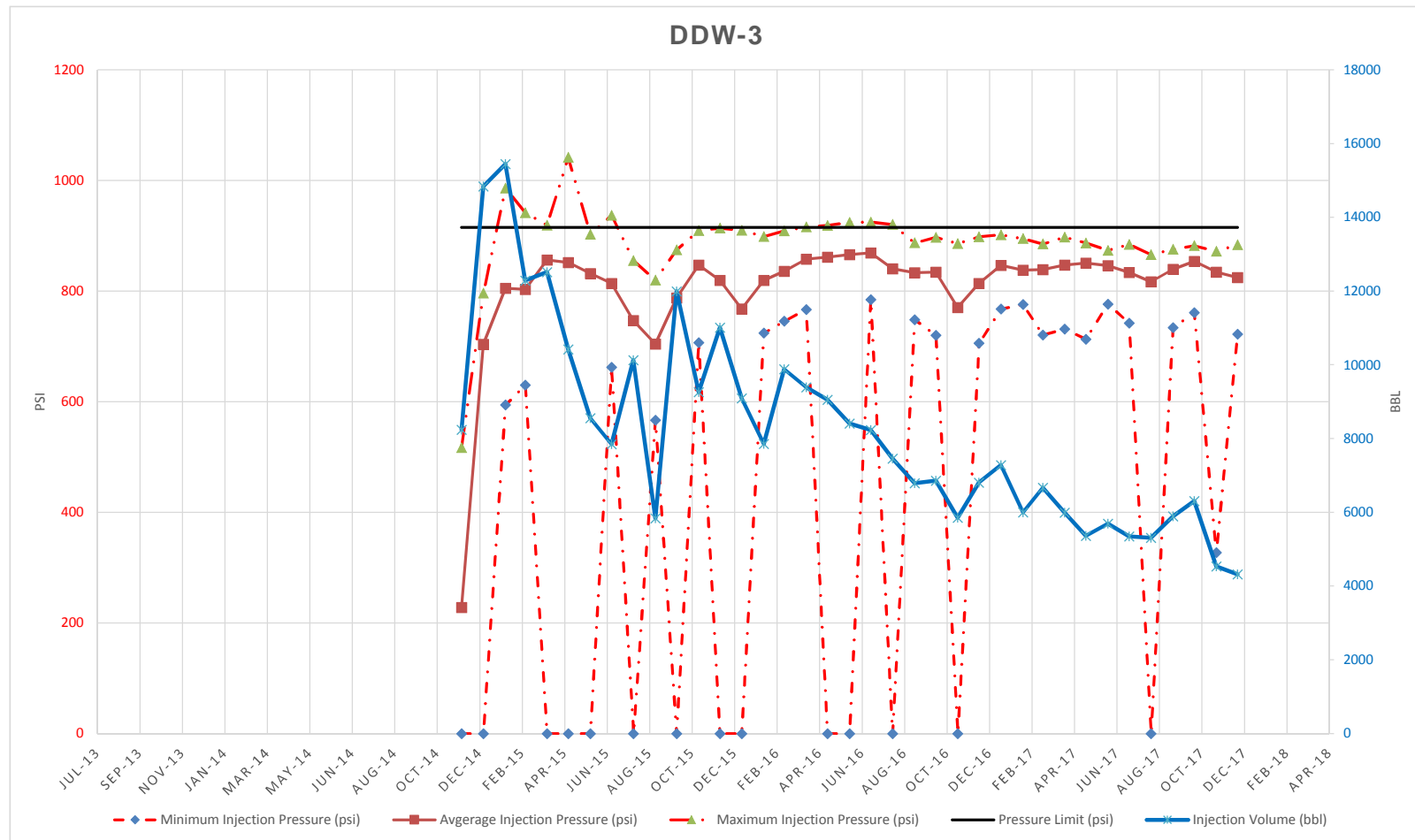
**APPENDIX 3a: 5-Year Summary of Monthly  
Injection Pressures and Volumes  
2017 Annual Summary  
Lost Creek ISR Project 13-409**

Date	DDW-1					DDW-3					DDW-4				
	Minimum Injection Pressure (psi)	Avgerage Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)	Minimum Injection Pressure (psi)	Avgerage Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)	Minimum Injection Pressure (psi)	Avgerage Injection Pressure (psi)	Maximum Injection Pressure (psi)	Pressure Limit (psi)	Injection Volume (bbl)
Jan-17	491	565	592	609	297	767	846	902	915	7278	597	733	781	838	7430
Feb-17	434	542	596	609	1043	776	838	895	915	5997	645	752	801	838	6950
Mar-17	334	527	587	609	1091	721	839	885	915	6661	615	737	780	838	8024
Apr-17	506	572	602	609	1530	731	847	898	915	5991	644	740	808	838	8327
May-17	518	580	602	609	1131	713	850	887	915	5363	479	747	785	838	7575
Jun-17	536	578	602	609	1013	776	846	874	915	5692	664	733	767	838	7493
Jul-17	506	578	595	609	921	742	834	884	915	5341	550	664	756	838	5111
Aug-17	485	573	600	609	870	0	817	866	915	5305	528	645	716	838	3845
Sep-17	516	578	603	609	870	734	839	876	915	5889	538	657	711	838	5965
Oct-17	529	579	602	609	1205	761	854	882	915	6308	556	654	708	838	6980
Nov-17	350	532	596	609	272	327	834	872	915	4532	545	633	746	838	6783
Dec-17	486	560	598	609	172	722	825	884	915	4314	536	658	750	838	7625

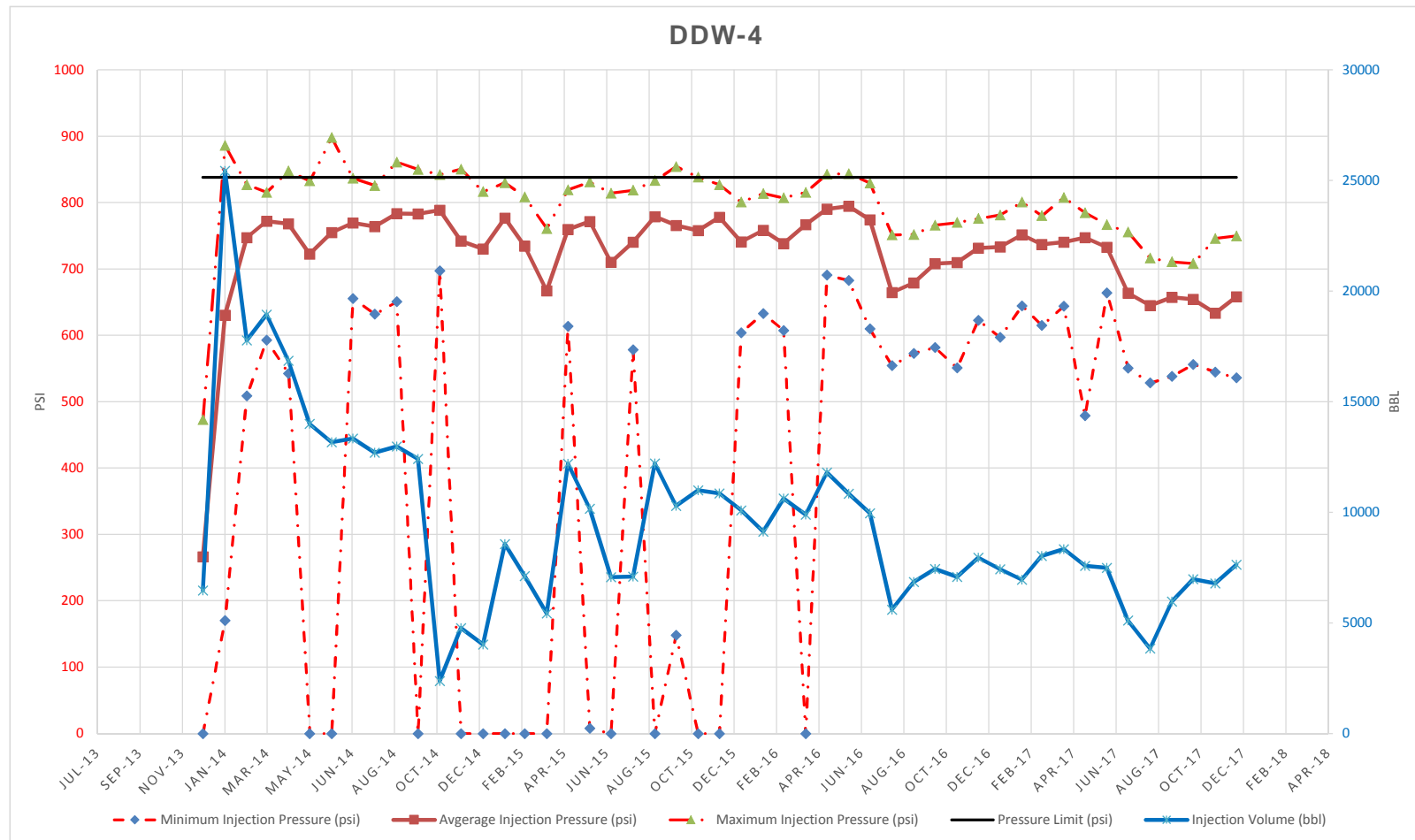
**APPENDIX 3a: 5-Year Summary of Monthly  
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Lost Creek ISR Project 13-409**



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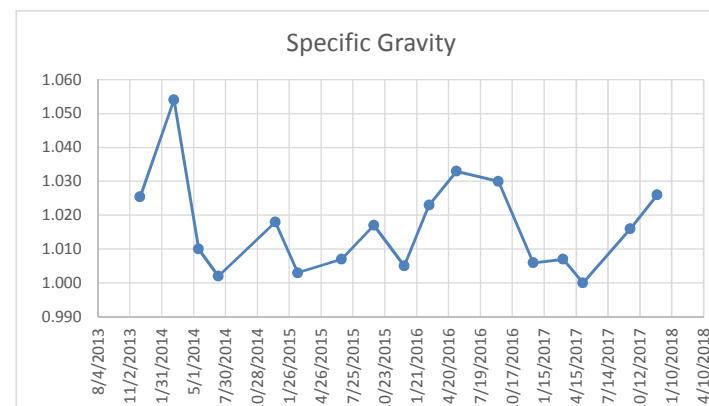
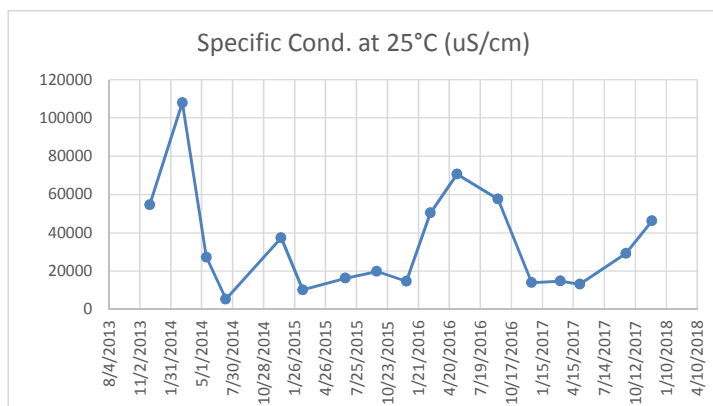
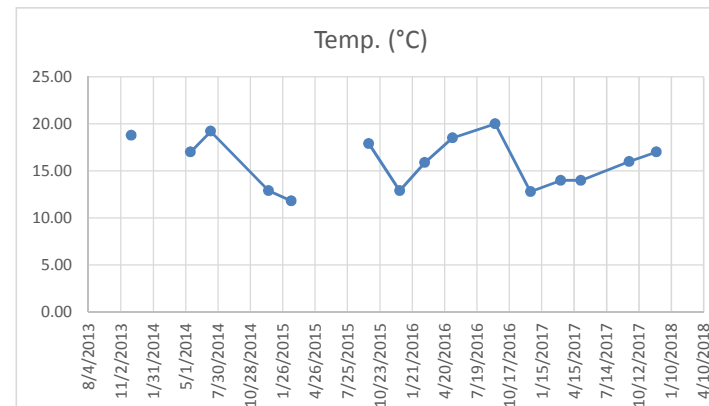
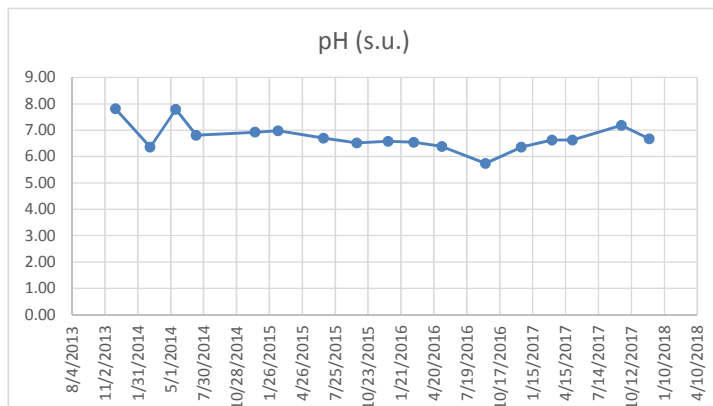
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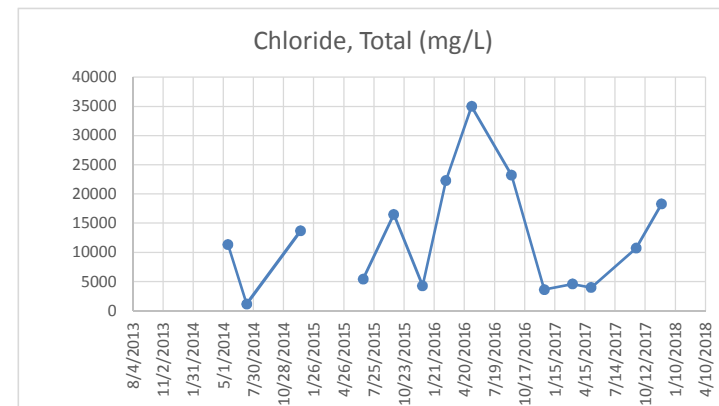
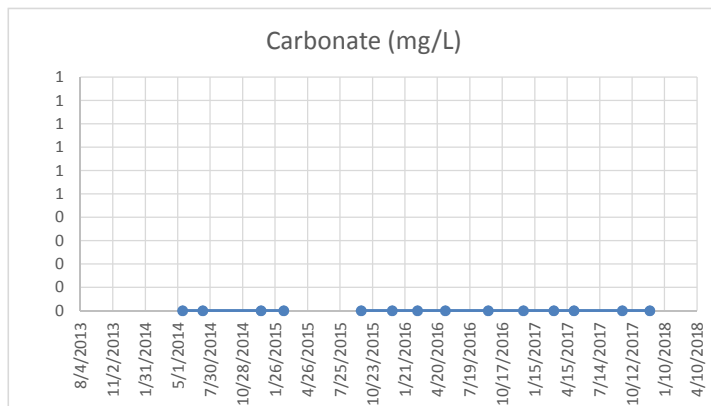
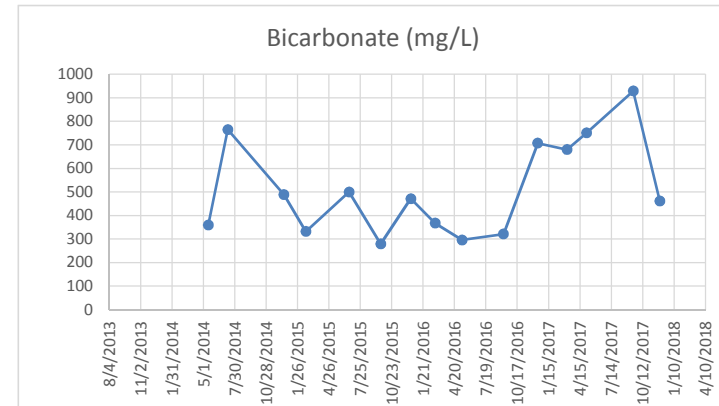
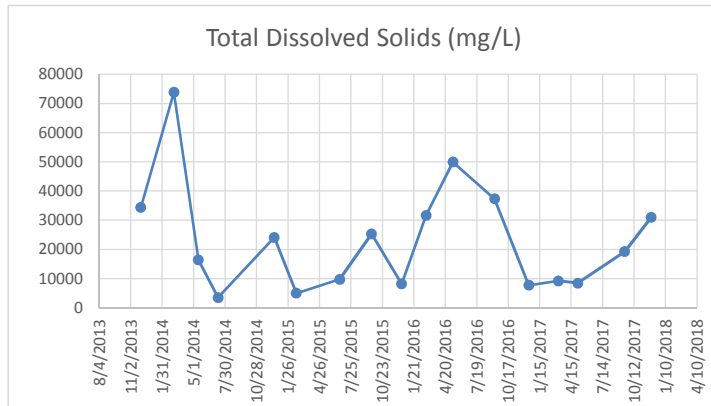
**APPENDIX 3b: 5-Year Summary of  
Water Quality Data  
2017 Annual Summary  
Lost Creek ISR Project 13-409**

Sample Name	Date	pH (s.u.)	Specific Cond. at 25°C (uS/cm)	Temp. (°C)	Specific Gravity	Total Dissolved Solids (mg/L)	Bicarbon ate (mg/L)	Carbonate (mg/L)	Chloride, Total (mg/L)	Sulfate, Total (mg/L)	Hydrogen Sulfide (mg/L)	Arsenic, Total (mg/L)	Selenium, Total (mg/L)	Vanadium, Total (mg/L)	Uranium, Total (mg/L)	Radium-226, Total (pCi/L)
DW-Injectate	12/1/2013	7.81	54632	18.77	1.025	34411									266.0	108
DW-Injectate	3/6/2014	6.36	108000		1.054	73800									69.2	480
DW-Injectate	5/15/2014	7.79	27200	17.00	1.010	16400	359	ND(5)	11300	496	0.01	0.028	0.287	ND(0.02)	134.0	12
DW-Injectate	7/10/2014	6.80	5310	19.20	1.002	3520	765	ND(5)	1150	519	ND(1)	0.002	0.108	ND(0.01)	23.4	2020
DW-Injectate	12/18/2014	6.92	37400	12.90	1.018	24100	488	ND(5)	13700	917	ND(1)	0.013	0.240	ND(0.02)	87.0	1980
DW-Injectate	2/19/2015	6.97	10270	11.80	1.003	4950	332	ND(5)		356	ND(1)	0.028	0.128	ND(0.01)	10.3	1040
DW-Injectate	6/23/2015	6.70	16400		1.007	9770	500		5410	786	ND(1)	0.007	0.211	ND(0.01)	22.7	1740
DW-Injectate	9/22/2015	6.51	19900	17.90	1.017	25300	279	ND(5)	16500	586	ND(1)	ND(0.01)	0.180	ND(0.09)	10.6	3320
DW-Injectate	12/17/2015	6.57	14650	12.90	1.005	8180	471	ND(5)	4280	609	ND(1)	0.008	0.157	0.03	5.2	722
DW-Injectate	2/25/2016	6.54	50400	15.90	1.023	31600	367	ND(5)	22300	1020	ND(1)	0.039	0.365	0.03	24.8	2970
DW-Injectate	5/12/2016	6.38	70700	18.50	1.033	49900	296	ND(5)	35000	1400	ND(1)	0.052	0.602	0.03	16.9	2530
DW-Injectate	9/8/2016	5.74	57700	20.00	1.030	37300	321	ND(5)	23200	1190	ND(1)	0.049	0.796	0.05	18.1	5300
DW-Injectate	12/15/2016	6.36	14090	12.80	1.006	7730	707	ND(5)	3610	875	ND(1)	0.010	0.170	ND(0.01)	4.3	2150
DDW-Injectate	3/9/2017	6.62	14890	14.0	1.007	9210	680	ND(5)	4560	830	3.0	0.002	0.265	ND(0.01)	6.3	1270
DDW-Injectate	5/4/2017	6.62	13260	14.0	1.000	8440	751	ND(5)	3970	1240	ND(1)	0.008	0.158	ND(0.01)	45.2	1610
DDW-Injectate	9/15/2017	7.18	29200	16.0	1.016	19200	929	ND(5)	10700	2220	ND(1)	0.022	0.136	ND(0.01)	137.0	1680
DDW-Injectate	11/30/2017	6.67	46300	17.0	1.026	31000	462	ND(5)	18300	2660	ND(0.04)	0.003	0.835	ND(0.01)	8.3	1280

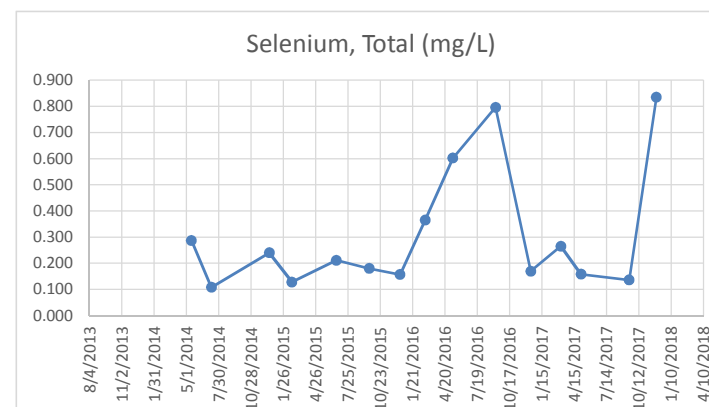
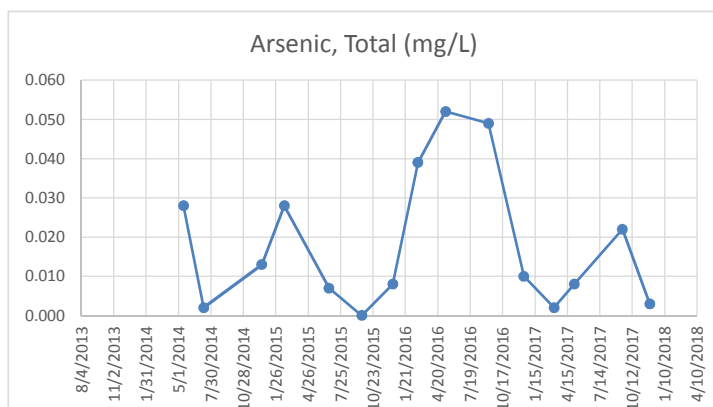
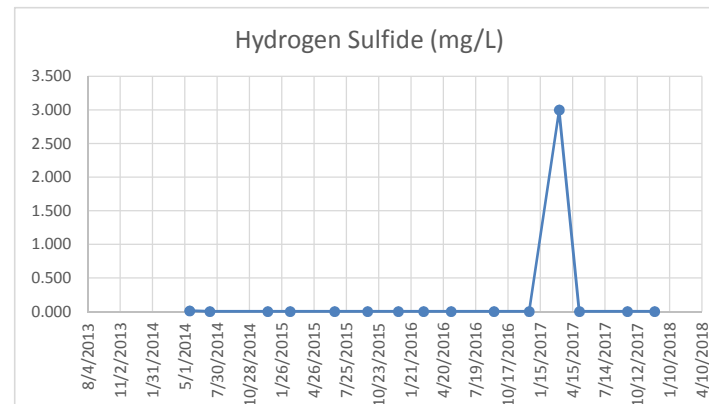
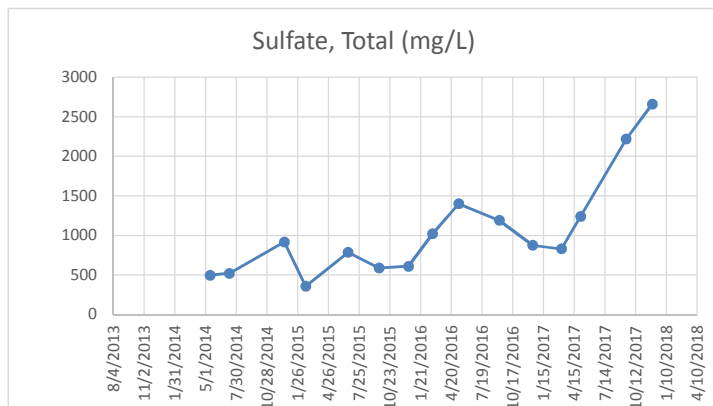
**APPENDIX 3b: 5-Year Summary of  
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