# 2018 Annual Groundwater Monitoring and Corrective Action Report

Scrubber Pond and Temporary Storage Area

Lewis & Clark Station Sidney, Montana

Prepared for Montana Dakota Utilities

January 2019



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### Acronyms

Acronym	Description
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
FGD	Flue-Gas Desulfurization
GCL	Geosynthetic Clay Liner
HDPE	High-Density Polyethylene
MDU	Montana Dakota Utilities Company
SSI	Statistically Significant Increase
TDS	Total Dissolved Solids
TSP	Temporary Storage Pad

### 1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates Lewis & Clark Station, a coal-fired generation unit near Sidney, Montana (Figure 1). Two coal combustion residuals (CCR) surface impoundments and a CCR pile, as defined by 40 CFR 257.53, are situated at the property. The surface impoundments are named the East and West Scrubber Ponds. The Scrubber Ponds are used to store sluiced flue-gas desulfurization (FGD) solids. The CCR pile is located on a temporary storage pad (TSP) where FGD solids (excavated from the Scrubber Ponds) are stored and allowed to dry prior to loading and hauling for disposal.

Closure by removal of CCR began at the TSP in 2018, which included removing all CCR and CCR-contaminated sediments from the TSP for disposal in an off-site landfill. Samples were collected from the base and sides of the excavation to verify that all CCR and CCR-contaminated sediments were removed. Although removal actions have been completed, demonstration that groundwater quality requirements of \$257.102(c) are ongoing.

A retrofit of the Scrubber Ponds was conducted in 2018 with an alternative composite liner system that covers all surrounding earth that otherwise would likely be in contact with CCR. The new liner system is an alternative composite liner, consisting of two layers of geosynthetic clay liner (GCL) overlain by a 60-mil high-density polyethylene (HDPE) geomembrane. The alternative composite liner is equivalent to the composite liner design requirements of §257.70(c) and §257.70(b)(1) through (4). The location of the Scrubber Ponds after the retrofit is shown on Figure 1.

The locations of the Scrubber Ponds and TSP are shown on Figure 1. The groundwater monitoring system is a multiunit groundwater monitoring system, as allowed in §257.91(d). This 2018 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Scrubber Ponds and TSP at MDU's Lewis & Clark Station (Site).

### 1.1 Purpose

As stated in Section §257.90(e), the purpose of the Annual Report is to:

- Document the status of monitoring and corrective action program for the CCR unit
- Summarize key actions completed
- Describe any problems encountered
- Discuss actions to resolve the problems
- Project key activities for the upcoming year

### 1.2 Status of the Groundwater Monitoring and Corrective Action Program

The 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area (Barr, 2018) documented the results of the baseline groundwater monitoring. The evaluation of groundwater monitoring data for statistically significant increases over background levels for the constituents listed in appendix III from the CCR Rule began on October 17, 2017 and continued in 2018.

Assessment monitoring was triggered because a statistically significant increase (SSI) over background levels was detected in detection monitoring for one or more of the constituents listed in appendix III to the CCR Rule (§257.95(a)) resulting from the fall 2017 monitoring event. The groundwater monitoring and corrective action program for the Scrubber Ponds and TSP has been in assessment monitoring for 2018. Additional information concerning the transition to assessment monitoring is provided in Section 2.0.

#### 1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of §257.90(e) of the CCR Rule, as outlined in the following Table 1.

Table 1 CCR Rule Requirements

<b>CCR Rule Reference</b>	Content Required in Report	Location
§257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation; see Figure 1
§257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§257.90(e)(3)	Provide the number and date groundwater samples were collected, and the monitoring data (i.e., detection or assessment)	Section 2.3 Monitoring and Analytical Results
§257.90(e)(4)	Discuss any transition between monitoring programs	Section 2.3 Transition to Assessment Monitoring
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Other information not required in this report

### 2.0 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR units for 2018. The groundwater monitoring system is described in Section 2.1, transition to assessment monitoring is described in Section 2.2, monitoring and analytical results are described in Section 2.3, key actions completed and problems encountered are described in Section 2.4, and key activities planned for 2019 are described in Section 2.5.

### 2.1 Groundwater Monitoring System

#### 2.1.1 Documentation

Figure 1 shows an aerial image of the CCR units and all background (or upgradient) and downgradient monitoring wells in the groundwater monitoring system, including the well identification numbers, that are part of the groundwater monitoring program, as required by §257.90(e)(1). Further details on the groundwater monitoring system for the CCR unit monitoring wells are included in Groundwater Monitoring System Certification, Lewis & Clark Station (Barr, 2018).

#### 2.1.2 Changes to Monitoring System

The Groundwater Monitoring System Certification, Lewis & Clark Station (Barr, 2018) documents the removal of monitoring well MW 102 from the monitoring well system and the addition of monitoring well MW 120 into the monitoring well system. Monitoring well MW 102 was removed from the system and abandoned due to location conflicts with construction at the CCR units conducted in 2018. New monitoring well MW 120 was constructed to replace MW 102.

### 2.2 Transition to Assessment Monitoring

SSIs over background for the following parameters were determined as a result of the October 2017 detection monitoring event:

- Total dissolved solids (TDS): monitoring wells MW 111, MW 117, and MW 118
- Fluoride: monitoring wells MW 111 and MW 118
- Boron, calcium, chloride, pH, and sulfate: monitoring wells MW 111 and MW 118

The monitoring program transitioned from detection monitoring to assessment monitoring in 2018 and notification was provided on MDU's publicly accessible CCR Rule website.

### 2.3 Monitoring and Analytical Results

Groundwater samples were collected and analyzed in 2018 for the constituents listed in appendices III and IV (Part 257) under the assessment monitoring program.

 A total of seven samples were collected from the CCR groundwater monitoring system and were analyzed for the constituents listed in appendices III and IV during the initial assessment monitoring event (May 29 and 30, and June 13 and 14, 2018) consistent with the requirements of §257.95(b). Additional groundwater and surface water samples, not required by the CCR Rule, were also collected from monitoring wells and surface water bodies that are not part of the CCR groundwater monitoring system.

- A total of seven samples were collected from the monitoring well system and were analyzed for
  the constituents listed in appendices III and IV, except for radium during the resample assessment
  monitoring event (August 21 and 22, and August 28, 2018) consistent with the requirements of
  §257.95(d)(1). Additional groundwater samples, not required by the CCR Rule, were also collected
  from monitoring wells not part of the monitoring well system.
- Monitoring wells MW 117 and MW 120, in which radium was detected in response to §257.95 (b) (the initial assessment monitoring event), were sampled for radium on October 30, 2018.

Sampling dates are reported on the field data sheets and analytical laboratory reports in Appendix A.

### 2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2018:

- Decommissioned monitoring well MW 102 and installed monitoring well MW 120
- Assessment monitoring was conducted throughout 2018

Monitoring well MW 117 required rehabilitation. The riser pipe at this monitoring well was inadvertently unscrewed during groundwater sampling, which allowed sand pack material to enter the monitoring well. The sand was evacuated from the monitoring well and no issues have been reported since then.

An obstruction was reported within monitoring well MW 110. Subsequently, the monitoring well was inspected with a water-resistant camera. No obstructions or damage within the monitoring well was observed and the monitoring well was later sampled with no issue.

No other problems were encountered.

### 2.5 Key Activities for Upcoming Year

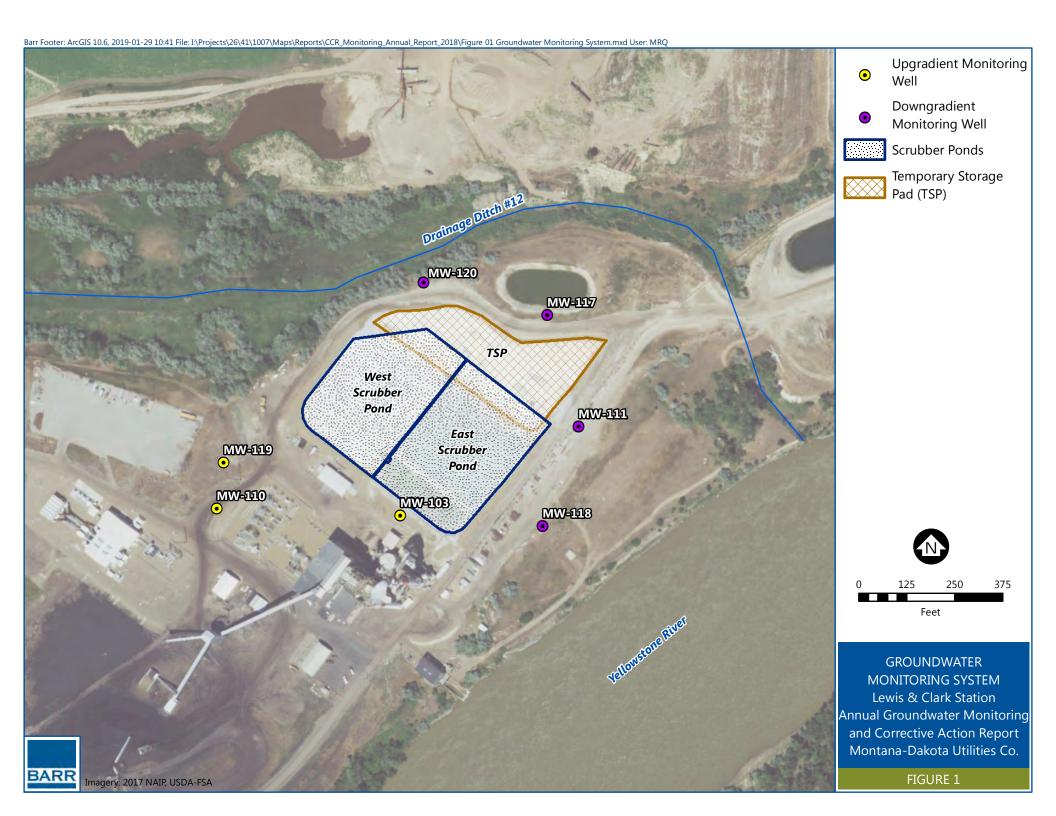
The following key groundwater monitoring program activities are planned for 2019:

- Continue the groundwater monitoring program in accordance with the CCR rule
- Evaluate analytical results from monitoring events for SSIs according to the Statistical Method Selection Certification (Barr, 2017)

### 3.0 References

- Barr, 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report, Scrubber Pond and Temporary Storage Area, Prepared for Montana Dakota Utilities Company. January 2018.
- Barr, 2018. Groundwater Monitoring System Certification, Prepared for Montana Dakota Utilities Company. November 2018.
- Barr, 2017. Statistical Method Selection Certification, Prepared for Montana Dakota Utilities Company. October 2017.

# **Figures**



# **Appendices**

# Appendix A

**Laboratory Reports and Field Sheets** 



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



August 15, 2018 - Amended Field Letter

Montana Dakota Utilities Attn: Samantha Marshall 5181 Southgate Dr. Billings, MT 59102

RE: Groundwater Sampling Event - 2018 at MDU Lewis & Clark Site

Dear Ms. Marshall:

Per email dated 26 July 2018 from Terri Olson, Barr Engineering, it was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the corrected Field Data Report. At well MW108 only a partial sample was collected due to insufficient recharge of the well to collect the full bottle set.

Per email dated 8 Aug 2018 from Terri Olson, Barr Engineering, it was noted that there still existed some confusion regarding the samples used as duplicate samples. Duplicate samples were collected from wells MW106 and MW118.

Thank you for your trust and support of our services. If you have any questions, please call me at (701) 391-4900.

Sincerely,

Claudette Cant Ser Jeremy Meyer MVTL Field Services 15Ag 18



**MDU** Lewis and Clark

**CCR** Sampling

Attn: Samantha Marshall

5181 Southgate Dr. Billings, MT 59102

WO# 82-1191

		START		TIME	WATER	WATER	10 Man			FIELD R	ADINGS			
WELL ID	PURGE DATE	PURGE TIME	SAMPLE DATE	OF SAMPLE	LEVEL START (FT)	LEVEL END (FT)	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	рН	<b>Turb.</b> NTU	SAMPLE APPEARANCE OR COMMENT	
MW101	30-May-18	13:31	30-May-18	14:16	9.01	9.51	4500.0*	Bladder	14.88	1266	7.39	2.21	clear	
MW105	30-May-18	15:57	30-May-18	17:27	8.80	NR	9000.0	Bladder	11.77	1644	7.32	8.09	clear	
MW106	30-May-18	18:03	30-May-18	18:58	9.51	9.65	5500.0*	Bladder	13.80	2669	7.42	2.26	clear	
MVV107	30-May-18	11:10	30-May-18	12:55	4.30	5.98	10500.0	Bladder	9.85	1378	7.36	143.00	slightly turbid	
MW108	31-May-18	7:27	31-May-18	11:19	16.82	NR	3700.0	Bladder	14.25	5368	6.83	160.00	slightly turbid	
MW109	30-May-18	14:52	30-May-18	15:27	10.37	10.48	3500.0	Bladder	14.66	1669	7.32	2.47	clear	
MW116	31-May-18	8:11	31-May-18	10:26	10.72	NR	13500.0	Bladder	12.14	2469	7.40	19.20	clear	
MW210	NA	NA	29-May-18		9.15	NA	NA	Na	NA	NA	NA	NA	Water Level Only	
	NR= Not Recorded on Field Sheet NA = Not Applicable													



### **MDU Lewis and Clark**

CCR Sampling

Attr

Attn: Samantha Marshall

5181 Southgate Dr. Billings, MT 59102

WO# 82-1193

\_1101

82-1392

82-1191

		START		TIME	WATER	WATER				FIELD RI	EADINGS		
WELL ID	PURGE DATE	PURGE TIME	SAMPLE DATE	OF SAMPLE	LEVEL START (FT)	LEVEL END (FT)	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	рН	<b>Turb.</b> NTU	SAMPLE APPEARANCE OR COMMENT
MW103	29-May-18	14:04	29-May-18	14:54	10.50	10.54	5000.0	Bladder	12.78	1476	7.33	3.57	clear
MW110	13-Jun-18	12:12	13-Jun-18	15:12	8.80	9.01	18000.0	Bladder	15.61	1031	7.33	4.78	clear
MW119	29-May-18	12:08	29-May-18	12:58	8.83	8.90	5000.0	Bladder	10.63	1118	7.34	1.88	clear
MW111	29-May-18	16:19	29-May-18	17:29	7.91	7.95	7000.0	Bladder	12.71	2997	7.24	1.15	clear
MW117	13 jue 18	16:14	14-Jun-18	6:17	5.85	below pump	4000.0	Bladder	9.85	8475	7.24	4.41	clear
MW118	30-May-18	7:40	30-May-18	8:35	8.61	8.59	5500.0	Bladder	12.77	1574	7.45	2.61	clear
MW120	29-May-18	18:34	29-May-18	19:14	15.26	15.93	4000.0	Bladder	9.89	3761	6.88	1.41	clear
West Scrubber	NA	NA	30-May-18	11:05	NA	NA	NA	Grab	NA	NA	NA	NA	Dry
Sewage Lagoon	NA	NA	31-May-18	8:35	NA	NA	NA	Grab	20.29	3552	7.89	35.90	slightly turbid
SP1	NA	NA	30-May-18	10:35	NA	NA	NA	Grab	17.73	789	7.87	174.00	slightly turbid
SP2	NA	NA	30-May-18	10:56	NA	NA	NA	Grab	17.77	793	7.78	399.00	turbid
	<u> </u>	•		***************************************	- Not Poser	dod on Field	Sheet NA = Na	ot Applicable					

NR= Not Recorded on Field Sheet NA = Not Applicable



**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	103
Sampling Personal:	De oca Willer

sec.

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

	( /												in-		
Weather C	onditions:		Temp:	171	°F	Wind:	South	@ 5		Precip:	Sunr	y Partly C	loudy / CI	oudy	
		Well Info	ormation						Sa	ampling I	nformatio	on			
Well Locked? Yes (No							Purgir	ng Method:	Blac	dder					
Wel	I Labeled?						<del></del>	ng Method:	Blac	Bladder			Control Settings		
Casing	g Straight?	XES	No				Dedicat	ed Equip?:	Yes	(No)			5		
Grout S	eal Intact?	Yes	No	Not V	/isible		Duplicate	Sample?:	Yes	(Ño)		Recover:	55		
Repairs Ne	cessary:						Duplicate :	Sample ID:	1-4-17-17-1			PSI:			
	Casing	g Diameter:		2"											
Wate	er Level Bet	fore Purge:		0.50	, ft		Р	urge Date:	29 Ma	4 18		ing Began:	1409	am	
							Well P	urged Dry?	Yes 4	NO		urged Dry:		am	
							Sa	mple Date:	29 May	18	Time of	Sampling:	1454	am	
Ι	Depth to To	p of Pump:		8,44	ft					<i>U</i>					
Wate	er Level Aft	er Sample:	j	0154	ft		Bottle	1L Raw	500ml	_ Nitric	500mL Niti	ric (filtered)	250 S	Sulfuric	
IV.	/leasureme	nt Method:	Electric	Water Level	Indicator		List:				4 - 1L Nitric				
					Eiold	Measure	monte								
Stabili	zation	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL		Description:		1	
1	ecutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	I .	, Color, Odd			
SEQ#	Time	<u> </u>	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min			Slightly Turbid,		]	
1	1400	14,39	4225	7.31	0,207	76.4	37.5	10,5%	tpe	500	Slight.	rtwibid			
2	1474	13,01	B2163	7,33	0,21	77.8	27:7	10,55	100	1500	57				
3	1439	13.23	15207	7,33	0,24	73.6	4.62	10,55	100	1500	clea				
4	1444	13,32	1512	7,33	0,20	74.1	3,53	10155	100	500	dea				
5	1449	12,94	1492	7,35	6.19	75,3	3,73	10,55	100	500	Clear				
6	1454	12,78	1476	7,33	0119	77,3	3,57	10.55	100	500	Clear				
7														4	
8														-	
9														4	
10											<u> </u>			]	
Stabilized:	Yes /	No	-				Т	otal Volum	e Removed:	5 000	_mL				
Comments	) k														



Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	MW 110

	Assess	ment		Sample ID:	$\sim$	W 110							
2616 E. Broadway Ave, Bi	ismarck, ND							Sampling F	Personal:	Darren	Niesu		
Phone: (701) 258-9	9720									<i>y</i> - 0. <i>y</i> - 0.0 1			2
Weather Conditions:		Temp:	70 °F	· - · · · · · · · · · · · · · · · · · ·	Wind:	Light	- @		Preci	o: <b>Sunr</b>	y Partly C	loudy / Cl	oudy
	Well Info	ormation		, , , , , , , , , , , , , , , , , , , ,				Sa	ampling	Informatio	on		
Well Locked?	Yes	No				Purg	ing Method:	Blac	dder				
Well Labeled?	Xes	No				Sampi	ing Method:	Blac	dder		Coi	ntrol Settin	gs
Casing Straight?	Yes	No			:	Dedica	ted Equip?:	Yes	No	1.8g.	Purge:	·	sec.
Grout Seal Intact?	(Yes	No	No Not Visible			Duplicate	e Sample?:	Yes	No		Recover:		sec.
Repairs Necessary:						Duplicate	Sample ID:				PSI:		
Casing	Diameter:		2"										
Water Level Bef	fore Purge:	4	9.04	ft			Purge Date:			Time Purg	ing Began:		am/pm
						Well F	Purged Dry?	Yes	No	Time P	urged Dry:		am/pm
						Sa	ample Date:	29May	18	Time of	Sampling:	1400	am/pm
Depth to Top	p of Pump:			ft									
Water Level After	er Sample:			ft		Bottle	1L Raw	500ml	_Nitric	500mL Nitt	ic (filtered)	250 S	ulfuric
Measuremer	nt Method:	Electric	Water Level Indi	cator		List:				4 1L Nitric	9		
				Field	Measure	ements				3			
0	Tomn	Cnoo		<u> </u>		T	. 18/-4	B	T				ı

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed	Description: Clarity, Color, Odor, Ect.
SEQ#	Time	-	±5%	±0.1	±10%	±20 mV	±10%				Clear, Slightly Turbid, Turbid
1											
2											
3				<u> </u>							
4											
5											Al-Control of the Control of the Con
6											
7											
8								/			
9			STATE OF THE PARTY								
10											
Stabilized:	Yes	No					T	otal Volume	e Removed:	<u> </u>	mL

Total Volume Removed: mL

Comments:

Went to put pump down the well and there is an obstruction around 9,10 just below water level, bounced the pump to try to get by, but it want go past.



**Groundwater Assessment** 

Company:	N	IDU Lewis and Clark	
Event:		Spring 2018	
Sample ID:	119		
Sampling Personal:	Daccen	Nilsvaas	

			Cicuii	uvvatei	A33633	mem	Sample ID.						
2616 E. Broadway Ave, Bis	smarck, ND							Sampling P	ersonal:	Darren	Niess	rac-6	
Phone: (701) 258-9	720									<del>Varian</del>			
Weather Conditions:		Temp:	66°F		Wind:	Light @	<u> </u>	***************************************	Precip:	Sunr	ny /(Partly C	Cloudy / Clo	udy
,	Well Info	rmation	<del></del>					Sa	· · · · · · · · · · · · · · · · · · ·	nformatio			
Well Locked?	Yes	No				Purging	Method:	Blac	lder		·····		
Well Labeled?	(Yes)	No				Sampling	Method:	Blac	lder		Co	ntrol Setting	 js
Casing Straight?	Xes)	No				Dedicated	d Equip?:	Yes	No		Purge:	5	sec
Grout Seal Intact?	(Yes	No	Not Visi	ble		Duplicate S	ample?:	Yes	(No)		Recover:	55	sec
Repairs Necessary:						Duplicate Sa	ample ID:				PSI:		
Casing	Diameter:		2"							-			
Water Level Befo	ore Purge:	- 8	83	ft		Pur	rge Date:	74Ma	418	Time Purg	ing Began:	1208	am/øn
		U				Well Purg	ged Dry?	Yes	(No)		urged Dry:		<del>am/pn</del>
						Sam	ple Date:	29 May	118	Time of	Sampling:	1258	am/pn
Depth to Top	of Pump:	14	34	· ft				/					
Water Level Afte	8,90	ft		Bottle	1L Raw	500ml	Nitric	500mL Niti	ric (filtered)	250 Su	ılfuric		
Measurement Method: Electric Water Level Indicator						List:				4 - 1L Nitric			
				Field	Measure	ements							
	Tomn	Cncc		DO I			18/-4	I Danier III -	r	1			

	r leid Weastreffields												
Stabil	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:		
(3 cons	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	aml/min		Clear, Slightly Turbid, Turbid		
1	1213	11.98	1116	7,33	1,78	95,3	4.57	8,90	1500i00	500	Clear		
2	1228	11,01	1111	734	0.74	81.L	4.80	8,90	100	1500	clea/		
3	1233	10,79	1112	7.34	0,18	80.4	5.40	8,90	100	500	clear		
4	1243	10.86	1116	7.34	0,89	18,4	3048	8090	100	1000	clean		
5	1248	10.80	1119	7.33	0294	タグラ	2.04	8,90	100	500	C(40-		
6	1253	10.86	1119	7.34	0.93	77.3	1.93	8,90	100	500	the-		
7	1258	10.63	1118	7,34	0.98	76.6	1,88	8,90	100	500	clear		
8				Ì						-			
9													
10													

Stabilized: Yes No
Comments: \* 24Ma 18 0 A

Total Volume Removed: 5000 mL



Groundwater Assessment

Company:		MDU Lewis and Clark	
Event:		Spring 2018	•
Sample ID:	111		
Sampling Personal:	160-00	11:00	

				010	anawate,	A33633	Helit	Sample 1D.						
2616 E. Bro	oadway Ave, B	ismarck, ND							Sampling P	ersonal: 🛭	Tarren N	les wan	a ·	
Pho	ne: (701) 258-	9720								\$4		/	<u></u>	
<b>N</b> eather C	Conditions:		Temp:	75	°F	Wind: /	right	@		Precip:	Sunr	y Partly C	loudy / Clo	udy
		Well Info	ormation						Sa	ımpling l	nformatic			
W	ell Locked?	Yes (	(No)				Purgii	ng Method:	Blac	lder				
We	ll Labeled?	(Fig.)	No				Sampli	ng Method:	Blac	lder	[	Co	ntrol Setting	js
Casin	g Straight?	(Ves)	No				Dedicat	ted Equip?:	Yes	<b>1</b>		Purge:	5	se
Grout S	Seal Intact?	¥es	No	Not \	/isible		Duplicate	Sample?:	Yes	<b>(</b> 6)		Recover:	55-	se
Repairs N	ecessary:						Duplicate	Sample ID:	**************************************	-		PSI:	_	
	Casing	Diameter:		2"										
Wat	er Level Bet	fore Purge:	-7	(9)	ft		F	Purge Date:	29 May	18	Time Purgi	ing Began:	1619	am/pfi
							Well P	urged Dry?		No)	Time P	urged Dry:		—am/pi
							Sa	mple Date:	29 Mar.	V 18	Time of	Sampling:	1729	am/gi
	Depth to To	p of Pump:	14	176	ft				•	<del>,                                    </del>			τ	
Wat	er Level Aft	er Sample:	-7	.95	ft		Bottle	1L Raw	500mL	. Nitric	500mL Nitr	ic (filtered)	250 St	ılfuric
7	Measuremer	nt Method:	Electric '	Water Level	Indicator		List:				4 - 1L Nitric			
					Field	Measure	ments							
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	]	Description:		
	(3 consecutive) (°C)			pΗ	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	1	Color, Odo	r, Ect.	
SEQ#	Time	-	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, S	Slightly Turbid,	Turbid	
1	1624	13.42	2930	17.04	D. 34	781	5,73	7.98	IPD	CDO	0/00			

						modeare					
Stabilization		Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	ΡΗ	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1624	13.42	3930	17.04	0,34	78.6	5,73	7.98	100	500	Clean
2	1639	12.95	3750	7.07	0.30	74.0	18.3	7,94	100	1500	clear
3	1649	12.80	3457	4.12	0,68	173,6	12.62	7.95	100	1000	cles-
4	1704	12,31	3129	7.21	1,70	73,8	4.81	7,94	100	1500	clear
5	1714	12,38	3048	7.23	2,40	74.0	3.29	7.95	100	1000.	Clean
6	1719	12,19	3013	7,24	2,24	74.3	1.24	7,95	100	500	Clean
7	1724	12,56	1995	7,25	2.81	74,3	1.15	7.95	100	500	Class
8	1729	12.71	29907	7,24	2,91	74,4	1.15	7.95	100	500	clear
9	, , , ,	,,,,			,		1 7 7		i		,
10											
	//>									~ ~ ~	

Total Volume Removed: 7000 mL



**Groundwater Assessment** 

Company:		MDU Lewis and Clark
Event:		Spring 2018
Sample ID:	117	
Sampling Personal:	Parren	Nicswaag

2616 E. Broadway Ave, Bismarck,	ND
Dharas (704) 858 8788	

Weather C	Conditions	:	Temp:	75	°F	Wind:	Light	· @		Precip	SIII	Partly C	loudy / Cl	oudy
		Well Info	ormation						Sa	ampling I	nformati	on		
We	ell Locked?	Yes	/No)			]	Purgi	ing Method:	T	dder				
We	ll Labeled?	∦(es)	No					ing Method:	<del> </del>	der		Co	ntrol Settin	as _
Casin	g Straight?	TOS	No			İ		ted Equip?:	Yes	No		Purge:		se
Grout S	Seal Intact?	Yes	No	Not '	Visible		Duplicate	Sample?:	Yes	No		Recover:		se
Repairs No	ecessary:						Duplicate	Sample ID:				PSI;		
10 Age	Casin	g Diameter:		2"				<b>\</b>		· · · · · · · · · · · · · · · · · · ·	-	٢		
Wat	er Level Be	fore Purge:			ft			Purge Date:			Time Purg	ging Began:		am/p
				/			Well F	urged Dry?	Yes	No	Time F	Purged Dry:		am/p
							Sa	ample Date:	29 May	18	Time o	f Sampling:	1610	am/p∕
]	Depth to To	op of Pump:			ft									
Wat	er Level Af	ter Sample:			ft		Bottle	1L Raw	500ml	_ Nitric	500mL Nit	tric (filtered)	250 S	ulfuric
<u> </u>	Measureme	nt Method:	Electric '	Water Leve	l Indicator		List:				4 - 1L Nitrio	>		
					C: alal	N/ · · · ·								
Stabil	lization	Temp	Spec.		DO	Measure ORP	Turbidity	Water	Dumning	Τ ,	1	D		1
	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Pumping Rate	mL Removed	1	Description: /, Color, Odo		
SEQ#	Time	( )	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min	Kemoveu	<del> </del>	Slightly Turbid,	<u> </u>	
1														
2														
3														
4														
5														
6														
7														
8							:					***************************************		
9		<del>  /                                   </del>					<u> </u>							
	Yes	N-			1				L		L			
Stabilized:	165	No		,				otal Volum	e Removed:		_mL		^ ^ k	60-
Comments	s. wh	en tryi	ing to g	et th	e cap	off a	- Section	not	Pipe C	ame u	p abou	NYA Z4	CA SCOTO	2
	أأيس		, ,	34		/ (	1	Ci .	e )	۸	/	. A.		
	The	Chp was	S ON re	eally t	Tight, 1	eplaced	r cap o	The g	and ar	round	YM P	ita 24 Tre fe	a into	
	the	well a	. / . / .	الما		-		,			·			
	,	1 ( N)	IN PINA	C1 1'1										



**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	
Sampling Personal:	Nicharage

	Grou
2616 E. Broadway Ave, Bismarck, ND	
Phone: (701) 258-9720	

Veather C	onditions:		Temp:	62	°F	Wind:	North	<u>@ 6</u>		Precip:	Sunr	ny / Partly Cl	oudy(//Clc	udy \
		Well Info	ormation						Sa	ampling l	nformatio	on		
We	ell Locked?	Yes	(No)				Purgii	ng Method:	Blac					
We	ll Labeled?	Yes	No				Samplii	ng Method:	Blac	lder		Cor	trol Setting	 js
Casin	g Straight?	Yes	No					ted Equip?:	Yes	No		Purge: 5	<u> </u>	se
Grout S	eal Intact?	Yes	No	Not \	/isible		Duplicate	Sample?:	Xes)	No		Recover:	55	se
Repairs Ne	ecessary:						Duplicate	Sample ID:	Duso	/		PSI:		
	Casing	Diameter:		2"					7					
Wate	er Level Bet	fore Purge:		8.61	ft		F	urge Date:	30Me	1/18	Time Purg	ing Began: (	5740	am/p
	`						Well P	urged Dry?	Yes	′_√Nø	Time P	urged Dry:		am/p
							Sa	mple Date:	30May	18	Time of	Sampling:	0835	am/p
. [	Depth to To	p of Pump:	9,8	80	ft						(7)			
Wat	er Level Aft	er Sample:	8.5	59	ft		Bottle /	1L Raw	500mL (	₋ Nitric) Հ	500mL Niti	ric (filtered)	250 St	ılfuric ,
N	/leasuremer	nt Method:	Electric \	Water Level	Indicator		List: \	2/	\ 2		- 1L Nitric	<i>)</i>	2	
					<b>-</b> *		4							
		T	C	T	DO	Measure		18/-4	D	ı				
	ization · ecutive)	Temp (°C)	Spec. Cond.	рН	(mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	Pumping Rate	mL Removed		Description: , Color, Odor	Fct	
SEQ#	Time	( 0)	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	mi/min	Kemoveu		Slightly Turbid,		
1	0745	13,90	1571	7.38	1771	64,2	300	8.59	100	500	Twb			
2	n815	12,91	15-71	3,44	64.78	61,4	6.92	8.58	100	3 000	clea			
3	5825	13.05	1572	7.45	4.65	60,9	2,89	8,58	100	1000	class			
4	0830	12.65	1570	7,45	4.62	6016	2,76	8158	100	500	de			
5	0835	12,77	1574	7,45	4,66	6015	2,61	8.58	100	500	clean			
6		•												
7														
8														
9							<u> </u>							
10					<u> </u>		<u> </u>							
Stabilized:	<del></del>	No	-				Т	otal Volum	e Removed:	\$550U	'mL			
Comments	s: 🔾													



#### **Groundwater Assessment**

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	120	
Sampling Personal:	0 00 000	

Phone: (701) 258-9720

Weather Co	onditions:		Temp:	75	°F	Wind:	Light	@		Precip:	Sunn	y Partly C	loudy / Cl	oudy
		Well Info	·				Sampling Information							
Wel	li Locked?	Yes	No				Purgir	ng Method:	Blad	der				
	Labeled?	Yes	No	<u> </u>			Samplir	ng Method:	Blad	der		Co	ntrol Settin	gs
	Straight?	Yes	No				Dedicat	ed Equip?:	Yes	No		Purge:	5	sec.
	eal Intact?	Yes	No	(Not \	/isible		Duplicate	Sample?:	Yes	(No		Recover:	55	sec.
Repairs Ne				· · · · · · · · · · · · · · · · · · ·			Duplicate \$	Sample ID:				PSI:		
		Diameter:		2"										
Wate		ore Purge:	)	5.26	ft		Р	urge Date:	29Ma	Y18	Time Purg	ing Began:	1834	am/pm
	Peath o	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	· ·	8,85			Well Pi	urged Dry?	Yes '	No		urged Dry:		am/pm
	F C 7 ) - 1 C			0 - 0 - 2			Sa	mple Date:	29 May	18	Time of	Sampling:	1914	am/pm
D	epth to To	p of Pump:	)	6.60	ft				· · ·					
		er Sample:	j	5,93	ft		Bottle	1L Raw	500mL	Nitric	500mL Niti	ic (filtered)	250 S	ulfuric
M	easuremer	nt Method:	Electric '	Water Level	Indicator		List:			•	4 - 1L Nitric			
		<b>-</b>		T	DO	Measure ORP	Turbidity	Water	Pumping	mL		Description:		]
Stabiliz		Temp (°C)	Spec. Cond.	pH	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Odd		
(3 conse	Time	( 0)	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min			Slightly Turbid,		
1	1839	11/4	2821	6.91		92.3	13.2	15,41	100	500	Clean			
2	10119	10,55	3/3/3	6.90	0.46	80.4	5.84	15.52	100	1000	C/lea			
3	19854	10,33	369a	6.89	0,20	79,1	2,179	15,60	100	1000	Chen			
4	1904	10,42	3695	6,08	0,32	7815	1.33	15.62	joo	500	Clear	-		
5	1909	10,31	3718	6,88	0,36	77.9	1,40	15,65	100	500	clea	<u> </u>		_
6	1914	9.89	3761	6.88	0,40	776	1,41	15.66	100	500	Clan			
7		, , ,		,00										
8														-
9														-
10									<u> </u>	1/222				1
Stabilized:	Yes	No	_				Т	otal Volum	e Removed:	4000	_mL			
Comments														



**Groundwater Assessment** 

Company:	MDU Lewis and Clark	
Event:	Spring 2018	-
Sample ID:	101	
Sampling Personal:	Darrin Niegalling	

2616 E. Broa	adway Ave, Bi	ismarck, ND							Sampling P	ersonal:	Darren 1	1/120	Vaag	
Phon	ne: (701) 258-9	9720												
Weather C	onditions:		Temp:	74	°F	Wind:	Light	@		Precip:	Sunny/ F	artly CI	oudy / Clo	oudy
		Well Info	rmation						Sa	mpling l	nformation			
We	ll Locked?	Yes	No				Purgii	ng Method:	Blad	der				
Wel	l Labeled?	Yes	No				Sampli	ng Method:	Blac	der		Con	trol Setting	gs
Casing	g Straight?	Des	No		_		Dedicat	ed Equip?:	Yes	No		Purge:	5	se
Grout S	eal Intact?	Yes	No	(Not V	<u>'isible</u> '		Duplicate	Sample?:	Yes	NO	R	ècover:	55	se
Repairs Ne	cessary:						Duplicate	Sample ID:				PSI:		
	Casing	Diameter:		2"										
Wate	er Level Bef	fore Purge:	(	9.01	ft		F	Purge Date:	30 Mar	v18	Time Purging E	3egan:	<u> 1331                                  </u>	am/g
							Well P	urged Dry?	Yes '	(No	Time Purge	∍d Dry:	· · · · · · · · · · · · · · · · · · ·	am/p
		-					Sa	mple Date:	30 Mars	11/	Time of Sar	npling:	1416	am/p
	Depth to Top	p of Pump:	0	15 (	ft					ė.				
Wate	er Level Aft	er Sample:	9,		o∱ ft		Bottle	1L Raw	500mL	. Nitric	500mL Nitric (f	iltered)	250 St	ulfuric
M	1easuremer	nt Method:	Electric \	Nater Level	Indicator		List:							
					Field	Measure	ements							
Stabili	zation	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	1	cription:		ı
,	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Co			r
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slight	ly Turbid, T	urbid	l

Stabil	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1336	14,69	1310	7,44	4,36	51,4	11.6	9,41	100	500	clean
2	1351	15,57	12.70	7,40	3,63	51,4	12,4	9,517%	100	1500	ckar
3	1401	14,80	1268	7.40	4.27	52,2	2.81	9,51	100	1000	clear
4	1406	14.96	1267	7.40	4.18	526	219	9,51	100	500	Clear
5	1411	14,53	1268	1240	4.18	52.8	2.05	9,51	100	500	Chear
6	14/1	14.88	1266	1.39	4,08	530	2,21	9.51	100	500	Clar
7	, , ,		•	110.							
8											
9											
10	1/										

Stabilized: Yes No
Comments:

Total Volume Removed: 3500 mL



**Groundwater Assessment** 

MDU Lewis and Clark
Spring 2018
105
My Nieswars

sec sec.

557 am/pm

250 Sulfuric

2 Fam/pm

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9	9720										<b></b>	
Weather Conditions:		Temp:	80	°F	Wind:	Light	@		Precip:	Sunn	y Partly C	Cloudy / Cloudy
	Well Info	rmation	0			<del></del>		Sa	ampling Ir	ıfo <del>rm</del> atio	n	,
Well Locked?	Yes	(No				Purgir	ng Method:	Blac	der			
Well Labeled?	(Yes)	No				Samplin	ng Method:	Blac	ider		Co	ntrol Settings
Casing Straight?	Yes	No				Dedicat	ed Equip?:	Yes	<b>₫</b> Ø		Purge:	5
Grout Seal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	₩6		Recover:	515
Repairs Necessary:						Duplicate:	Sample ID:				PSI:	
Casing	Diameter:		2"									
Water Level Bef	fore Purge:		8 a S C	2 ft		F	urge Date:	30 ma	×18	Time Purgi	ng Began:	1557- a
			0 "			Well P	urged Dry?	Yes	(No	Time Pı	urged Dry:	a
						Sa	mple Date:	30 Ma	518	Time of	Sampling:	1727a
Depth to To	p of Pump:		16.20	ft				,	/			
Water Level Aft	er Sample:			ft		Bottle	1L Raw	500mL	_ Nitric	500mL Nitri	c (filtered)	250 Sulfuri
Measuremer	nt Method:	Electric	Water Level	Indicator		List:						
		-		Field	Measure	ements						
Stabilization	Temn	Snec	T	DO	ORP	Turbidity	Water	Pumping	ml	Г	escription:	

					I ICIG	Measure	11101163				
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1602	13.20	8425	7,22	0.73	56,8	553	8,86	100	500	Trsix
2	1/432	12 23	2031	7,32	0.86	49.9	15.5	8.85	100	3000	Clear
3	16407	12,02	1750	7,32	1,00	49,3	14,9	8,89	100	1500	Clear
4	14507		1714	7,32	0,91	4910	1601	8185	700	(000)	Clean
5	1702	12.55	1694	7.32	1,00	49.0	10,2	8.85	100	500	der
6	1717	-11,61	1642	7.32	1001	49.0	8,52	8185	100	1500	clear
7	1722	11,67	164 7	7.32	1,00	48.9	8,26	8,85	100	500	Clear
8	1727		1644	7.32	-1,00	48,3	8209	8.85	700	500	Clean
9						•			1		
10											
Stabilized:	: \\ Yes\	No					Т	otal Volume	e Removed:	9000	mL

Stabilized: \\ Yes Comments:



**Groundwater Assessment** 

Company:	M	DU Lewis and Clark	
Event:		Spring 2018	*
Sample ID:	106		
Sampling Personal:	Parsen	Nieswang	

Phone: (701) 258-9720

				~								>		
Weather C	onditions:		Temp:	80	°F	Wind: /	Light	@		Precip:	Sunr	y Partly C	loudy / Clo	ıdy
		Well Info	rmation						Sa	mpling li	nformatio	on		
We	ell Locked?	Yes	<b>X</b> 6				Purgir	ng Method:	Blad	der				
	Il Labeled?	Yes	No					ng Method:	Blad	der		Co	ntrol Setting	s
	g Straight?	Yes	No					ed Equip?:	Yes	NO)		Purge:		sec.
	Seal Intact?	Yes	No	Not V	isible		Duplicate		Yes	No		Recover:	55	sec.
Repairs Ne							Duplicate S		Dun S	2		PSI:	20	
r topallo i tt		Diameter:		2"					belp	,				
Wate	er Level Bef		C	7.51	ft		P	urge Date:	30 May	18		ing Began:	1803	am/pm
				1.19.			Well Pi	urged Dry?	´ Yes´,	(No)	Time F	ourged Dry:	•	am/pm
							Sa	mple Date:	30 May 6	18	Time of	f Sampling:	1850	am/pm
	Depth to To	p of Pump:	18	0,90	ft				, ,				~	
Wat	er Level Aft	er Sample:	16	7.65	ft	Ģ	Bottle	1L Raw	500mL	Nitric	500mL Nit	ric (filtered)	250 Su	furic
Ŋ	Measuremei	nt Method:	Electric '	Water Level	Indicator	,	List:							
					Ciold	Measure	monte							
		Toma	Snoo		DO	ORP	Turbidity	Water	Pumping	mL		Description		
1	lization	Temp (°C)	Spec. Cond.	pH	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Ode		
SEQ#	secutive) Time	( 0)	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min	Ttemotou		Slightly Turbid		
1	1808	15.01	3140	7.38	7 27-	31,7	225	964	100	500	Clea	, _		
2	1823	14,26	2681	7.43	5,38	47.6	8056	9.62	100	1500	Chro			
3	11638	14.09	2675	7.43	8,40	49,0	3,57	9.66	100	1500	die			
4	1843	14,29	2674	7,43	5.40	49,2	2,75	9,67	100	500.	1/20	//		
5	1848	14,46	7/69	7.42	6.60	49,3	12,407	9.66	100	500	Clear			
6	1853	13,44	26607	7,42	5,62	49,9	2,34	9,66	100	500	chea	<u> </u>		
7	1458	13,80	2649	7,42	5,53	50,2	2,26	9,65	100	500	de			
8	1000													
9														
10		\												
Stabilized	: /Yes	/ No	<del>-</del>				Т	otal Volum	e Removed:	5000	_mL			
Comment	s/( /	/												



**Groundwater Assessment** 

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	MWIOT	
Sampling Person	nal: De core Allecia Mac	

Db---- (704) 050 0700

Phor	ne: (701) 258-9	9720												
Weather C	onditions:		Temp:	68	°F	Wind:	Light			Precip:	Sunr	y Partly C	Cloudy / Cl	oudy
		Well Info	rmation				J		Sa	mpling l	nformatio	on		
We	ell Locked?	Yes	(No)				Purgii	ng Method:	Blad	der				
Wel	ll Labeled?	Yes)	Ňo				Sampli	ng Method:	Blad	der		Co	ntrol Settin	gs
Casin	g Straight?	Xes	No				Dedicat	ed Equip?:	Yes	(No)		Purge:	<u>5</u>	sec.
Grout S	Seal Intact?	Yes	No	Not V	'isible		Duplicate	Sample?:	Yes	∠No>		Recover:	55	sec.
Repairs Ne	ecessary:						Duplicate	Sample ID:		<u></u>		PSI:	<i>~</i>	
	Casing	g Diameter:		2"									0	
Wate	er Level Bet	fore Purge:	4,	30	ft		F	Purge Date:	30 May	18		ing Began:	1110	(am/pm
							Well P	urged Dry?	Yes	No		urged Dry:		am/pm
							Sa	mple Date:	30 May	<u> 118</u>	Time of	Sampling:	1255	am/pm
	Depth to To	p of Pump:		3265 <u> </u>	ft				, ,					
Wat	er Level Aft	er Sample:	5	-,98	ft		Bottle	1L Raw	500mL	. Nitric	500mL Niti	ric (filtered)	250 S	ulfuric
<u> </u>	Measureme	nt Method:	Electric	Water Level	Indicator		List:							
					Field	Measure	ments							
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL		Description		
(3 cons	secutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Ode		
SEQ#	Time		±5%	√ ±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		1	Slightly Turbid	, Turbid	
1	1115	8.45	1382	7.07.32	1//-/	-24.1	71000	5.00	100	500		d, Tan		
2	1145	7.73	1387	7,36	0,17	-9,3	485	5063	100	3000	Tub;			
3	12-15	7.62	1385	7,36	0,66	-5,5	219	6205	100	3000	Purpi			
4	1245	9,88	13 77	7,36	0110	-12,7		5.98	100	300	7	tubid		
5	1250	9.85	13778	7.36	0,09	-12,3	146	5198	100	500	57			
7	1255	9.85	1378	7,36	0,09	-15,5	143	5068	100	500	<u> </u>			
8														1
9														Å,
10														
Stabilized:	Yes	No	<u>I</u>	<u> </u>	L	<u> </u>	7	Total Volume	e Removed:	10500	mL			•
Comments	s: * 30m	.10 - 19	-				·			100	_			
55	* JUM	LY 18 ON(A)												

The turbility sabilized out at Ser 4-6.



**Groundwater Assessment** 

line for 2 min before somples

Company:	MDU Lewis and Clark	
Event:	Spring 2018	•
Sample ID:	108	
Sampling Personal:	Darren Niecurans	

2010 =	. Broadway	Ave,	Bismarck,	INL
	Db /70	4) 050	0700	

Phor	ne: (701) 258-9	9720		_						r-			
Weather C	onditions:		Temp:	62	°F	Wind:	North	@ (0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Precip:	Sunny / Parl	tly Cloudy / Clo	oudy
		Well Info	ormation				Sampling Information						
We	ell Locked?	Yes	No			Purgir	ng Method:	Blac	ider				
We	II Labeled?	Nes	No			Samplin	ng Method:	Blac	lder	Control Settings		gs	
Casin	g Straight?	Yes	No		_		Dedicat	ed Equip?:	Yes	No	Pur	rge: 5	s
Grout S	Seal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	(NO	Reco	ver: 55	s
Repairs Ne	ecessary:						Duplicate :	Sample ID:			F	PSI:	
	Casing	Diameter:	,_	2"									
Water Level Before Purge: 16,82 ft			F	urge Date:	31 Ma	Y18	Time Purging Beg	an: 0727	(am/				
			Well P	urged Dry?	Yes	No	Time Purged D	Dry: 19 802	- <b>a</b> m/				
			Sa	mple Date:	37 Mar	118	Time of Sampli	ng: [[19]	(and)				
	Depth to To	p of Pump:	15	8.18	ft				<del>'''                                  </del>				
Wat	er Level Aft	er Sample:	ft				Bottle	1L Raw	500mL Nitric 500mL Nitric			ed) 250 S	ulfuric
I N	/leasuremer	nt Method:	Electric Water Level Indicator				List:						
					Field	Measure	ements						
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Descript		
<del></del>	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color,		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Tu	ırbid, Turbid	
1	0732	10,50	53917	6.70	3,39	54,07	40,6	17.38	100	500	Exslightly	+u/bid	
2	DA7	10.38	5391	6,73	3.12	847,2	31,5	1.7.79	180	1500	57	/	
3	0702	10.91	5369	6.72	216	47,8	244	18,18,00	100	1500	TUVERD		
1 1	1 -	•	'			l "	`	l' '		1	•	.1	

Total Volume Removed: 3700 mL

Stabilized: Comments:

Yes

9 10



**Groundwater Assessment** 

Company:	MDU Lewis and Clark							
Event:		Spring 2018						
Sample ID:	109							
Sampling Personal:	Darren	Meswaas						

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Stabilized:

1 1101	10. (101) 200 0	7.20												
Weather C	onditions:		Temp:	78 <b>(ALA</b> )	°F	Wind:	N	@ 4,		Precip:	Sunn	y / Partly C	loudy / Clo	udy
		Well Info	rmation					Sampling Information						
We	ll Locked?	Yes	(No				Purgir	ng Method:	Blad	lder				
Wel	I Labeled?	Yes	No				Samplir	ng Method:	Blac	lder		Coi	ntrol Setting	S
Casing	g Straight?	Yes	No				Dedicat	ed Equip?:	Yes	No)		Purge:	5	sec.
Grout S	eal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No		Recover:	55	sec.
Repairs Ne	ecessary:						Duplicate S	Sample ID:		-		PSI:	25	
	Casing	Diameter:		2"										
Wate	er Level Bef	ore Purge:	10	137	ft		Р	urge Date:	30,164	18	Time Purgi		1452	am/pm
							Well Pเ	urged Dry?	Yes	(No		urged Dry:		am/pm
							Sa	mple Date:	30 May	118	Time of	Sampling:	1527	am/pm
Depth to Top of Pump: $///_{e}/C$ fi				· ft				/	<u>.</u>					
Water Level After Sample: ∫ ೧५५√		ft		Bottle	1L Raw	500mL	Nitric Nitric	500mL Nitr	ic (filtered)	250 Su	furic			
IV.	1easuremer	nt Method:	Electric \	Nater Level	Indicator		List:							
					Field	Measure	ments							
Stabili	zation	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL		Description:		
	ecutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Odo		
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		<del></del>	Slightly Turbid,	Turbid	
1	1557	14.58	1688	7.33	0,45	57.3	9,69	10,45	100	500	Clea			
2	11/2	15,39	1675	7,32	0,14	59.7	3,9177	55-10-46	100	1500	0/20			
3	1517	15,01	16,77	7.32	0112	55,9	2,6	10,46	100	500	C (2)			
4	1522	15,24	1681	7,33	Dill	55,7	2,49	10,47		.500	Clea			
5	1527	14,66	1669	7.32	0010	5616	2,47	10,47	100	500	Clear			
6			·									······································		
7								· · · · · · · · · · · · · · · · · · ·						
8									·					
9														
10	I //- )					1	1		1	j.	l			

Total Volume Removed: 3500



**Groundwater Assessment** 

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:		
Sampling Personal: Parcero	Niecinaas	

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

	` '													<del></del>
Weather Cor	nditions:		Temp:	61	°F	Wind:	North	@ (0		Precip:	Sunn	ıy / Partiy Cl	oudy IC	Joudy
Weather Got		Well Info		<del></del>					Sa	mpling lr	nformatio	n		
\\/oil	Locked?	Yes	No	Lock	raj vustu	halto	Purgir	ng Method:	Blad	der				
	abeled?	Yes	No No		cost	Samplir	ng Method:	Bladder			Cor	ntrol Settir	ngs	
	Straight?	Yes	No				Dedicat	ed Equip?:	Yes	No		Purge: 1	<u> </u>	
Grout Sea		Yes	No	Not V	'isible		Duplicate		Yes	(NO)		Recover:	55	
Repairs Nece		(193	HO I				Duplicate S					PSI:		
Repairs Nece		Diameter:	· · · · · · · · · · · · · · · · · · ·	2"										
Mator		ore Purge:	Y in the same	TANK TO SERVICE	ft ft		P	urge Date:	3 Mars	(18	Time Purg	ing Began:	78-11	aı Zaı
vvalei	revei pei	ore range.		7.72				urged Dry?	Yes	άViο	Time P	ourged Dry:		aı
				<u> </u>				mple Date:	31 may 1	8	Time of	f Sampling:	1026	(ái
Do	oth to To	p of Pump:	26	1717	ff	1		<u> </u>					J	
	··	er Sample:		<u>. /                                    </u>	ff	1	Bottle	1L Raw	500mL	. Nitric	500mL Niti	ric (filtered)	250 9	Sulfuri
		nt Method:	Electric \	Water Level	Indicator	1	List:							
) ivie	asuremen	it ivietriou.	Liectric	rater Level	maicator	1								
					Field	Measure	ements							_
Stabiliza	ition	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	l	Description:		
(3 consec	cutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		v, Color, Odo Slightly Turbid,		-
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min			ā	Turbia	_
1	18/b	12.60	2343	77.31	653	14,6	348	9,41	100	500	Tussi	, ,		_
2	1846	11,74	2480	1738	0,17	35,0	1007	9,36	100	3000	Slight			-
3 6	2916	12.06	24175	7,39	0,10	34,0	47.9	9.32	100	3000	C lear			-
4	3431	12,00	24770	17.30	0,09	3326	48,0	930	100	1500.	Clea	<u></u>		
5 /	AO (	12.62	2471	740	0.08	33.6	21,4	9,20	100	3000 .	clear			-
	1016	12,31	2472	7,40	0,08	34.0	20,9	9118	100	1500.	c/ecu			_
7	1021	12216	2471	7.40	0.08	33.9	19,2	9.18	100	500	clear			_
8	1026	12,14	2469	7.40	10.08	33,9	19,2	gill	100	500	dec			-
9	, , , , , , ,								ļ .					-
10								<u> </u>		124-00				
Stabilized:	((Yes	No		•			-	Fotal Volum	e Removed	13,500	_mL			



2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720 **Water Level** 

Sampling Personnel:			Company:				
- Parren Niesu	Ü A G			MDU Lewis and Clark			
		C. May Time					
Well ID	Date	pro time	Gauge Reading	Comments			
East Scrubber Pond Gauge	31May18	Jag 1104	3,78				
West Scrubber Pond Gauge	31MKy18	1105	0,5				
Stream behind Sewage Lagoon	340ay 18	1103	3,0				
	/						



2616 E. Broadway Ave, Bismarck, ND

Water Level

Phone: (701) 258-9720

Sampling P	ersonnel: Nen Vies	wang		MDU Lewis and Clark
Well ID	Date	Time	Depth to Water	Comments
MW101	29May 18	1146	9,00	
MW105	29ML418	1150	8,78	
MW106	29May 18	1157	9.53	
MW107	29 May 18	1143	4.31	
MW108	29 may 8	1157	16.87	
MW116	29May 18	1203	10.54	
MW210	Zanayis	1216	9,15	
	1 2.7.0			

**Surface Water** 

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	West Englise Pand	
Sampling Personal:	Norman Ningrans	

Weather Conditions: Temp: 67 °	Wind: North	Q10	Precip	: Sunn	y / Partly Cloudy /رواره	oudy/	
Site Description		Sampling Information					
Source Pond Stream Other:	Sar	npling Method:	Grab				
			4				
Latitude: 47,67972	1	Sample Date: <u>名</u> の	Time of	Sampling: 105	/am/pm		
Longitude:104,15724			/ / /		, ,		
	Bottle	е	1-Liter-Raw		4-1-Nitric		
Gauge Reading: 0,5	List:	501 naL_Nita	ric 250-m	_Sulfuric	T TE MICHO		

#### **Field Measurements**

Time	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)			Description: Clarity, Color, Odor, Ect.
						- Constitution of the Cons	Commenced State State Services and Services Serv	Security of the Control of the Contr	- American Contract of the Con

Comments

There was only rain water that collected by the guage. The rest of the ford was dry, There wasn't a repersentive sample to collect.

Company: MDU Lewis and Clark

Event:

Spring 2018

Sunny / Partly Cloudy / Cloudy

**Surface Water** 

Sample ID: Sewage Sampling Personal: Po

Darren Nieswaag

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Weather Conditions:	Temp: 60°F										
Site Description											
Source: Pond	Stream Other:										
Latitud	de: 47.18098										
Longitud	de: -104 15514										
Gauge Readir	ng:										

		Sampling	j Informatio	on'					
Sampling Method:		Grab							
Sai	mple Date: 21	mavis	Time of	Sampling: 6/8-35	(am/pn				
	) ''	7.0							
Bottle		1 Liter Raw		4 - 1L Nitric					
List:	50 <b>₽</b> mL Nit	ric 250 r	nL Sulfuric	4 - IL MILIO					
	500 M N	Filteral							

Precip:

#### Field Measurements

	Temp	Spec.		DO	ORP	Turbidity	Description:
Time	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Clarity, Color, Odor, Ect.
0835	20,29	3552	7.89	1.73	40.6	35.9	Slightly turbid

Wind: Light

Comments:

**Surface Water** 

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Company:	MDU Lewis and Clark				
Event:	Spring 2018	e			
Sample ID:	581				
Sampling Personal:	Dances ACTESTARS				

Weather Conditions: Temp: 66 °	F Wind: 1- ight		Precip: Şun	ny∕l Partly Cloudy / Clou	dy	
Site Description			Sampling Information			
Source: Pond Stream Other:	Sampl	ing Method: Gr	ab			
Latitude: 47-6808 Longitude: - 104-16-268	Si Si	ample Date: 7 5 May	18 Time o	of Sampling: 1635	am/pn	
	Bottle	1 Lite	r Raw	4 - 1L Nitric		
Gauge Reading:	List:	50⊈mL Nitric	250 mL Sulfuric	4 - IL NIUIC		
		500 MCN. this				

#### **Field Measurements**

	Temp	Spec.		DO	ORP	Turbidity	Description:
Time	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Clarity, Color, Odor, Ect.
1035	17,73	789	7.87	6,78	61.6	174	Slightly twoist

Comments:

## **Field Datasheet**

**Surface Water** 

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Company:	MDU Lewis and Clark	•
Event:	Spring 2018	-
Sample ID:	SP2	
Sampling Personal:	Darren Nortwang	

Weather Conditions: Temp:	°F Wind:	Light			Precip:	Sunn	√   Partly Cloudy   Cloudy	udy			
Site Description		Sampling Information									
Source: Pond Stream Other:		Samplin	g Method:	Gı	rab						
	•										
Latitude: 47.6810		Sar	nple Date:	30Ma	118	Time of	Sampling: 1056	am/pn			
Longitude:104.1535	5		-	,	7		1				
		Bottle		1 Lite	er Raw		1 11 Nitria				
Gauge Reading:		List:	50% mL	Nitric	250 mL St	ulfuric	4 - 1L Nitric				
			500ML	NFilte	al						

### Field Measurements

Time	Temp (°C)	Spec. Cond.	Hq	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Description: Clarity, Color, Odor, Ect.
1056	17,77	793	7.78	7.91	61,7	399	Tabid

Comments:

### **MVTL Calibration Worksheet**

Site: MDU Lev	vis and Clark		Darren Niesmans
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS 04H14736	#8 556 MPS 12E102056
Date: 29Ma	Pre Site Calib	ration	Post Site Check
pH  Buffer 7  Buffer 10  Buffer 4  Conductivity	Temp °C Pre Cal Post Cal  21,00 6,99 7.00  21,04 10,09 10,00  21,16 3,95 4,00	Post Cal Range mv 50  6.95-7.05	pH Temp °C Reading  Buffer 7 26.0( 7.04)  Conductivity
Buffer 1413 <b>ORP</b> 231 mV @ 25C	21,32 232.8 231.0	±10% Buffer 5000 4 9 48	Buffer 5000 25,68 4969
DO	20,15 8,2 8,38	Barometric Pressure (mm Hg)  mg/L  00 57+6	
pH  Buffer 7  Buffer 4	Time: ()630  Temp°C Pre Cal Post Cal  21,24 6,98 7,00  21,36 9,98 10,00  21,24 4,05 4,00	Post Cal Range mv 50  6.95-7.05	nh Temp °C Reading Buffer 7 29.82 7.05
Conductivity Buffer 1413 ORP 231 mV @ 25C	21,19   1391   1414 7,34   253,2   231.0	#10% Buffer 5000 4947 ±10 mV	Conductivity  Buffer 5000 27,77 14984
DO	21,07 8,19 8,21	Barometric Pressure (mm Hg) mg/L 701.3	

### **MVTL Calibration Worksheet**

Site: MDU Lev	vis and Clark	Techni	ician: Daller Nieswagg
Instrument (Circle One):	#1 650 MDS 08F100203	#2 650 MDS 04H14736	#3 556 MPS 12E102056
pH  Buffer 7  Buffer 4  Conductivity	Temp °C Pre Cal Post 21.23 6.96 7.0 21.30 10.06 10.0 21.31 4.05 4.0	mv Rar  Cal Post Cal Range mv 50  0 6.95-7.05 35.6 0 +/-  9.95-10.05 215.8 -180 +  0 4.95-5.05 139,9 180 +  Che	pH Temp °C Reading  Buffer 7 1930 7.03  H-50  eck Conductivity
Buffer 1413 <b>ORP</b> 231 mV @ 25C <b>DO</b>	21.13 1426 14 6.70 2302 231 20:72 7.82 8.3	Barometric Pressure (mm Hg)	Buffer 5000 19,21 4911
pH Buffer 7 Buffer 10 Buffer 4 Conductivity Buffer 1413 ORP	Time:  Temp °C Pre Cai Post	Cal Post Cal Range mv 50 6.95-7.05 0+/- 9.95-10.05 -180 + 4.95-5.05 180 + Che ±10% Buffer 5000	pH Temp °C Reading - 50 Buffer 7
231 mV @ 25C DO		±10 mV  Barometric Pressure (mm Hg)  mg/L	



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



### CASE NARRATIVE - AMENDED 8 AUG 18 (Sample ID MW111, Field Data)

MVTL Lab Reference No/SDG:

201882-1191

Client:

**Montana Dakota Utilities** 

Location:

MDU Lewis & Clark

**Project Identification:** 

CCR Spring 2018

**MVTL Laboratory Identifications:** 

18-W1400 through 18-W1417

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #					
Dup 1	18-W1400					
Field Blank (FB)	18-W1401					
MW103	18-W1402					
MW110	No sample					
MW119	18-W1403					
MW111	18-W1404					
MW117	No sample					
MW118	18-W1405					
MW120	18-W1406					
Dup 2	18-W1407					
MW101	18-W1408					
MW105	18-W1409					
MW106	18-W1410					
MW107	18-W1411					
MW108	18-W1412					
MW109	18-W1413					
MW116	18-W1414					
West Scrubber Pond	No sample					
Sewage Lagoon	18-W1415					
SP1	18-W1416					
SP2	18-W1417					

#### I. RECEIPT

- All samples were received at the laboratory on 31 May 2018 at 1608.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 1.0°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

• With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



### CASE NARRATIVE – AMENDED 8 AUG 18 (Sample ID MW111, Field Data)

MVTL Lab Reference No/SDG:

201882-1191

Client:

Montana Dakota Utilities

Location:

MDU Lewis & Clark

**Project Identification:** 

CCR Spring 2018

**MVTL Laboratory Identifications:** 

18-W1400 through 18-W1417

Page 2 of 2

#### III. METHODS

Approved methodology was followed for all sample analyses.

#### IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - o For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).

#### V. REPORT

 Per email dated 26 Jul 18 from Terri Olson with Barr Engineering, the case narrative was amended to correct the sample identification for MW111. In addition, the field summary sheet and field letter were amended to correct errors.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

Claudette Carroll - MVTL Bismarck Laboratory Manager

DATE:

### **Claudette Carroll**

From:

Terri A. Olson <TOlson@barr.com>

Sent:

Wednesday, August 08, 2018 1:36 PM

To:

Claudette Carroll; Marshall, Samantha

Cc:

Justin Soberaski

Subject:

RE: 201882-1191 questions

Follow Up Flag:

Follow up

Flag Status:

Flagged

Hi Claudette,

### Couple of items:

- I believe we will need a new EDD since the one well was listed as MW11 instead of MW111.
- The revised field report states that the duplicate was from MW106 instead of MW118 (see below). This is
  incorrect.

insufficient recharge of the well to collect the full bottle set. A duplicate sample was also collected from well MW106, not MW118 which as stated in the Letter dated June 15, 2018.

The previous narrative had stated this:

so sampling could be conducted at a later date. Duplicate samples were collected from wells MW116 and 118. Samples collected were placed on ice and transported to MVTL

My understanding is that there were two field duplicates – MW118 and either MW106 or MW116. Wanted to verify so the question sent previously was this: Field report states that duplicate samples were collected from wells MW116 and MW118; however, the raw data shows MW106 not MW116. Which is correct?

Let me know if you have questions.

Thank-you,

Terri A. Olson Senior Data Quality Specialist Minneapolis, MN office: 952.842.3578 TOlson@barr.com www.barr.com



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From: Claudette Carroll < ccarroll@mvtl.com> Sent: Wednesday, August 8, 2018 1:15 PM

To: Marshall, Samantha <Samantha.Marshall@mdu.com>

Cc: Terri A. Olson <TOlson@barr.com>; Justin Soberaski <JSoberaski@barr.com>

Subject: RE: 201882-1191 questions

Hi Sam,

Per Terri's email below, please find the amended data packages for this work order. EDDs are not being sent, since no data results were changed. Let me know if you have any questions.

Have a good rest of your day!

### Claudette



## Minnesota Valley Testing Laboratories, Inc.

Providing Analytical Excellence Since 1951

ccarroll@mvtl.com

701-258-9720

2616 E. Broadway Ave/Bismarck, ND 58501

From: Terri A. Olson [mailto:TOlson@barr.com]

Sent: Thursday, July 26, 2018 9:51 AM
To: Claudette Carroll < <a href="mailto:ccarroll@mvtl.com">ccarroll@mvtl.com</a>
Subject: Re: 201882-1191 questions

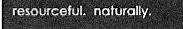
Hi Claudette,

Below are my questions/comments on report 201882-1191.

- Looks like metals were crossed off for MW108 but no information on raw data sheet or in field report narrative as to why.
- MW101 had total volume removed reported as 3,500 mL, should be 4,500 mL per raw data.
- MW106 had total volume removed reported as 5,000 mL, should be 5,500 mL per raw data.
- Field report states that duplicate samples were collected from wells MW116 and MW118; however, the raw data shows MW106 not MW116. Which is correct?
- Report lists MW11 but this should be MW111.

#### Thank-you,

Terri A. Olson Senior Data Quality Specialist Minneapolis, MN office: 952.842.3578 TOlson@barr.com www.barr.com





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**Quality Control Report** 

Lab IDs: 18-W1400 to 18-W1417 Project: MDU Lewis & Clark CCR Work Order: 201882-1191

Lab LDS: 18-W 1400 to 18-W					s & Clark CCF	Matrix		Matrix	882-119 Matrix	MSD/				MSD/			
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Spike Orig Result	Matrix Spike Result	Spike Rec %	Spike % Rec Limits	Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.1000	104	80-120	0.400 0.100	18W1408q 18W1417q	< 0.001 < 0.001	0.4046 0.1020	101 102	75-125 75-125	0.4046 0.1020	0.4202 0.1044	105 104	3.8 2.3	20 · 20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	98 Ā	80-120	0.400 0.100	18W1408q 18W1417q	< 0.002 0.0052	0.4094 0.1094	102 104	75-125 75-125	0.4094 0.1094	0.4368 0.1070	109 102	6.5 2.2	20 20	-	-	< 0.002
Barium - Total mg/l	0.1000	99	80-120	0.400 0.100	18W1408q 18W1417q	0.0286 0.0983	0.4312 0.2012	101 103	75-125 75-125	0.4312 0.2012	0.4498 0.2016	105 103	4.2 0.2	20 20	-	-	< 0.002
Beryllium - Total mg/l	0.1000	98	80-120	0.400 0.100	18W1408q 18W1417q	< 0.0005 < 0.0005	0.3582 0.1056	90 106	75-125 75-125	0.3582 0.1056	0.3530 0.1066	88 107	1.5 0.9	20 20	-	-	< 0.0005
Boron - Total mg/l	0.40 0.40	110 110	80-120 80-120	4.00 0.400 0.400	18-W1406 18-W1408 18-W1411	2.87 0.35 0.19	6.92 0.78 0.57	101 108 95	75-125 75-125 75-125	0.78	7.14 0.79 0.57	107 110 95	3.1 1.3 0.0	20 20 20	- - -	- - -	< 0.1 < 0.1 < 0.1 < 0.1
Cadmium - Total mg/l	0.1000	101	80-120	0.400 0.100	18W1408q 18W1417q	< 0.0005 < 0.0005	0.4078 0.1045	102 104	75-125 75-125		0.4108 0.1079	103 108	0.7	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0 20.0 20.0 20.0 20.0 20.0 20.0	106 108 110 110 110 108	80-120 80-120 80-120 80-120 80-120 80-120		18W1403q 18W1408q 18D2123q 18W1281q 18W1416q	92.2 107 87.8 304 55.0	182 193 186 830 150	90 86 98 105 95	75-125 75-125 75-125 75-125 75-125	182 193 186 830 150	181 201 185 825 151	89 94 97 104 96	0.6 4.1 0.5 0.6 0.7	20 20 20 20 20 20 20		-	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <
Chloride mg/l	30.0 30.0 30.0 30.0	98 99 96 97	80-120 80-120 80-120 80-120	30.0 30.0	18-W1382 18-W1405	37.2 25.7	68.5 55.7	104 100	80-120 80-120		68.6 57.3	105 105	0.1 2.8	20 20	-		<1 <1 <1 <1
Chromium - Total mg/l	0.1000	97	80-120	0.400 0.100	18W1408q 18W1417q	< 0.002 0.0047	0.3972 0.1109	99 106	75-125 75-125	0.3972 0.1109	0.4094 0.1105	102 106	3.0 0.4	20 20	_	-	< 0.002

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Quality Control Report Lab IDs: 18-W1400 to 18-W1417

Project: MDIII ewic & Clark CCP

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Cobalt - Total mg/l	0.1000	100	80-120	0.400 0.100	18W1408q 18W1417q	< 0.002 < 0.002	0.4028 0.1080	101 108	75-125 75-125	0.4028 0.1080	0.4060 0.1070	102 107	0.8	20 20 20	-	- -	< 0.002
Fluoride mg/l	0.50 0.50	106 102	90-110 90-110	0.500 0.500 0.500 0.500	18-W1391 18-W1405 18-W1408 18-W1419	0.37 1.12 0.37 0.53	0.90 1.57 0.92 1.08	106 90 110 110	80-120 80-120 80-120 80-120	0.90 1.57 0.92 1.08	0.91 1.63 0.93 1.09	108 102 112 112	1.1 3.7 1.1 0.9	20 20 20 20 20	- - -	-	< 0.1 < 0.1 < 0.1 < 0.1
Lead - Total mg/l	0.1000	98	80-120	0.400 0.100	18W1408q 18W1417q	< 0.0005 0.0025	0.3792 0.1008	95 98	75-125 75-125	0.3792 0.1008	0.3972 0.0996	99 97	4.6 1.2	20 20	-	-	< 0.0003
Lithium - Total mg/l	0.40 0.40	108 108	80-120 80-120	0.400 0.400	18-W1408 18-W1417	< 0.1 < 0.1	0.45 0.40	112 100	75-125 75-125	0.45 0.40	0.46 0.41	115 102	2.2 2.5	20 20	-	- -	< 0.1 < 0.1 < 0.1 < 0.1
Mercury - Total mg/l	0.0020 0.0020	90 105	85-115 85-115	0.002 0.002 0.002 0.002	18-W1390 18-W1404 18-W1410 18-W1417	< 0.0002 < 0.0002 < 0.0002 < 0.0002	0.0019	95 100 95 110	70-130 70-130 70-130 70-130	0.0019 0.0020 0.0019 0.0022	0.0019 0.0017 0.0019 0.0022	95 85 95 110	0.0 16.2 0.0 0.0	20 20 20 20 20	-	- - -	< 0.0002 < 0.0002
Molybdenum - Total mg/l	0.1000	104	80-120	0.400 0.100	18W1408q 18W1417q	< 0.005 < 0.005	0.4090 0.1124	102 112	75-125 75-125	0.4090 0.1124	0.4276 0.1130	107 113	4.4 0.5	20 20	-	-	< 0.002
pH units		- - -	- - -	-	- - -		-	-	-	7.6 8.0 8.3 7.6	7.6 8.0 8.3 7.6	-	0.0 0.0 0.0 0.0	20 20 20 20 20	-	-	
Selenium - Total mg/l	0.1000	96	80-120	0.400 0.100	18W1408q 18W1417q	< 0.005 < 0.005	0.4008 0.0986	100 99	75-125 75-125	0.4008 0.0986	0.4294 0.1034	107 103	6.9 4.8	20 20	-	-	< 0.005

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Quality Control Report
Lab IDs: 18-W1400 to 18-W1417

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Sulfate mg/l	100 100 100 100	94 107 108 112	80-120 80-120 80-120 80-120	200 100	18-W1393 18-W1408 18-W1401 18-W1417	< 5 336 < 5 182	105 558 107 384	105 111 107 101	80-120 80-120 80-120 80-120	105 558 107 384	103 560 106 387	103 112 106 102	1.9 0.4 0.9 0.8	20 20 20 20 20		- - -	< 5 < 5 < 5 < 5
Thallium - Total mg/l	0.1000	98	80-120	0.400 0.100	18W1408q 18W1417q	< 0.0005 < 0.0005		95 99	75-125 75-125	0.3812 0.0990	0.3996 0.0982	100 98	4.7 0.8	20 20	-	-	< 0.0005
Total Dissolved Solids mg/l		-	-	_	-	-	-	-	-	512	516	_	0.8	20	-	-	< 10

Approved by:



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southqate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup 1

Event and Year: Spring 2018

1 of 18 Page:

Report Date: 28 Jun 18 Lab Number: 18-W1400 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18

Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Н	* B,O	units	0.1	SM4500 H+ B	1 Jun 18 18:00	svs
Fluoride	1.12	mg/l	0.10	SM4500-F-C	5 Jun 18 18:00	svs
Sulfate	466	mg/1	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	25.9	mg/1	1.0	SM4500-C1-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	1090	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	76.3	mg/1	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/1	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.62	mg/1	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0248	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0023	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0390	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0590	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Claudite K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: Field Blank

Event and Year: Spring 2018

Report Date: 28 Jun 18 Lab Number: 18-W1401 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Hq	* 6.8	units	0.1	SM4500 H+ B	1 Jun 18 18:00	svs
Fluoride	< 0.1	mg/1	0.10	SM4500-F-C	5 Jun 18 18:00	svs
Sulfate	< 5	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	< 1	mg/l	1.0	SM4500-C1-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	< 1	mg/1	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/1	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Bervllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

<sup>\*</sup> Holding time exceeded

Approved by:

K. Canreo Z8Jun 18 Clauditte

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

# - Due to concentration of other analytes + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW103

Event and Year: Spring 2018

Report Date: 28 Jun 18 Lab Number: 18-W1402 Work Order #: 82-1191 Account #: 002800

Date Sampled: 29 May 18 14:54 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	29 May 18 14:54	DJN
PH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	svs
Temperature - Field	12.8	Degrees C	NA	SM 2550B	29 May 18 14:54	DJN
Conductivity - Field	1476	umhos/cm	1	EPA 120.1	29 May 18 14:54	DJN
Fluoride	0.79	mg/1	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	386	mg/1	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	28.2	mg/1	1.0	SM4500-C1-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	1040	mg/1	10	I1750-85	1 Jun 18 8:55	SVS
Calcium - Total	84.8	mg/1	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	1.32	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	0.0076	mg/1	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0028	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0373	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0073	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0267	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0446	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Claudette K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### = Due to sample matrix

## = Due to co

## = Due to in



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4 of 18 Page:

Report Date: 28 Jun 18 Lab Number: 18-W1403 Work Order #: 82-1191 Account #: 002800

Date Sampled: 29 May 18 12:58 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW119

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34	units	NA	SM 4500 H+ B	29 May 18 12:58	DJN
pH	* 8.0	units	0.1	SM4500 H+ B	1 Jun 18 18:00	SVS
Temperature - Field	10.6	Degrees C	NA	SM 2550B	29 May 18 12:58	DJN
Conductivity - Field	1118	umhos/cm	1	EPA 120.1	29 May 18 12:58	DJN
Fluoride	0.43	mg/1	0.10	SM4500-F-C	5 Jun 18 18:00	SVS
Sulfate	193	mg/l	5.00	ASTM D516-07	7 Jun 18 14:26	EMS
Chloride	26.5	mg/1	1.0	SM4500-C1-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	5 Jun 18 12:32	EV
Total Dissolved Solids	714	mg/l	10	I1750-85	1 Jun 18 8:55	svs
Calcium - Total	92.2	mg/l	1.0	6010D	12 Jun 18 14:20	SZ
Lithium - Total	< 0.1	mg/1	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	0.22	mg/l	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0324	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Report Date: 28 Jun 18

Lab Number: 18-W1404 Work Order #: 82-1191 Account #: 002800

Date Sampled: 29 May 18 17:29 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW111

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	29 May 18 17:29	DJN
pH	* 7.9	units	0.1	SM4500 H+ B	1 Jun 18 18:00	svs
Temperature - Field	12.7	Degrees C	NA	SM 2550B	29 May 18 17:29	DJN
Conductivity - Field	2997	umhos/cm	1	EPA 120.1	29 May 18 17:29	DJN
Fluoride	2.10	mg/1	0.10	SM4500-F-C	5 Jun 18 18:00	svs
Sulfate	1890	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	32.7	mg/l	1.0	SM4500-C1-E	31 May 18 16:43	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	5 Jun 18 12:32	EA
Total Dissolved Solids	2730	mg/1	10	I1750-85	1 Jun 18 8:55	svs
Calcium - Total	150	mg/l	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	0.15	mg/l	0.10	6010D	13 Jun 18 9:10	SZ
Boron - Total	6.06	mg/1	0.10	6010D	14 Jun 18 14:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0170	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0616	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0596	mg/1	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Clauditte K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\emptyset$  = Due to sample matrix  $\emptyset$  = Due to conduct the sample quantity  $\emptyset$  = Due to incomplete the sample quantity

# = Due to concentration of other analytes + = Due to internal standard response



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Report Date: 28 Jun 18 Lab Number: 18-W1405 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southqate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW118

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Dat Ana	e alyze	ed		Analyst	
pH - Field	7.45	units	NA	SM 4500 H+ B		May		8:35	DJN	-
pH	* 8.1	units	0.1	SM4500 H+ B				18:00	SVS	
Temperature - Field	12.8	Degrees C	NA	SM 2550B		May		8:35	DJN	
Conductivity - Field	1574	umhos/cm	1	EPA 120.1	3.0	May	18	8:35	DJN	
Fluoride	1.12	mg/1	0.10	SM4500-F-C				18:00	SVS	
Sulfate	551	mg/1	5,00	ASTM D516-07				15:54	EMS	
Chloride	25.7	mg/l	1.0	SM4500-C1-E				17:20	RAG	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6	Jun	18	11:27	EV	
Total Dissolved Solids	1100	mg/l	10	11750-85	1	Jun	18	8:55	svs	
Calcium - Total	78.0	mg/l	1.0	6010D	12	Jun	18	15:20	SZ	
Lithium - Total	< 0.1	mg/l	0.10	6010D	13	Jun	18	9:10	SZ	
Boron - Total	1.63	mg/1	0.10	6010D		J 6416		14:14	SZ	
Antimony - Total	< 0.001	mg/1	0.0010	6020B	12	Jun	18	11:39	BT	
Arsenic - Total	0.0021	mg/l	0.0020	6020B	12	Jun	18	11:39	BT	
Barium - Total	0.0236	mg/l	0.0020	6020B				11:39	BT	
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12	Jun	18	11:39	BT	
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun	18	11:39	BT	
Chromium - Total	0.0024	mg/l	0.0020	6020B	12	Jun	18	11:39	BT	
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12	Jun	18	11:39	BT	
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun	18	11:39	BT	
Molybdenum - Total	0.0397	mg/l	0.0020	6020B	12	Jun	18	11:39	BT	
Selenium - Total	0.0577	mg/l	0.0050	6020B	12	Jun	18	11:39	BT	
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun	18	11:39	BT	

\* Holding time exceeded

Approved by:

Claudette K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



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Report Date: 28 Jun 18 Lab Number: 18-W1406 Work Order #: 82-1191 Account #: 002800

Date Sampled: 29 May 18 19:14 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyze	6	Analyst
pH - Field	6.88	units	NA	SM 4500 H+ B	29 May	8 19:14	DJN
pH	* 7.7	units	0.1	SM4500 H+ B		8 18:00	svs
Temperature - Field	9.89	Degrees C	NA	SM 2550B	29 May		DJN
Conductivity - Field	3761	umhos/cm	1	EPA 120.1	29 May :		DJN
Fluoride	0.42	mg/1	0.10	SM4500-F-C		8 18:00	svs
Sulfate	2450	mg/1	5.00	ASTM D516-07		8 15:54	EMS
Chloride	31.5	mg/l	1.0	SM4500-C1-E	31 May :	8 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun	8 11:27	EV
Total Dissolved Solids	3560	mg/1	10	11750-85	1 Jun	8:55	SVS
Calcium - Total	293	mg/l	1.0	6010D	12 Jun	8 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun	8 9:10	SZ
Boron - Total	2.87	mg/1	0.10	6010D	14 Jun	8 14:14	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	12 Jun	8 11:39	BT
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun	8 11:39	BT
Barium - Total	0.0422	mg/1	0.0020	6020B	12 Jun	8 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B		8 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun	8 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B		8 11:39	BT
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	12 Jun	8 11:39	BT
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun	8 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun	8 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun	8 11:39	BT
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun	8 11:39	BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup2

Event and Year: Spring 2018

Report Date: 28 Jun 18 Lab Number: 18-W1407 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18

Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Anal	e Lyzed	Analyst
рН	* 8.0	units	0,1	SM4500 H+ B	1 0	Jun 18 18:	00 SVS
Fluoride	2.04	mg/1	0.10	SM4500-F-C	5 .	Jun 18 18:	00 SVS
Sulfate	1400	mg/1	5.00	ASTM D516-07	7 0	Jun 18 15:	54 EMS
Chloride	32.8	mg/l	1.0	SM4500-C1-E	31 1	May 18 17:	20 RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 .	Jun 18 11:	27 EV
Total Dissolved Solids	2330	mg/l	10	11750-85	1 6	Jun 18 8:	55 SVS
Calcium - Total	130	mg/1	1.0	6010D	12	Jun 18 15:	20 SZ
Lithium - Total	0.14	mg/l	0.10	6010D	13 6	Jun 18 9:	10 SZ
Boron - Total	5.16	mg/l	0.10	6010D	14	Jun 18 14:	14 SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	12 .	Jun 18 11:	39 BT
Arsenic - Total	< 0.002	mg/1	0.0020	6020B	12	Jun 18 11:	39 BT
Barium - Total	0.0332	mg/l	0.0020	6020B	12	Jun 18 11:	39 BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun 18 11:	39 BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun 18 11:	39 BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12	Jun 18 11:	39 BT
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	12 .	Jun 18 11:	39 BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12	Jun 18 11:	39 BT
Molybdenum - Total	0.0592	mg/1	0.0020	6020B	12 .	Jun 18 11:	39 BT
Selenium - Total	0.0721	mg/l	0.0050	6020B	12	Jun 18 11:	39 BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 .	Jun 18 11:	39 BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to con
! = Due to sample quantity + = Due to int

# = Due to concentration of other analytes
+ = Due to internal standard response



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW101

Event and Year: Spring 2018

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Report Date: 28 Jun 18 Lab Number: 18-W1408 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 14:16 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.39	units	NA	SM 4500 H+ B	30 May 18 14:1	
PH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:0	
Temperature - Field	14.9	Degrees C	NA	SM 2550B	30 May 18 14:1	
Conductivity - Field	1266	umhos/cm	1	EPA 120.1	30 May 18 14:1	
Fluoride	0.37	mg/l	0.10	SM4500-F-C	6 Jun 18 17:0	
Sulfate	336	mg/l	5.00	ASTM D516-07	7 Jun 18 15:5	
Chloride	24.9	mg/l	1.0	SM4500-C1-E	31 May 18 17:2	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:2	
Total Dissolved Solids	832	mg/l	10	11750-85	1 Jun 18 8:5	
Calcium - Total	107	mg/l	1.0	6010D	12 Jun 18 15:2	
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 9:1	
Boron - Total	0.35	mg/1	0.10	6010D	14 Jun 18 15:1	
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:3	
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:3	
Barium - Total	0.0286	mg/1	0.0020	6020B	12 Jun 18 11:3	
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:3	
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:3	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:3	
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:3	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:3	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:3	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:3	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:3	9 BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to con
! = Due to sample quantity + = Due to in

# = Due to concentration of other analytes
+ = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Report Date: 28 Jun 18 Lab Number: 18-W1409 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 17:27 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW105

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed		Analyst	
pH - Field	7.32	units	NA	SM 4500 H+ B	30 May 18	17:27	DJN	-
pH	* 7.7	units	0.1	SM4500 H+ B	6 Jun 18	17:00	svs	
Temperature - Field	11.8	Degrees C	NA	SM 2550B	30 May 18		DJN	
Conductivity - Field	1644	umhos/cm	1	EPA 120.1	30 May 18	17:27	DJN	
Fluoride	0.73	mg/1	0.10	SM4500-F-C	6 Jun 18	17:00	SVS	
Sulfate	686	mg/1	5.00	ASTM D516-07	7 Jun 18	15:54	EMS	
Chloride	26.0	mg/1	1.0	SM4500-C1-E	31 May 18		RAG	
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 Jun 1	11:27	EV	
Total Dissolved Solids	1180	mg/1	10	11750-85	1 Jun 1	8:55	SVS	
Calcium - Total	96.0	mg/l	1.0	6010D	12 Jun 1	15:20	SZ	
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 1		SZ	
Boron - Total	1.78	mg/1	0.10	6010D	14 Jun 1	15:14	SZ	
Antimony - Total	0.0014	mg/l	0.0010	6020B	12 Jun 1	11:39	BT	
Arsenic - Total	0.0021	mg/1	0.0020	6020B	12 Jun 1	11:39	BT	
Barium - Total	0.0235	mg/l	0.0020	6020B	12 Jun 1		BT	
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 1		BT	
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 1	11:39	BT	
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 1	11:39	BT	
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 1	3 11:39	BT	
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 1	3 11:39	BT	
Molybdenum - Total	0.0236	mg/l	0.0020	6020B	12 Jun 1	11:39	BT	
Selenium - Total	0.0414	mg/l	0.0050	6020B	12 Jun 1	3 11:39	BT	
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 1	11:39	BT	

\* Holding time exceeded

Approved by:

Clauditte K Canteo 28 Jun 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



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Page: 11 of 18

Report Date: 28 Jun 18 Lab Number: 18-W1410 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 18:58 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW106

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.42	units	NA	SM 4500 H+ B	30 May 18 18:58	DJN
Hq	* 7.7	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	13.8	Degrees C	NA	SM 2550B	30 May 18 18:58	DJN
Conductivity - Field	2669	umhos/cm	1	EPA 120.1	30 May 18 18:58	DJN
Fluoride	1.87	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	svs
Sulfate	1450	mg/l	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	33.1	mg/1	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	2270	mg/1	10	I1750-85	1 Jun 18 8:55	svs
Calcium - Total	129	mg/1	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	0.14	mg/1	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	4.92	mg/1	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0294	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0576	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0734	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Claudette K. Currep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

Due to sample matrix
 Due to sample quantity

# = Due to concentration of other analytes + = Due to internal standard response



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Page: 12 of 18

Report Date: 28 Jun 18 Lab Number: 18-W1411 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 12:55 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW107

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.36	units	NA	SM 4500 H+ B	30 May 1		DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 1		svs
Temperature - Field	9.85	Degrees C	NA	SM 2550B	30 May 1		DJN
Conductivity - Field	1378	umhos/cm	1	EPA 120.1	30 May 1	8 12:55	DJN
Fluoride	0.75	mg/1	0.10	SM4500-F-C	6 Jun 1	B 17:00	SVS
Sulfate	377	mg/l	5.00	ASTM D516-07	7 Jun 1	8 15:54	EMS
Chloride	17.5	mg/1	1.0	SM4500-C1-E	31 May 1	8 17:20	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 Jun 1	8 11:27	EV
Total Dissolved Solids	887	mg/l	10	11750-85	1 Jun 1	8 8:55	svs
Calcium - Total	62.6	mg/l	1.0	6010D	12 Jun 1	8 15:20	SZ
Lithium - Total	< 0.1	mg/1	0.10	6010D	13 Jun 1	8 10:10	SZ
Boron - Total	0.19	mg/1	0.10	6010D	14 Jun 1	8 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 1	8 11:39	BT
Arsenic - Total	0.0449	mg/l	0.0020	6020B	12 Jun 1	8 11:39	BT
Barium - Total	0.0456	mg/l	0.0020	6020B	12 Jun 1	8 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 1	8 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 1	8 11:39	BT
Chromium - Total	0.0021	mg/1	0.0020	6020B	12 Jun 1	8 11:39	BT
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 1	8 11:39	BT
Lead - Total	0.0015	mg/1	0.0005	6020B	12 Jun 1	8 11:39	BT
Molybdenum - Total	0.0081	mg/1	0.0020	6020B	12 Jun 1	8 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun 1	8 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 1	8 11:39	BT

\* Holding time exceeded

Approved by:

Claudette K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW108

Event and Year: Spring 2018

Report Date: 28 Jun 18 Lab Number: 18-W1412 Work Order #: 82-1191 Account #: 002800

Date Sampled: 31 May 18 11:19 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.83	units	NA	SM 4500 H+ B	31 May 18 11:19	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	6 Jun 18 17:00	SVS
Temperature - Field	14.2	Degrees C	NA	SM 2550B	31 May 18 11:19	DJN
Conductivity - Field	5368	umhos/cm	1	EPA 120.1	31 May 18 11:19	DJN
Fluoride	0.41	mq/1	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	4000	mg/1	5.00	ASTM D516-07	7 Jun 18 15:54	EMS
Chloride	39.7	mg/l	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Total Dissolved Solids	5520	mg/l	10	11750-85	1 Jun 18 8:55	svs

\* Holding time exceeded

Approved by:

Claudette K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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# = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



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CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW109

Event and Year: Spring 2018

Report Date: 28 Jun 18 Lab Number: 18-W1413 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 15:27 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analy:	ed	Analyst
pH - Field	7.32	units	NA	SM 4500 H+ B	30 May	18 15:27	
Н	* 7.8	units	0.1	SM4500 H+ B		18 17:00	
Temperature - Field	14.7	Degrees C	NA	SM 2550B	30 May	18 15:27	DJN
Conductivity - Field	1669	umhos/cm	1	EPA 120.1	30 May	18 15:27	DJN
Fluoride	0.75	mg/l	0.10	SM4500-F-C	6 Ju	18 17:00	SVS
Sulfate	670	mg/1	5.00	ASTM D516-07	7 Ju	18 15:54	EMS
Chloride	27.9	mg/1	1.0	SM4500-C1-E	31 May	18 17:20	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 Jui	1 18 11:27	EV
Total Dissolved Solids	1210	mg/1	10	11750-85	1 Ju	1 18 8:55	
Calcium - Total	103	mg/1	1.0	6010D	12 Ju	1 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Ju	1 18 10:10	SZ
Boron - Total	1.76	mg/l	0.10	6010D	14 Jui	1 18 15:14	
Antimony - Total	0.0064	mg/l	0.0010	6020B	12 Ju	1 18 11:39	BT
Arsenic - Total	0.0028	mg/l	0.0020	6020B	12 Ju	1 18 11:39	BT
Barium - Total	0.0276	mg/l	0.0020	6020B	12 Ju	1 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Ju	1 18 11:35	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Ju	1 18 11:39	BT
Chromium - Total	< 0.002	mg/l	0.0020	6020B	12 Ju	1 18 11:35	BT
Cobalt - Total	0.0071	mg/1	0.0020	6020B	12 Ju	1 18 11:35	BT
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Ju	18 11:39	BT
Molybdenum - Total	0.0280	mg/1	0.0020	6020B	12 Ju	1 18 11:39	BT
Selenium - Total	0.0527	mg/1	0.0050	6020B	12 Ju	18 11:35	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Ju	18 11:3	BT

\* Holding time exceeded

Approved by:

Clauditte K Currep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit



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Report Date: 28 Jun 18 Lab Number: 18-W1414 Work Order #: 82-1191

Account #: 002800

Date Sampled: 31 May 18 10:26 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW116

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.40	units	NA	SM 4500 H+ B	31 May 18 10:26	DJN
pH	* 7.8	units	0.1	SM4500 H+ B	6 Jun 18 17:00	svs
Temperature - Field	12.1	Degrees C	NA	SM 2550B	31 May 18 10:26	DJN
Conductivity - Field	2469	umhos/cm	1	EPA 120.1	31 May 18 10:26	DJN
Fluoride	1.12	mg/1	0.10	SM4500-F-C	6 Jun 18 17:00	svs
Sulfate	1260	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	41.1	mg/1	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245,1	6 Jun 18 11:27	EV
Total Dissolved Solids	2110	mg/l	10	11750-85	1 Jun 18 8:55	svs
Calcium - Total	159	mg/1	1.0	6010D	12 Jun 18 15:20	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	2.58	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0021	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0472	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0025	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0181	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Claudate K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to con

: = Due to sample quantity + = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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Report Date: 28 Jun 18 Lab Number: 18-W1415 Work Order #: 82-1191 Account #: 002800

Date Sampled: 31 May 18 8:35 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: Sewage Lagoon

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.89	units	NA	SM 4500 H+ B	31 May 18 8:35	DJN
Hq	* 8.0	units	0.1	SM4500 H+ B	6 Jun 18 17:00	svs
Temperature - Field	20.3	Degrees C	NA.	SM 2550B	31 May 18 8:35	DJN
Conductivity - Field	3552	umhos/cm	1	EPA 120.1	31 May 18 8:35	DJN
Fluoride	1.16	mg/1	0.10	SM4500-F-C	6 Jun 18 17:00	svs
Sulfate	2140	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	65.8	mg/l	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	3610	mg/l	10	11750-85	1 Jun 18 8:55	svs
Calcium - Total	186	mg/l	1.0	6010D	19 Jun 18 14:00	BT
Lithium - Total	0.10	mg/1	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	8.94	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	0.0031	mg/1	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0117	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.1060	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	0.0205	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	0.0101	mg/l	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT

\* Holding time exceeded

Approved by:

Clauditte K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

Rf. - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### Due to complete the configuration of the

# = Due to concentration of other analytes
\* = Due to internal standard response



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Report Date: 28 Jun 18 Lab Number: 18-W1416 Work Order #: 82-1191

Account #: 002800 Date Sampled: 30 May 18 10:35

Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: SP1

Event and Year: Spring 2018

	As Receive Result	As Received Result		Method Reference	Date Analyzed	Analyst
pH - Field	7.87	units	NA	SM 4500 H+ B	30 May 18 10:35	DJN
pH	* 8.1	units	0.1	SM4500 H+ B	6 Jun 18 17:00	svs
Temperature - Field	17.7	Degrees C	NA	SM 2550B	30 May 18 10:35	DJN
Conductivity - Field	789	umhos/cm	1	EPA 120.1	30 May 18 10:35	DJN
Fluoride	0.30	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	svs
Sulfate	176	mg/l	5.00	ASTM D516-07	15 Jun 18 9:16	EMS
Chloride	17.6	mg/l	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	474	mg/l	10	11750-85	1 Jun 18 8:55	SVS
Calcium - Total	55.0	mg/l	1.0	6010D	21 Jun 18 9:01	BT
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	0.15	mg/l	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0054	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.1056	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0066	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	0.0024	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0033	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

<sup>\*</sup> Holding time exceeded

Approved by:

Claudette K. Cantep

60 28 Jun 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to concentration of other analytes

! = Due to sample quantity # = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Report Date: 28 Jun 18 Lab Number: 18-W1417 Work Order #: 82-1191 Account #: 002800

Date Sampled: 30 May 18 10:56 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

PO #: 169917 OP Line 1

Temp at Receipt: 1.0C

CERTIFICATE of ANALYSIS - CCR

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: SP2

Event and Year: Spring 2018

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.78	units	NA	SM 4500 H+ B	30 May 18 10:56	DJN
pH	* 8.1	units	0.1	SM4500 H+ B	6 Jun 18 17:00	svs
Temperature - Field	17.8	Degrees C	NA	SM 2550B	30 May 18 10:56	DJN
Conductivity - Field	793	umhos/cm	1	EPA 120.1	30 May 18 10:56	DJN
Fluoride	0.31	mg/l	0.10	SM4500-F-C	6 Jun 18 17:00	SVS
Sulfate	182	mg/l	5.00	ASTM D516-07	15 Jun 18 9:36	EMS
Chloride	18.2	mg/1	1.0	SM4500-C1-E	31 May 18 17:20	RAG
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	6 Jun 18 11:27	EV
Total Dissolved Solids	512	mg/1	10	11750-85	1 Jun 18 8:55	svs
Calcium - Total	59.4	mg/l	1.0	6010D	21 Jun 18 9:01	BT
Lithium - Total	< 0.1	mg/l	0.10	6010D	13 Jun 18 10:10	SZ
Boron - Total	0.16	mg/1	0.10	6010D	14 Jun 18 15:14	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	12 Jun 18 11:39	BT
Arsenic - Total	0.0052	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Barium - Total	0.0983	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	12 Jun 18 11:39	BT
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Chromium - Total	0.0047	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	12 Jun 18 11:39	BT
Lead - Total	0.0025	mg/l	0.0005	6020B	12 Jun 18 11:39	BT
Molybdenum - Total	< 0.005 ^	mg/1	0.0020	6020B	12 Jun 18 11:39	BT
Selenium - Total	< 0.005	mg/1	0.0050	6020B	12 Jun 18 11:39	BT
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	12 Jun 18 11:39	BT

<sup>\*</sup> Holding time exceeded

Approved by:

Clauditte 28 JUN 18 K Canteo

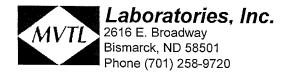
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

<sup>\*</sup> Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



## **Chain of Custody Record**

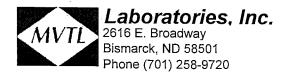
Project Nam	e:	Event:	Work Order Number:
	MDU Lewis and Clark	Spring 2018	8 - 1191
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Parren Nieswang

	Sampl	e Information			В	ottl	е Тур	е		Fi	eld Para	meters	Analysis
Lab Number	Sample ID	Date Time	Sample Type	1 liter	500mL Nitric		250 mL Sulfuric	//		Temp (°C)	Spec. Cond.	Fa	Analysis Required
W1400	Dup 1	30/2018 NA	GW	Х	Х		х			NA	NA	NA	
W1401	Field Blank (FB) 🤌	29,930, may 18 NA	GW	Х	Х	x	х			NA	NA	NA	
WIMOS	MW103	29May18 1454	GW	Х	Х	x	Х			12.78	1476	7.33	
	₩W110	29/10/18 1400	GW	×	X	×	*		C	Obstru		7 7 7 8	
WMU3	MW119	29May 18 1258	GW	Х	Х	x	х			10,63		7,34	
MONEY	MW111	29 May 18 1729	GW	х	Х	x	x		- 1		2997		MDU L&C Spring 2018
	MW117	29May 18 1610	GW	ж.	X	×	×			,	trust	A	
LMOS	MW118	30May18 0835	GW	х			x			12,77		7.45	
90MC	MW120	29 May 18 1914	GW	Х	Х	х	Х					6.88	
		,											
									1				

Comments: \$ 30may 18 DAG

Ĺ	Relinquished By:		Saı	mple Condition:
Ţ	Name:	Date/Time	Location:	Temp (°C)
	1 Dan Na	31May 18	Log In Walk In #2	1.0 TM562/TM805
	2			

	Recei	ved by:
	/ Name:	Date/Time
grant.	ind Xh	.31 Nay 2018 1688



## Chain of Custody Record

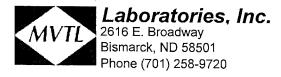
Project Name:		Event:	Work Order Number:				
	MDU Lewis and Clark	Spring 2018	82-1191				
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Dallen Nieswaas	>			

	Sampl	e Informatio	n			Во	ttle Typ	е	Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	$D_{ale}$	Time	Sample Type	1 lier	500mL Nitric	250 mL Sulfuric		<sup>T</sup> emp (°C)	Spec. Cond.	Ha	Analysis Required
WHET	Dup2	30May18	NA	GW	Х	ХХ			NA	NA	NA	
M1408	MW101	30MAY18	1416	GW	Х	ХХ	X		14.88	1266	7.39	
POPICI	MW105	30may 18	1727	GW	X	ХХ	X		11.77		7.32	
OIPIC	MW106	30/10/18	1858	GW	X	ХХ	X		13,80		7.42	
1111	MW107	39/1ay18	1255	GW	X	ХХ	X		9,85	1378	7.36	
121412	MW108	31 May18	1199	GW	X4	××	- X		14.25	5368	6.83	MDU L&C Spring 2018
EIPIGI	MW109	30May18	15207	GW	X	ХХ	X		14.66	1669	7.32	
MINICI	MW116	31 May 18	1026	GW	, х	ХХ	X			2469	7.40	:
*	*M <del>VV210</del>	حينت	— ※	<del>-6₩</del>	XX	-X X	<del>  ×</del>		No Sa			
										,		

Comments: \$30/0/18 OND \$3/May [80/0)

Relinquished By:		Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)			
1 Dan Ning	31 May 18	√og In Walk In #2	1, 0 TM562 / (M805)			
2						

Received I	oy:
/ ∧Name:	Date/Time
LOW XIL	31May 2018
)	



# **Chain of Custody Record**

Project Name:		Event:	Work Order Number:	
	MDU Lewis and Clark	Spring 2018	80-1191	
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Nieswaas	

Sample Information						Bottle Type				Field Parameters			Analysis			
Lab Number	Sample ID	Date	Time	Sample Type		1 liter	500ml s.	500ml Air	250 ml Confinered)	Sulfuric	//		Temp (°C)	Spec. Cond.	-Early	Analysis Required
	West Scrubber Pond	31 may 18	1105	SW		1										
WIYIS	Sewage Lagoon	31may18	0875	sw		Х	Х	Х	Х			2	0,29	3552	17.89	
		/														
WIMIG	SP1	30May18	1035	SW		X	Х	Х	Х			15	7.73	789	7.87	
IMI	SP2	30, may 18	1056	sw		X	Х	Х	Х			115	7,77	793	7:78	
			_													MDU L&C Spring 2018
	Manager 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1															

Comments: \* BIMay 18 ON (8)

Relinquished By:	Sample Condition:			
Name:	Date/Time	Location:	Temp (°C)	
1 Jan Nie	31Mmy15	Log In Walk In #2	10 TM805 TM5027 TM805	
2				

Received	by:
/Name:	Date/Time
1000 (OH)	31/20 2012
LWW XV	7 1008



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#### CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-1193

Client: Montana Dakota Utilities

Location: MDU Lewis & Clark

Project Identification: CCR Radiochem Spring 2018
MVTL Laboratory Identifications: 18-W1421 through 18-W1430

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #		
Dup 1	18-W1421		
Field Blank (FB)	18-W1422		
MW103	18-W1423		
MW110	No sample		
MW119	18-W1424 18-W1425 No sample 18-W1426		
MW111			
MW117			
MW118			
MW120	18-W1427		
Scrubber Pond	No sample		
Sewage Lagoon	18-W1428 18-W1429		
SP1			
SP2	18-W1430		

### I. RECEIPT

- All samples were received at the laboratory on 31 May 2018 at 1608.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 1.0°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 5 Jun 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

### II. HOLDING TIMES

 All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

### III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.



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### CASE NARRATIVE

-MVTL Lab Reference No/SDG:

201882-1193

Client:

Montana Dakota Utilities

Location:

MDU Lewis & Clark

Project Identification:

CCR Radiochem Spring 2018

MVTL Laboratory Identifications:

18-W1421 through 18-W1430

Page 2 of 2

#### IV. **ANALYSIS**

All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

DATE: 13 TUL 18

Claudette Carroll - MVTL Bismarck Laboratory Manager



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Event and Year: Spring 2018

Sample Description: Dup 1

Page: 1 of 1

Report Date: 13 Jul 18 Lab Number: 18-W1421 Work Order #: 82-1193 Account #: 002800

Date Sampled: 30 May 18

Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			21 Jun 18	OL
Radium 228	See Attached Report			3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Canteo

10 13 JUL 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Nethod Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to concentration of other analytes

### Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr

Report Date: 13 Jul 18 Lab Number: 18-W1422 Work Order #: 82-1193 Account #: 002800 Date Sampled: 30 May 18

1 of 1

Page:

Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

Project Name: MDU Lewis & Clark Sample Description: Field Blank (FB)

Billings MT 59102

Event and Year: Spring 2018

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226 Radium 228	See Attached Report See Attached Report			21 Jun 18 3 Jul 18	OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix

# = Due to compare the control of the contr

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW103

Event and Year: Spring 2018

Page: 1 of 1

Report Date: 13 Jul 18 Lab Number: 18-W1423 Work Order #: 82-1193 Account #: 002800

Date Sampled: 29 May 18 14:54 Date Received: 31 May 18 16:08

Sampled By: Client

Temp at Receipt: 1.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	29 May 18 14:54	
Temperature - Field	12.8	Degrees C	NA	SM 2550B	29 May 18 14:54	DJN
Conductivity - Field	1476	umhos/cm	1	EPA 120.1	29 May 18 14:54	DJN
		ached Report			21 Jun 18	OL
Radium 226 Radium 228		ached Report			3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix

### Due to compare the property is a pull to incompare the property in the pull to incompare the pull to in

|| = Due to concentration of other analytes | = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW119

Event and Year: Spring 2018

Page: 1 of 1

Report Date: 13 Jul 18 Lab Number: 18-W1424 Work Order #: 82-1193 Account #: 002800

Date Sampled: 29 May 18 12:58 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Rece: Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228		units Degrees C umhos/cm ached Report ached Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	29 May 18 12:58 29 May 18 12:58 29 May 18 12:58 29 May 18 12:58 21 Jun 18 3 Jul 18	DJN

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clanditte K Cantes 13JUL18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to condition as coded below:

# = Due to sample quantity # = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW111

Event and Year: Spring 2018

1 of 1 Page:

Report Date: 13 Jul 18 Lab Number: 18-W1425 Work Order #: 82-1193 Account #: 002800

Date Sampled: 29 May 18 17:29 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
n ni -3.4	7.24	units	NA	SM 4500 H+ B	29 May 18 17:29	DJN
pH - Field	12.7	Degrees C	NA	SM 2550B	29 May 18 17:29	DJN
Temperature - Field	2997	umhos/cm	1	EPA 120.1	29 May 18 17:29	
Conductivity - Field		ached Report		2110 11110	21 Jun 18	OL
Radium 226 Radium 228		ached Report			3 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### Due to complete the control of the contr

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW118

Event and Year: Spring 2018

Page: 1 of 1

Report Date: 13 Jul 18 Lab Number: 18-W1426 Work Order #: 82-1193 Account #: 002800

Date Sampled: 30 May 18 8:35 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Reces	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228	Contraction of the Contraction	units Degrees C umhos/cm ached Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	30 May 18 30 May 18 30 May 18 21 Jun 18 3 Jul 18	DJN DJN OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to concentration of other analytes

! = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: Spring 2018

1 of 1 Page:

Report Date: 13 Jul 18 Lab Number: 18-W1427 Work Order #: 82-1193 Account #: 002800

Date Sampled: 29 May 18 19:14 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
Tu 81-13	6.00	units	NA	SM 4500 H+ B	29 May 18 19:14	DJN
pH - Field	6.88		67.7		29 May 18 19:14	
Temperature - Field	9.89	Degrees C	NA	SM 2550B		
Conductivity - Field	3761	umhos/cm	1	EPA 120.1	29 May 18 19:14	DJN
그 그 그 아이들이 있는 것이 없는데 그렇게 하는데 그 아이들이 되었다면 하다.	A 1 0 00	ached Report			21 Jun 18	OL
Radium 226						
Radium 228	See Att	ached Report			4 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K Canto 135VL18

Claudette K, Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

# = Due to concentration of other analytes + = Due to internal standard response



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Page:

Report Date: 13 Jul 18 Lab Number: 18-W1428 Work Order #: 82-1193 Account #: 002800

1 of 1

Date Sampled: 31 May 18 8:35 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: Sewage Lagoon

Event and Year: Spring 2018

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field Temperature - Field Conductivity - Field Radium 226 Radium 228		units Degrees C umhos/cm ached Report ached Report	NA NA 1	SM 4500 H+ B SM 2550B EPA 120.1	31 May 18 31 May 18 31 May 18 21 Jun 18 4 Jul 18	8:35 8:35 8:35	DJN DJN DJN OL OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K Canteo

14

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### = Due to co

| = Due to sample quantity ### Due to in

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: SP1

Event and Year: Spring 2018

1 of 1 Page:

Report Date: 13 Jul 18 Lab Number: 18-W1429 Work Order #: 82-1193 Account #: 002800

Date Sampled: 30 May 18 10:35 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

Temp at Receipt: 1.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.87	units	NA	SM 4500 H+ B	30 May 18 10:35	DJN
Temperature - Field	17.7	Degrees C	NA	SM 2550B	30 May 18 10:35	DJN
Conductivity - Field	789	umhos/cm	1	EPA 120.1	30 May 18 10:35	DJN
Radium 226		ached Report			21 Jun 18	OL
Radium 228	# 17 (E.   DOT 17)	ached Report			4 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

13JUL 18 Claudette K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix

### Due to complete the control of the cont

| = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: SP2

Event and Year: Spring 2018

Page: 1 of 1

Report Date: 13 Jul 18 Lab Number: 18-W1430 Work Order #: 82-1193 Account #: 002800

Date Sampled: 30 May 18 10:56 Date Received: 31 May 18 16:08 Sampled By: MVTL Field Services

PO #: 169917 OP Line 1

Temp at Receipt: 1.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.78	units	NA	SM 4500 H+ B	30 May 18 10:56	DJN
Temperature - Field	17.8	Degrees C	NA	SM 2550B	30 May 18 10:56	DJN
Conductivity - Field	793	umhos/cm	1	EPA 120.1	30 May 18 10:56	DJN
Radium 226	6.5.5	ached Report		200	21 Jun 18	OL
Radium 228		ached Report			4 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudate K Canto 13 Jn 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + \* Due to internal standard response



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 7/5/2018

**CLIENT:** 

MVTL Laboratories, Inc.

Project:

201882-1193

Lab Order:

S1806044

**CASE NARRATIVE** 

Report ID: S1806044001

Samples 18-W1421 Dup 1, 18-W1422 Field Blank (FB), 18-W1423 MW103, 18-W1424 MW119, 18-W1425 MW111, 18-W1426 MW118, 18-W1427 MW120, 18-W1428 Sewage Lagoon, 18-W1429 SP1 and 18-W1430 SP2 were received on June 5, 2018.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition 40 CFR Parts 136 and 141 40 CFR Part 50, Appendices B, J, L, and O Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012 ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Qualifiers by sample

S1805521-001 - Radium 226 in Water -/Radium 226 - Spike Recovery outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-001 ClientSample ID: 18-W1421 Dup 1

COC:

201882-1193

PWS ID: Comments Date Reported 7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/30/2018

DateReceived:

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1414	МВ
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1414	МВ
Radium 228	-0.6	pCi/L		1	Ga-Tech	07/03/2018 812	WN
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	07/03/2018 812	WN

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Holding times for preparation or analysis exceeded Н

Analyzed by another laboratory

Not Detected at the Reporting Limit ND

Spike Recovery outside accepted recovery limits

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 10



1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-002 ClientSample ID: 18-W1422 Field Blank (FB)

COC:

PWS ID:

201882-1193

Comments

WorkOrder: CollectionDate: 5/30/2018

Report ID

Date Reported

S1806044

S1806044001

7/5/2018

DateReceived: 6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1414	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	06/21/2018 1414	MB
Radium 228	0.3	pCi/L		1 .	Ga-Tech	07/03/2018 1116	WN
Radium 228 Precision (±)	3.2	pCi/L			Ga-Tech	07/03/2018 1116	WN

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

Not Detected at the Reporting Limit ND

Spike Recovery outside accepted recovery limits

Matrix Effect

**RL - Reporting Limit** 

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 10



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-003

ClientSample ID: 18-W1423 MW103

COC:

201882-1193

PWS ID: Comments Date Reported

7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/29/2018 2:54:00 PM

DateReceived:

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	0.9	pCi/L		1	Ga-Tech	07/03/2018 1420	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	07/03/2018 1420	WN

### These results apply only to the samples tested.

### Qualifiers:

- В Analyte detected in the associated Method Blank
  - Value above quantitation range
- Holding times for preparation or analysis exceeded Н
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits
- Matrix Effect

### **RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 of 10



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-004

ClientSample ID: 18-W1424 MW119 COC:

PWS ID:

201882-1193

Comments

Date Reported

7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/29/2018 12:58:00 PM

DateReceived:

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/l	d/Init	
Radionuclides - Total								
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	МВ	
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	06/21/2018 1630	МВ	
Radium 228	-1.4	pCi/L		1	Ga-Tech	07/03/2018 1723	WN	
Radium 228 Precision (±)	1.9	pCi/L			Ga-Tech	07/03/2018 1723	WN	

### These results apply only to the samples tested.

Qualifiers:

- В Analyte detected in the associated Method Blank
- Value above quantitation range
- Н Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

### **RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Page 4 of 10



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-005 ClientSample ID: 18-W1425 MW111

COC:

PWS ID:

201882-1193

Comments

Date Reported 7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/29/2018 5:29:00 PM

DateReceived: 6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Comments	-						
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	0.1	pCi/L		1	Ga-Tech	07/03/2018 2025	WN
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/03/2018 2025	WN

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Holding times for preparation or analysis exceeded Н

Analyzed by another laboratory

Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 5 of 10



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-006

ClientSample ID: 18-W1426 MW118

COC:

201882-1193

PWS ID:

Date Reported 7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/30/2018 8:35:00 AM

DateReceived:

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1630	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1630	MB
Radium 228	-0.7	pCi/L		1	Ga-Tech	07/03/2018 2328	WN
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	07/03/2018 2328	WN

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 6 of 10



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave. Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-007

COC:

201882-1193

PWS ID:

ClientSample ID: 18-W1427 MW120

7/5/2018

Date Reported Report ID

ph: (307) 672-8945

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/29/2018 7:14:00 PM

6/5/2018 11:50:00 AM

DateReceived: FieldSampler:

Matrix:

Water

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	0.4	pCi/L		1	Ga-Tech	07/04/2018 230	WN
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/04/2018 230	WN

### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Holding times for preparation or analysis exceeded Н
- Analyzed by another laboratory
- Not Detected at the Reporting Limit ND
- Spike Recovery outside accepted recovery limits
- Matrix Effect

### **RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 7 of 10

S1806044001

6/5/2018 11:50:00 AM

S1806044

CollectionDate: 5/31/2018 8:35:00 AM



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

Company: MVTL Laboratories, Inc.

2616 E Broadway Ave. Bismarck, ND 58501

ProjectName:

201882-1193 S1806044-008

ClientSample ID: 18-W1428 Sewage Lagoon

COC:

Lab ID:

201882-1193

PWS ID:

FieldSampler:

Matrix: Water

Date Reported 7/5/2018

Report ID

WorkOrder:

DateReceived:

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.19	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	МВ
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	МВ
Radium 228	-3.0	pCi/L		1	Ga-Tech	07/04/2018 533	WN
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	07/04/2018 533	WN

### These results apply only to the samples tested.

Qualifiers:

В Analyte detected in the associated Method Blank

Value above quantitation range

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Matrix Effect

Reviewed by:

### **RL** - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL

Outside the Range of Dilutions

Analysis reported under the reporting limit

Wade Nieuwsma, Assistant Laboratory Manager

Page 8 of 10



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-009 ClientSample ID: 18-W1429 SP1

COC:

PWS ID:

201882-1193

CollectionDate: 5/30/2018 10:35:00 AM

Report ID

DateReceived:

Date Reported

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

WorkOrder:

Water

7/5/2018

S1806044

S1806044001

С	o	n	1	n	1	е	n	ts

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.15	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	-4.6	pCi/L		1	Ga-Tech	07/04/2018 836	WN
Radium 228 Precision (±)	2.6	pCi/L			Ga-Tech	07/04/2018 836	WN

### These results apply only to the samples tested.

### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Н Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Matrix Effect

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

### **RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Page 9 of 10



1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave. Bismarck, ND 58501

ProjectName:

201882-1193

Lab ID:

S1806044-010 ClientSample ID: 18-W1430 SP2

COC:

PWS ID:

201882-1193

Comments

Date Reported

7/5/2018

Report ID

S1806044001

WorkOrder:

S1806044

CollectionDate: 5/30/2018 10:56:00 AM

DateReceived:

6/5/2018 11:50:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
, and you	Nesuit	Omis	Quai	NL .	Wiethod	Date Analyzeu/init	
Radionuclides - Total							
Radium 226	0.18	pCi/L		0.2	SM 7500 Ra-B	06/21/2018 1631	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	06/21/2018 1631	MB
Radium 228	0.0	pCi/L		1	Ga-Tech	07/04/2018 1138	WN
Radium 228 Precision (±)	1,4	pCi/L			Ga-Tech	07/04/2018 1138	WN

These results apply only to the samples tested.

Qualifiers:

Analyte detected in the associated Method Blank

Value above quantitation range

Н Holding times for preparation or analysis exceeded

Analyzed by another laboratory

ND Not Detected at the Reporting Limit

Spike Recovery outside accepted recovery limits

Matrix Effect

**RL** - Reporting Limit

Calculated Value

Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

Value exceeds Monthly Ave or MCL or is less than LCL М

Outside the Range of Dilutions

Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 10 of 10



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** 

Work Order:

MVTL Laboratories, Inc.

S1806044

**Project:** 201882-1193

Date: 7/5/2018

Report ID: S1806044001

Radium 228 by Ga/Tech	Sample Type MBLK	Units: pCi/L	
MB-512 (07/02/18 16:53)	RunNo: 158826	PrepDate: 06/12/18 14:00 BatchID 14748	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits (	Qual
Total Radium 228	ND	1	
Radium 228 by Ga/Tech	Sample Type LCS	Units: pCi/L	
LCS-512 (07/02/18 19:57)	RunNo: 158826	PrepDate: 06/12/18 14:00 BatchID 14748	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits	Qua
Total Radium 228	33	1 39 85.7 65.9 - 132	
Radium 228 by Ga/Tech	Sample Type MS	Units: pCi/L	
MS-512 (07/03/18 02:04)	RunNo: 158826	PrepDate: 06/12/18 14:00 BatchID 14748	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits	Qua
Total Radium 228	36	1 39 ND 92.0 50 - 139	
adium 228 by Ga/Tech	Sample Type MSD	Units: pCi/L	
MSD-512 (07/03/18 05:08)	RunNo: 158826	PrepDate: 06/12/18 14:00 BatchID 14748	
Analyte	Result	RL Conc %RPD %REC % RPD Limits (	Qua
Total Radium 228	45	1 36 21.9 115 20	
adium 226 in Water -	Sample Type MBLK	Units: pCi/L	
MB-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00 BatchID 14701	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits (	Qual
Radium 226	ND	0.2	
adium 226 in Water -	Sample Type LCS	Units: pCi/L	
LCS-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00 BatchID 14701	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits (	Qual
Radium 226	6.4	0.2 6.95 91.8 67.1 - 122	
adium 226 in Water -	Sample Type LCSD	Units: pCi/L	
LCSD-1869 (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00 BatchID 14701	
Analyte	Result	RL Conc %RPD %REC % RPD Limits 0	Qual
Radium 226	6.6	0.2 6.4 3.39 95.0 20	
adium 226 in Water -	Sample Type MS	Units: pCi/L	
S1805521-001CMS (06/21/18 14:14)	RunNo: 158550	PrepDate: 06/06/18 0:00 BatchID 14701	
Analyte	Result	RL Spike Ref Samp %REC % Rec Limits (	Qual
•			

Qualifiers:

B Analyte detected in the associated Method Blank

G Analyzed at IML Gillette laboratory

Analyte detected below quantitation limits

ND Not Detected at the Reporting Limit

R RPD outside accepted recovery limits

X Matrix Effect

E Value above quantitation range

H Holding times for preparation or analysis exceeded

L Analyzed by another laboratory

O Outside the Range of Dilutions

S Spike Recovery outside accepted recovery limits



### *LABORATORIES, Inc.* 2616 E Broadway Ave Bismarck, ND 58501

### **Chain of Custody Record**

P	age	1	of	1	_
8	ayıc	E .	~ ·	8	

Tall France (9		(701) 258-97									201882-1193		
Company Nam		Fax: (701) 258-9724											
Company Nam	e and Address	5.		Account #:							Phone #: 701-258-9720		
		MVTL		Contact:		··········					Fax #:		
	<u>261</u>	6 E Broadway		o o made.	Claud	ette					For faxed report check box		
		arck, ND 58501		Name of Sa	mpler:						E-mail: ccarroll@mvtl.com		
Billing Address	s (indicate if d	ifferent from above):									For e-mail report check box		
	-	O Box 249		Quote Numi	ber						Date Submitted:		
		D-1-4 N	- (NTI						06/01/2018				
	<u>New</u>		Project Nam	ie/Number	:					Purchase Order #: BL6057			
	•		4			В	ottle	Ту	ре	Analysis			
5180604													
IML Lab	MVTL Lab		Commis	Dete	<b>T</b> i	ated	ml HNO3	VOC Vials Umpreserved	Jar				
Number	Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000	VOC	Glass Jar	Other	Analysis Required		
.001	18-W1421	Dup 1	GW	30-May-18	N/A						Ra226 & Ra228		
200_	18-W1422	Field Blank (FB)	GW	30-May-18	N/A						Ra226 & Ra228		
$\infty 3$	18-W1423	MW103	GW	29-May-18	1454						Ra226 & Ra228		
904	18-W1424	MW119	GW	29-May-18	1258						Ra226 & Ra228		
005	18-W1425	MW111	GW	29-May-18	1729						Ra226 & Ra228		
006	18-W1426	MVV118	GW	30-May-18	0835						Ra226 & Ra228		
007	18-W1427	MW120	GW	29-May-18	1914						Ra226 & Ra228		
800	18-W1428	Sewage Lagoon	SW	31-May-18	0835						Ra226 & Ra228		
009	18-W1429	SP1	SW	30-May-18	1035						Ra226 & Ra228		
010	18-W1430	SP2	sw	30-May-18	1056						Ra226 & Ra228		
Comments:											2 confrs		

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:		Temp:
N. Buchmann	06/01/2018	1700		Kathy Dayo	6.5.18	11:50	21.5
2.				<u></u>			21-1



**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	103
Sampling Personal:	Da Cran Willer

2010 L. Broadway Ave, Di	Silialck, ND						Sampling	Personal: ,	Darren 11	10540	a 6	
Phone: (701) 258-9	9720										7	
Weather Conditions:		Temp:	71 °F	Wind:	South	@ 5		Precip	: Sunr	y Partly	Cloudy / Clo	udy
	Well Info	rmation		_			s	ampling l	Informatio	on		
Well Locked?	Yes	(Ng)			Purgi	ng Method:	Bla	dder				
Well Labeled?	(es)	No	,		Sampli	ng Method:	Bla	dder		Co	ontrol Setting	S
Casing Straight?	(ES)	No			Dedicat	ted Equip?:	Yes	(No)		Purge:	5	sec.
Grout Seal Intact?	Yes	No	Not Visible	]	Duplicate	Sample?:	Yes	(No)		Recover:	55	sec.
Repairs Necessary:					Duplicate	Sample ID:	-			PSI:	-	
Casing	Diameter:		2"						- 			
Water Level Bef	ore Purge:	/	10.50 ft		F	Purge Date:	29 Ma	v 18	Time Purg	ing Began:	1404	am/ੴn
				_	Well P	urged Dry?	Yes	No	Time P	urged Dry:		am/pm
				_	Sa	mple Date:	29 Na	V180	Time of	Sampling:	1454	am/pm
Depth to Top	o of Pump:		8,44 ft					, 0				
Water Level Afte	er Sample:	i	10,5 1 ft		Bottle	1L Raw	500m	L Nitric	500mL Nitr	ic (filtered)	250 Su	lfuric
Measuremer	nt Method:	Electric	Water Level Indicator		List:				4 - 1L Nitric			
			<b></b> - , ,									

### Field Measurements

Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	ecutive)	(°C)	Cond.	рН	<sub>-դ.</sub> (mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1400	14,39	4225	7.31	0,2%	76.4	37.5	10,56	100	500	Slight Torbid
2	1474	13,01	#2163	7,33	0,21	77.8	27.7	10,55	100	1500	5
3	1439	13.23	15217	7,33	0,24	73.6	4,62	10,55	100	1500	clear
4	11444	13,32	1512	7,33	0,20	74.1	3,53	10155	100	500	dea
5	1449	12,94	1492	7,35	6, 19	75,3	3,73	10,55	100	500	Clear
6	1454	12,78	1476	7,33	0119	77,3	3,57	10,55	100	500	clear
7		1								,	
8											
9											
10											
C4 - L ::: d.	Vac	No						4-137 1		1-10 M	

Stabilized: Yes No
Comments

Total Volume Removed: 5000 mL



**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID: M 1/1	0
Sampling Personal:	

			Grounawa	101 7100	COO.	HOHE	Gample IB. /// // //					
2616 E. Broadway Ave, Bis	smarck, ND						Sampling Personal: Dayren N			Niesu		
Phone: (701) 258-9	9720										25	
/eather Conditions:		Temp:	70 °F	Wi	ind:	Light@		Precip	Suni	ny Partly C	loudy / Cl	oudy
	Well Info	ormation				/	Sa	ımpling	Informatio	on		
Well Locked?	Yes	No				Purging Method:	Blac	lder				
Well Labeled?	Xeş	No				Sampling Method:	Blac	lder		Co	ntrol Settin	gs
Casing Straight?	Yes	No				Dedicated Equip?:	Yes	No	Series.	Purge:		sec.
Grout Seal Intact?	<b> ∕</b> Yes	No	Not Visible			Duplicate Sample?:	Yes	No		Recover:		sec.
epairs Necessary:						Duplicate Sample ID:				PSI:		
Casing	Diameter:		2"									
Water Level Befo	ore Purge:		7,04	ft		Purge Date:			Time Purg	ing Began:		am/pm
						Well Purged Dry?	Yes	No	Time F	urged Dry:		am/pm
						Sample Date:	29May	18	Time of	Sampling:	1400	am/pm
Depth to Top	o of Pump:			ft			•					
Water Level Afte	er Sample:			ft		Bottle 1L Raw	500ml	. Nitric	500mL Niti	ic (filtered)	250 S	<del>ulfu</del> rie
Measuremen	nt Method:	Electric \	Water Level Indicato	<u>r</u>		List:		•	4-1L Nitric	*		

### Field Measurements

Stabiliz	ation	Temp	Spec.								Description:
(3 conse	(3 consecutive) (°C)		Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2			•						J		
3											
4											
5											
6											
7											
8								j	****		
9		Antenna de la compansión de la compansió	(Carlinguistre								
10											
tabilized:	Yes	No					Т	otal Volume	Removed:	r	mL

Comments:

Went to fat pump down the well and there is an obstruction around 9,10 just below water level. Bounced the pump to try to get by, but it won't go past.



Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	119	
Sampling Personal:	Darren Willrage	

Groundwate					Assess	ment		Sample ID	:	119				
2616 E. Broadway Ave, Bis Phone: (701) 258-9								Sampling I	Personal:	Darren	p/ies	ruay		
Filone. (701) 236-9	720													
Weather Conditions:		Temp:	66°F		Wind:	Vind: Light @ Precip: Sunny (Fartly Cloudy / C								
	Well Info	rmation						S	ampling	Informatio	on			
Well Locked?	Yes	/No				Purgi	ng Method:	Bla	dder					
Well Labeled?	(Yes)	No				Sampli	ng Method:	Bla	dder		Co	ntrol Setting	js	
Casing Straight?	Xes)	No				Dedica	ted Equip?:	Yes	No		Purge:	5	sec	
Grout Seal Intact?	(Yes	No	Not Visibl	e		Duplicate	Sample?:	Yes	(No)		Recover:	55	sec	
Repairs Necessary:						Duplicate	Sample ID:	_			PSI:			
Casing	Diameter:		2"											
Water Level Befo	ore Purge:	8	283	ft		F	ourge Date:	74M	4/8	Time Purg	ing Began:	1208	am/pn	
		<i>U</i> :				Well P	urged Dry?	Yes	/ Wo	Time F	urged Dry:		am/pn	
						Sa	mple Date:	29 Ma.	118	Time of	Sampling:	1258	am/pn	
Depth to Top	of Pump:	14	, 34	· ft				/						
Water Level Afte	r Sample:		8,90	ft		Bottle	1L Raw	500m	L Nitric	500mL Niti	ric (filtered)	250 St	Ilfuric	
Measurement	t Method:	Electric \	Water Level Indic	ator		List:				4 - 1L Nitric				
				Field	Measure	ements								

		<b>T</b>	0			000		18/ /			
Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	ecutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	₄ml/min		Clear, Slightly Turbid, Turbid
1	1213	11.98	1116	7,33	1,78	95.3	4.57	8.90	1500i00	500	Clear
2	1228	11,01	1111	734	0.74	RILL	4.80	8,40	100	1500	clea/
3	1233	10,79	1112	7.34		80.4	5.40	8,90	100	500	clear
4	1243	10.86	1116	7.34	0,89	78,4	3048	8290	100	1000	clea
5	1248	10.80	1119	7.33	0244	タグラ	2,04	8,90	100	500	c(ea_
6	1253	10.86	1119	7,34	0.43	77.3	1.93	8,90	100	500	elea-
7	1258	10.63	1118	7,34	0.98	76.6	1,88	8,90	100	500	clear
8				•							
9											
10											

Stabilized: Yes No
Comments: 2 dMay 18 0MA

Total Volume Removed: 5000 mL



### **Groundwater Assessment**

Company:		MDU Lewis and Clark	
Event:		Spring 2018	
Sample ID:	111		
Sampling Personal:	Ascomo	1/20/2/500	

								eample ib.						
2616 E. Broadway Ave, Bis	smarck, ND							Sampling Personal: Sarren Nieswaag						
Phone: (701) 258-9	720													
Weather Conditions:		Temp:	775°F		Wind: [	-ight	@		Precip	: Sunr	ny Partly C	Cloudy / Clo	udv	
,	Well Info	rmation						Sa	ampling	Informatio				
Well Locked?	Yes 🤇	(No)				Purgi	ng Method:	Blac	dder					
Well Labeled?	Xes)	No				Sampli	ng Method:	Blac	dder	1	Сс	ntrol Setting	s	
Casing Straight?	(Ves)	No				Dedicat	ted Equip?:	Yes	<b>©</b>		Purge:	5	sec.	
Grout Seal Intact?	¥es	No	Not Visible			Duplicate	Sample?:	Yes	<b>(6)</b>		Recover:	55-	sec.	
Repairs Necessary:						Duplicate	Sample ID:	**************************************			PSI:	<u>_</u>		
Casing	Diameter:		2"							<del>-</del>				
Water Level Befo	ore Purge:	7.	, 4)	ft		F	Purge Date:	29 Mar	d.S	Time Purg	ing Began:	1619	am/pfm	
						Well P	urged Dry?	Yes /	No)	Time F	urged Dry:		-am/pm	
						Sa	mple Date:	29Ma	Y18	Time of	Sampling:	1729	am/pm	
Depth to Top	of Pump:	<u> </u>	76	ft					, 0			t .		
Water Level Afte	er Sample:	7.	95	ft		Bottle	1L Raw	500ml	_ Nitric	500mL Nitr	ric (filtered)	250 Su	lfuric	
Measuremen	t Method:	Electric V	Vater Level Indicate	or		List:				4 - 1L Nitric				
			Fie	eld N	leasure	ments						-		
					000	- 1111			Ţ					

						measare					
Stabili	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	3 consecutive) (°C) Co		Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1624	13,42	3930	17.04	0,34	78.6	5173	7.98	100	500	Cla
2	1639	12.95	3750	テロチ	0.30	74.0	11.3	7,94	100	1500	clear
3	1649	12,80	3457	4.12	0,68	173,6	12.62	7.95	100	1000-	cles-
4	1704	12,31	3129	7.21	1,70	73.8	4.81	7,94	100	1500	clear
5	1214	12,38	3048	7.23	2,40	74,0	3,29	7.95	100		clean
6	1719	12,19	3013	7.24	2,24	74.3	1.24	7.95	100	500	clear-
7	1724	12,56	0 7995	7,25	2.81	743	1.15	7.95	100	500	Chi
8	1729	12,71	29907	7,24	2,91	74,4	1.15	7.95	100	000	Clear
9	, , ,	, , , ,			,			- t - 2	i		
10											
O. 1	1/20									700	

Stabilized: (Yes No

Total Volume Removed: 7000 mL



Company:	MDU Lewis and Clark							
Event:	Spring 2018							
Sample ID:	117							
Sampling Personal:	Darren VIEGNAGE							

	_			_						<u>`</u>				
				Grou	undwatei	r Assessi	ment		Sample ID:		117			
2616 E. Broa	adway Ave, Bi	ismarck, ND							Sampling P	ersonal:	Darren	Nicsa	MAG	
Phon	ie: (701) 258-9	9720								7				
Veather C	onditions:		Temp:	75	°F	Wind:	Light	@		Precip:	SID	Partly C	loudy / Cld	oudy
		Well Info	rmation						Sa	mpling l	nformatio			
We	ll Locked?	Yes	(No)				Purgi	ng Method:	Blac	lder				
Wel	l Labeled?	Xes	No				Sampli	ng Method:	Blag	lder		Co	ntrol Setting	gs _/
Casing	g Straight?	YFES	No				Dedicat	ted Equip?:	Yes	No		Purge:		sec.
Grout S	eal Intact?	Yes	No	Not V	isible		Duplicate	Sample?:	Yes	No		Recover:		sec.
epairs Necessary:							Duplicate	Sample IØ:				PSI;	/	
40.	Casing	Diameter:		2" /								(		
Wate	r Level Bef	fore Purge:		_/_	ft		F	Purge Date:			Time Purg	ing Began:		am/pm
			/				Well P	urged Dry?	Yes	No	Time P	urged Dry:		am/pm
			/_				Sa	mple Date:	29 May	-18	Time of	Sampling:	1610	am/pm
	epth to To	p of Pump:			ft									
Wate	er Level Aft	er Sample:			ft		Bottle	1L Raw	500mL	Nitric Nitric	500mL Nitr	ric (filtered)	250 Sເ	ulfuric
Measurement Method: Electric Water Level Indicator							List:				4 - 1L Nitric			
					Field	Measure	ments							
Stabili:	zation	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mĻ		Description:		
(3 consecutive) (°C)			Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Odo	****	
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, S	Slightly Turbid,	Turbid	
			1					,	•					

Stabiliz		Temp	Spec.		DO	ORP	Turbidity	}	Pumping	mL	Description:
(3 conse	cutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1											
2				,mer e							
3			,	/							
4											
5										parties of the same of the sam	
6											
7		/									
8											
9											
10		(.									
Stabilized:	Yes	No					ī	otal Volume	Removed:		mL

Comments:

rhen trying to get the cap off a section of lipe came up about a 2 fr section. The cap was on really tight, replaced cap. The Sand around the pipe Pell into the well and played it.



**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	
Sampling Personal:	Nicomaga

No

Stabilized:

Comments:

Pho	one: (701) 258-	9720					•						
Weather (	Conditions		Temp:	62	°F	Wind:	North	@ 6		Precip	: Sunn	y / Partly Cloudy(/Cl	oudy
		Well Infe	ormation						S	<u></u>	nformatio		
W	ell Locked?	Yes	(No				Purgi	ing Method:	T	dder			
We	ell Labeled?	Yes	No					ing Method:	Blac	dder	i r	Control Settin	as
Casir	ng Straight?	Yes	No				Dedicated Equip?:		Yes	No	1 1	Purge: 5	sec
Grout 9	Seal Intact?	Yes	No	Not \	/isible		Duplicate Sample?:		Yes	No	1	Recover: 55	sec
Repairs N	Repairs Necessary:				<u> </u>			Sample ID:	Dul	1	<b>†</b>	PSI:	
	Casing	g Diameter:		2''			<u> </u>		i is copy		j [	701.	
Wat	er Level Be	fore Purge:		8.61	ft		F	Purge Date:	30Me	11/8	Time Purgi	ng Began: 6740	am∕/pr
	,							urged Dry?	Yes	. (Ng		urged Dry:	am/pr
							Sa	ample Date:	30May	18	Time of	Sampling: 0835	am/pr
Depth to Top of Pump: 9,80									1				
Water Level After Sample:			8,	59	ft		Bottle	1L Raw	500ml	L Nitric	500ml Nitri	c (filtered) 250 S	ulfuric
יו	Measureme	nt Method:	Electric	Water Level	Indicator		List:	2/	2		9- 1L Nitric		
					Fiold	Measure	monte						/
Stabil	lization	Temp	Spec.	1	DO	ORP	Turbidity	Water	Pumping	1 .	T		
1	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	mL Removed		Description: Color, Odor, Ect.	
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min	Removed		lightly Turbid, Turbid	
1	0745	13,90	1571	7,38	6,71	64,2	300	8.59	100	500	TWE	,	
2	n815	12,91	1571	7,44	14.78	61.4	6.92	8.58	100	3000	clear		
3	0825	13,05	1572	7.45	4.65	60,9	2,89	8,58	100	1000	dea		
4	0830	12.65	1570	7,45	4.62	606	2,76	8158	100	500	de	-	
5	0835	12,77	1574	7,45	4.66	60,5	2.61	8,58	100	500	clear		
6													
7													
8													
9													

Total Volume Removed: \$5500 mL



**Groundwater Assessment** 

Company:	ME	OU Lewis and Clark	
Event:		Spring 2018	
Sample ID:	120		
Sampling Personal:	Darcen	Wiccina	

									120					
2616 E. Broadway Ave, Bis	smarck, ND							Sampling	Personal:	Da cou	Nº	Cuna	7	
Phone: (701) 258-9	720									our ser				
V41		Т		°F	Mindi	1 ~ 1 1			D!	. 0	1000			
Veather Conditions:	<u></u>	Temp:	<u> 75</u>	· F	Wind:	Light	@	Precip: Sunny Partly Cloudy / Cloudy						
	Well Info	ormation						S	ampling I	Informatio	on <u> </u>			
Well Locked?	Yes	No				Purgi	ng Method:	Bla	dder					
Well Labeled?	Yes	No				Sampli	ng Method:	Bla	ıdder		Cc	ntrol Setting	js .	
Casing Straight?	∕ÿes	No				Dedicat	ted Equip?:	Yes	No		Purge:	5	sec.	
Grout Seal Intact?	Yes	No	(Not	Visible		Duplicate	Sample?:	Yes	No		Recover:	55	sec.	
Repairs Necessary:						Duplicate	Sample ID:				PSI:			
Casing	Diameter:		2"											
Water Level Bef	ore Purge:	)	5.26	ft		F	Purge Date:	29M	nyl8	Time Purg	ing Began:	1834	am/pm	
Peath o	stwell	1	8185			Well P	urged Dry?	Yes	No	Time P	urged Dry:	· <u> </u>	amipm	
, ,						Sa	mple Date:	29 Ma	18	Time of	Sampling:	1914	am/pn	
Depth to Top	o of Pump:	1	6-60	ft				- >	l					
Water Level Afte	er Sample:	j.	5.93	ft		Bottle	1L Raw	500n	nL Nitric	500mL Niti	ic (filtered)	250 St	ılfuric	
Measurement Method: Electric Water Level Indicator					List:				4 - 1L Nitric					
				Eiold	Moscuro	monto								

### Field Measurements

Stabi	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1839	11,64	3821	6,91	0.56	92,3	13,2	15,41	100	500	Clear
. 2	1849	10,55	3753	6.00	0,46	80.4	5.84	15.52	100	1000	C/ea_
3	17859	10.33	3699	6.8a	0,20	79,1	2,79	15,60	100	1000	Chen
4	1904	10,42	3695	6.88	0,32	1815	1.33	15.62	100	500	clean
5	1909	10,31	3718	6,88	0.36	17.9	1,40	15.65	100	500	clear
6	1914	9.89	3761	6.88	0,40	776	1,41	15.66	100	500	(6-
7		1.00		100				13.00			
8											
9											
10											
10	1/1/	<u> </u>	<u></u>		1	L	<del></del>	L	L	1/200	

Stabilized: Yes No

Total Volume Removed: 4000 mL

Su	rface	۱۸/	ato	,
ъu	Hace	: vv	ate	г

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID: Sewag	e lagron
Sampling Personal:	The Nieswaas
- V	

Weather Conditions:	Temp: 60°F	Wind: ¿	Light			Precip:	Sunny / F	artly Cloudy / Cl	oudy
Site Des	cription				Sam	pling Infor			
Source: Pond S	ream Other:		Samplir	g Method:	Grab				
Latitude:	1112 / 11198	7	Sar	nple Date: 21	00 = 1 = 18	<del>2</del>	ime of Sam	npling: 0835	(aŋ)/pn
Longitude:	-104,15514	_	- Oai	TIPIC Date.	MAYID		inte or San	ipinig.	
		]	Bottle		1 Liter Ra	aw		4 41 Nit-i-	
Gauge Reading:			List:	50 <b>₽</b> mL Nit	tric	250 mL Sulfu	ric	4 - 1L Nitric	
				5730 1114 11	· 41		······································		

Field Measurements

Time	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Description: Clarity, Color, Odor, Ect.
0835	20,29	3552	7.89	1.73	40.6	35.9	Slightly turbed

Comments:

**Surface Water** 

2616	E.	Broady	way Ave,	, Bismarck	ND
		7L	(704) 00	0.0700	

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	5P1	
Sampling Personal:	Damen Wiesvaus	

Weather Conditions: Temp: 66	F Wind: Light		Precip: Şui	nny Partly Cloudy / Cloudy
Site Description	()	Sa	mpling Informat	
Source: Pond Stream Other:	Sampl	ing Method: Gr		
Latitude: 47.6808	g Si	ample Date: 7 0 May	18 Time	of Sampling: 1635 am/př
Longitude: - 104.16.266	Bottle	/ 1 1 ite	Raw	
Gauge Reading:	List:	501/ mL Nitric	250 mL Sulfuric	4 - 1L Nitric
	Field Messurements	500 MCN. Trick		

**Field Measurements** 

Time	Temp (°C)	Spec. Cond.	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Description: Clarity, Color, Odor, Ect.
1035	17,73	789	7.87	6.78	61.6	174	Slighth tusid

Comments:

**Surface Water** 

Company:	MDU Lewis and Clark	
Event:	Spring 2018	
Sample ID:	5PZ	
Sampling Personal:	Davien Nierwang	

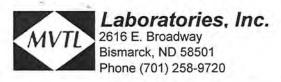
Weather Conditions: Temp: // *F	Wind:	Light			Precip: (	Sunny I	Partly Cloudy / Clo	udy
Site Description		<i>y</i> y		Sa	mpling Infor	mation		
Source: Pond Stream Other:		Samplin	g Method:	Gr	ab			
( - tituda		C	nala Data I C	200		:		
Latitude: 47.68104		Sar	nple Date:	30Ma	1/1/	ime of Sa	ampling: 105%	am/pm
Longitude:		D 111						
		Bottle L		1 Lite	r Raw		4 - 1L Nitric	
Gauge Reading:		List:	50₺ mL		250 mL Sulft	uric	4 - IL NIIIIC	
			500ML	NFILTER	el			

Field Measurements

T:	Temp (°C)	Spec. Cond.	Hq	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Description: Clarity, Color, Odor, Ect.
Time	( 0)		рп	(mg/L)	(IIIV)	(1410)	Clarity, Color, Odor, Ect.
1056	17,77	793	7.78	7.91	61.7	399	Tarbid

Comments:

2616 E. Broadway Ave, Bismarck, ND Phone: (701) 258-9720



## **Chain of Custody Record**

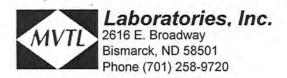
Project Nam	ne:	Event:	Work Order Number:
	MDU Lewis and Clark	Spring 2018	82-1193
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Davien Nieswaag

Sample Information					Bottle Type	Field Pa	rameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter Mitric	Temp (°C)	ha Ha	Analysis Required
W1421	Dup 1	30 May 18	NA	GW	4	NA NA	NA	
W1422	Field Blank (FB)	30 Mly18	NA	w	4	NA NA	NA	
W14Z3	MW103	29May 18	1454	GW	4	12.78 147	5 7.33	
-	MW110	29 May 18	1400	GW	4	obstruction		
W1424	MW119	29 May 18	1258	GW	4	10.63 1118		
W1425	MW111	29 May 18	1729	GW	4	12,71 2997	7,24	Rad 226 & Rad 228
-	MW117	29 may 8	1610	GW	4	Abstruct	al-	
w1426	MW118	30May 18	0835	GW	4	12.77 1574	C C C C C C C C C C C C C C C C C C C	
W1427	MW120	29 May 18	1914	GW	4	9.89 3761	6.88	

Comments: \* 2anay 18 pmf

Relinquished By:	Relinquished By:				
Name:	Date/Time	Location:	Temp (°C)		
1 Dan Nins	31May18 1608	(Log In) Walk In #2	1.0 TM805 TM562/TM805		

/ Name:	Date/Time
IMA XII	31 May 2018
Wu M	1008



# **Chain of Custody Record**

Project Nam	ie:	Event:	Work Order Number:
	MDU Lewis and Clark	Spring 2018	82-1193
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Wieswaag

Sample Information				 Bottle Type				eld Para	ameters	Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	1 liter Nitric			Temp (°C)	Spec. Cond	Ha	Analysis Required
	west Scrubber Pond	31May 18	1105	sw	4			-	-		
w1428	Sewage Lagoon	31May 18	0835	sw	4			20,29	3552	7.89	
W14Z9	SP1	30May 18	1035	sw	4						
W1430	SP2	1/ /	1056	sw	4	00	581	17.73	789	7.87	
		, ,				1354-18	582	17,77	793	7,78	Rad 226 & Rad 228
										1	
							+				

### Comments:

Relinquished By:	Sample Condition:		
Name:	Date/Time	Location:	Temp (°C)
1 Dan Niers	31/Nay18	Walk In #2	1.0 TM805 TM502/TM805
2		=======================================	

Rece	eived by:
//Name:	Date/Time
MIN ON I	31 May 2018
In rec	1608



### MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mytl.com



### CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-1392

Client: Montana Dakota Utilities

Location: MDU Lewis & Clark

Project Identification: Spring 2018 (Radiochem)

MVTL Laboratory Identifications: 18-W1647 through 18-W1648

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
110	18-W1647
117	18-W1648

### I. RECEIPT

- All samples were received at the laboratory on 14 Jun 2018 at 1450.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - o Temperature of samples upon receipt was 4.0°C.
- · No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 19 Jun 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative,

### II. HOLDING TIMES

 All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

### III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.

### IV. ANALYSIS

 All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: DATE: 1971 | D



MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: 110

Event and Year: Spring 2018

1 of 1 Page:

Report Date: 19 Jul 18 Lab Number: 18-W1647 Work Order #: 82-1392 Account #: 002800

Date Sampled: 13 Jun 18 15:12 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	13 Jun 18 15:12	
Temperature - Field	15.6	Degrees C	NA	SM 2550B	13 Jun 18 15:12	
Conductivity - Field	1031	umhos/cm	1	EPA 120.1	13 Jun 18 15:12	
Radium 226	See Attached Report				11 Jul 18	OL
Radium 228	See Attached Report				11 Jul 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\theta$  = Due to sample matrix # = Due to co ! = Due to sample quantity # = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: 117

Event and Year: Spring 2018

Page: 1 of 1

Report Date: 19 Jul 18 Lab Number: 18-W1648 Work Order #: 82-1392 Account #: 002800

Date Sampled: 14 Jun 18 6:17 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	14 Jun 18		
Temperature - Field	9.85	Degrees C	NA	SM 2550B	14 Jun 18		
Conductivity - Field	8475	umhos/cm	1	EPA 120.1	14 Jun 18	6:17	
Radium 226	See Attached Report See Attached Report				11 Jul 18		OL
Radium 228					11 Jul 18		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K Canto

10 19 JUL 18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

0 = Due to sample matrix
! = Due to sample quantity

# - Due to concentration of other analytes + - Due to internal standard response



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 7/13/2018

CLIENT: Project:

MVTL Laboratories, Inc.

201882-1392

Lab Order:

S1806333

**CASE NARRATIVE** 

Report ID: S1806333001

Samples 18-W16747 110 and 18-W16748 117 were received on June 19, 2018.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition 40 CFR Parts 136 and 141 40 CFR Part 50, Appendices B, J, L, and O Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012 ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by: All

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



1673 Terra Avenue, Sheridan, Wyoming 82801

ph: (307) 672-8945

Report ID

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1392

Lab ID: ClientSample ID: 18-W16747 110

S1806333-001

COC:

201882-1382

PWS ID:

WorkOrder:

S1806333

S1806333001

CollectionDate: 6/13/2018 3:12:00 PM

Date Reported 7/13/2018

DateReceived: 6/19/2018 11:20:00 AM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	07/11/2018 1502	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	07/11/2018 1502	MB
Radium 228	-0.2	pCi/L		1	Ga-Tech	07/11/2018 2007	MB
Radium 228 Precision (±)	1.9	pCi/L			Ga-Tech	07/11/2018 2007	MB

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Н Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- Not Detected at the Reporting Limit ND
- Spike Recovery outside accepted recovery limits
- Χ Matrix Effect

#### RL - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 2



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-1392

Lab ID:

S1806333-002 ClientSample ID: 18-W16748 117

COC:

201882-1382

PWS ID:

Radium 228

Radium 228 Precision (±)

WorkOrder:

-0.4

1.3

Date Reported

Report ID

CollectionDate: 6/14/2018 6:17:00 AM

Ga-Tech

Ga-Tech

DateReceived: 6/19/2018 11:20:00 AM

07/11/2018 2310

07/11/2018 2310

MB

MB

FieldSampler:

Matrix:

1

Water

7/13/2018

S1806333

S1806333001

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.9	pCi/L		0.2	SM 7500 Ra-B	07/11/2018 1502	MB
Radium 226 Precision (±)	0.2	pCi/L			SM 7500 Ra-B	07/11/2018 1502	MB

pCi/L

pCi/L

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range Ε
- Holding times for preparation or analysis exceeded Н
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Х Matrix Effect

**RL** - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory
- Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by: All

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 2



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

#### **ANALYTICAL QC SUMMARY REPORT**

CLIENT:

MVTL Laboratories, Inc.

S1806333

Work Order: Project:

201882-1392

Date: 7/13/2018

Report ID: S1806333001

Radium 228 by Ga/Tech	Sample Type MBLK		Units:	pCi/L			
MB-514 (07/09/18 10:11)	RunNo: 159126	PrepD	) ate: 06/28	8/18 0:00	Bate		
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1					
Radium 228 by Ga/Tech	Sample Type LCS		Units:	pCi/L			
LCS-514 (07/09/18 13:14)	RunNo: 159126	PrepDate: 06/28/18 0:0		8/18 0:00	Bate	chID 14759	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	37	1	39		95.7	65.9 - 132	
Radium 228 by Ga/Tech	Sample Type MS		Units:	pCi/L			
MS-514 (07/09/18 19:20)	RunNo: 159126	PrepD	ate: 06/28	8/18 0:00	Bate	chID 14759	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	34	1	39	ND	87.8	50 - 139	
Radium 228 by Ga/Tech	Sample Type MSD		Units:	pCi/L			
MSD-514 (07/09/18 22:23)	RunNo: 159126	PrepD	ate: 06/28	8/18 0:00	Bate	chiD 14759	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Total Radium 228	38	1	34	10.0	97.1	20	
Radium 226 in Water -	Sample Type MBLK		Units:	pCi/L			
MB-1874 (07/11/18 12:45)	RunNo: 159097	PrepD	ate: 06/2	5/18 0:00	Bato	chID 14771	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	ND	0.2					
Radium 226 in Water -	Sample Type LCS		Units:	pCi/L			
LCS-1874 (07/11/18 12:45)	RunNo: 159097	PrepD	ate: 06/25			chiD 14771	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	7.0	0.2	6.95		100	67.1 - 122	
Radium 226 in Water -	Sample Type MS		Units:	pCi/L			
MS-1874 (07/11/18 12:45)	RunNo: 159097	PrepD	ate: 06/25	5/18 0:00	Bato	hID 14771	
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Radium 226	7.8	0.2	6.95	ND	111	65 - 131	
Radium 226 in Water -	Sample Type MSD		Units:	pCi/L			
MSD-1874 (07/11/18 12:45)	RunNo: 159097	PrepD	ate: 06/25	5/18 0:00	Bato	hID 14771	
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual
Radium 226	7.4	0.2	7.8	4.35	107	20	

Qualifiers:

- В Analyte detected in the associated Method Blank
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- RPD outside accepted recovery limits
- Matrix Effect

- Ε Value above quantitation range
- Н Holding times for preparation or analysis exceeded
- L Analyzed by another laboratory
- 0 Outside the Range of Dilutions
- Spike Recovery outside accepted recovery limits



### LABORATORIES, Inc. 2616 E Broadway Ave Bismarck, ND 58501

# **Chain of Custody Record**

Page 1 of 1 .

Toll Free: (8	Phone: (701) 2	258-9720 Fax: (701) 2										201882-139	2	
Company Name		1 ux. (101) 2		······································	Account #:				<del></del>			Phone #:		
											$\neg$		01-258-9720	
		VTL			Contact:							Fax #:		
		Broadway				Claud	ette	}				For faxed re	eport check box	
		<u>, ND 58501</u>			Name of Sa	mpler:						E-mail:	ccarroll@mvt	tl.com
Billing Address	(indicate if different	from above	e):	***									eport check box	
					Quote Num	ıber						Date Submitted:		
		ox 249											15-Jun-18	
	New Ulm	<u>, MN 56073</u>			Project Nar	ne/Numbe	r:				_	Purchase Order		
		Sample In	formation				T		- 117				BL6060	
		Sample II	normation	······································	I	I		B	ottle	ıyp	e		Analysis	······································
IML Lab Number	MVTL Lab Number	Client	Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass Jar	Other	An	nalysis Requir	ed
518063337	ص 18-W1647		110	GW	13-Jun-18	1512		4				F	Ra226 & Ra22	В
002	18-W1648		117	GW	14-Jun-18	0617		4				F	Ra226 & Ra22	3
													· · · · · · · · · · · · · · · · · · ·	
								<u> </u>			$\dashv$		arwe	
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		·						ļ						v
				<del></del>										
Comments: All	results must be repo	orted as a n	umerical value.				1	<u> </u>						
Trans	ferred by:	Date:	Time:	Sample	Condition:	R	ecei	ived	by:			Date:		Temp:
Nathan Buchm	ann	15-Jun-18	1700			Kadt	Λ. I	7	MP			6.19.18	11:20	18.0
2.						- 800	× ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~						-	



# **Field Datasheet**

#### **Groundwater Assessment**

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	110 ,
Sampling Personal:	Jeney Phy

	•							Jamping r	ersonar.	- الاستانات	~~~ P /~	سر	
Phone: (701) 258-9	9720						-				ι ,		
Weather Conditions:		Temp:	70 °F	Wind:	S	@	5-1	ن ن	Precip	Sunn	y / Rartiy C	loudy / Clo	udy
	Well Info	rmation						Sa	ampling I	nformatio	n		
Well Locked?	Yes	No			Purg	ing M	ethod:	Blac	dder				
Well Labeled?		No			Sampl	ing M	ethod:	Blac	dder	l . [	· Co	ntrol Setting	s
Casing Straight?	(es)	No			Dedica	ited E	quip?:	Yes	(NO)		Purge:	5	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	e San	ple?:	Yes	NO		Recover:	55	sec.
Repairs Necessary:					Duplicate	Sam	ole ID:				PSI:	15	
Casing	Diameter:		2"										
Water Level Bef			, <i>80</i> ft		. 1	Purge	Date:	13 Ju	_16	Time Purgi	ng Began:	1212	am/🇖
Better	n:		0,92		Well F	urge	d Dry?	Yes	(No)		urged Dry:	*	am/pm
					Sa	ample	Date:	13 Ju	/C	Time of	Sampling:	1517	am/pm
Depth to Top	o of Pump:	,	<del></del> ft			4							
Water Level After	er Sample:	9.01	ft		Bottle	1L	Raw	500ml	₋ Nitric	500mL Nitr	ic (filtered)	250 Su	lfuric
Measuremer	nt Method:	Electric W	later Level Indicator		List:				*	4 - 1L Nitric			

#### **Field Measurements**

Stabili	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	ecutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1217	16.41	1040	7.38	3,32	130.1	696.0	8,89	100,0	500,0	Turkid ton
2	1247	17,41	1030	7,06	2,28	48.2	265,0	8,93	100,0	3090,0	Slightly Tucked
3	1317	14.88	1029	7.07	2.09	37,&	115,0	8.93	100.0	30000	Slightly Turked
4	1347	14.84	1028	7.15	2,52	31,2	46,6	8.93	100,0	3000,0	Clear
5	1417	15.38	1029	7.15	2,23	24.7	25,1	894	100,0	3000.0	Clar
6	1487	15,56	1032	7,12	218	23.3	19,5	8,95	100.0	2000,0	Cla
7	1457	15,63	1030	7.31	2.91	69.3	5.01	8.97	/2° . °	2000,0	Chi
8	1562	15,93	1026	7.30	2.83	74,8	4,91	8,97	100,0	Soulo	Cler
9	1507	15,72	1027	7,29	2.94	68.6	4.76	2,96	100,0	500.O	Clip
10	1512	15.61	1031	(1,33	2.89	70,2	4.78	8.96	100.0	500.0	ch

Stabilized:

Total Volume Removed: 👸 🚾 ເວັຼ mL

Comments:

Slight destruction able to get longer blodder pour past



# **Field Datasheet**

#### **Groundwater Assessment**

Company:	MDU Lewis and Clark
Event:	, Spring 2018
Sample ID:	117,
Sampling Personal:	Jeng Mayer

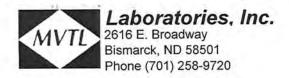
Phone: (701) 258-9	3720						-	······································	·. · · · · · · · · · · · · · · · · · ·				
Weather Conditions:		Temp:	( <sub>Ø</sub> 0 °F		Wind:	2	@ 3-10	Ż	Precip	: Sunr	ıy / Partiy C	Houdy / Clo	udy
-	Well Infe	ormation						Sa	mpling	Informatio	on	•	
Well Locked?	Yes	(No)				Purgi	ng Method:	Blac	lder				
Well Labeled?	Yes	No				Sampli	ng Method:	Blac	lder		Со	ntrol Setting	gs
Casing Straight?	(Yes,	No				Dedica	ted Equip?:	Yes	(No)		Purge:	5	sec.
Grout Seal Intact?	Yes	No	Not Visible			Duplicate	Sample?:	Yes	(No)		Recover:	52	sec.
Repairs Necessary:						Duplicate	Sample ID:	<			PSI:	10	
Casing	Diameter:		2"										
Water Level Bef	ore Purge:	8	<i>ら、</i> とら	ft		F	ourge Date:	13 June	18	Time Purg	ing Began:	1614	am/øĝĵ
		}	11.54			Well P	urged Dry?	Yes	No	Time F	urged Dry:	1649	am(pm
						Sa	mple Date:	14 In 19.		Time of	f Sampling:	0617	@m/pm
Depth to Top	o of Pump:	-il	T 9,25	ft									
Water Level After	er Sample:	Bel	on Pur	ft		Bottle	1L Raw	500ml	₋ Nitric	500mL Nit	ric (filtered)	250 St	ulfuric
Measuremer	nt Method:	Electric \	Water Level Indica	itor		List:				4 - 1L Nitric	,		
			F	ield	Measure	ments							

Stabi	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	.±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	16 19	15,62	8794	7.13	9,64	1684	617.0	5,93	100,0	500,0	tubid Ten
2	1629	15.24	9.366	7.14	9.96	187,4	22.8	720	100,0	1000,0	Clean
3	1639	12,87	8555	7,12	9,42	198,0	17.9	8,06	100,0	(000,0	Cles
4	1649	12.43	®S40	7.17	10,49	203.4	18,5	Belowpun	100.0	1000.0	cla
5									·	:	
6	0612	Purged	well for	5 min	to cla	· line		6.58	j00.0	500.0	
7	5617	9.65	8475	7.24	10,42	226.2	4.41		)		Clean
8											
9							,				
10										recharge	

(No) Stabilized:

Total Volume Removed: 4000,0 mL

Comments:



# **Chain of Custody Record**

Project Nam	ie:	Event:	Work Order Number:	
	MDU Lewis and Clark	Spring 2018	82-1392	
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):	

Analysis  Analysis Required	Field Parameters			ype	Bottle 1	- 1	-		on ,	ole Informatio	Sam	
	Hd	Spec. Cond.	Temp (°C)			1 liter Nitric		Sample Type	Time	Date	Sample ID	Lab Number
	7.33	1031	15,61		111	4		GW	1512	13 June 18	110	W1447
	7.24	8475			11 =:	4		GW	0617	14 Jin 18	117	W1648
Rad 226 & Rad 22												

#### Comments:

Relinquished By:		Sam	ple Condition:
Name:	Date/Time	Location:	Temp (°C)
1000	14/11/8	Log Ip Walk In #2	4.0 7M562 / TM805
2			

Name:	Date/Time
Tara All	147m 2018
	1450



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



#### CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201882-1391

Client: Montana Dakota Utilities

Location: MDU Lewis & Clark

Project Identification: Spring 2018

MVTL Laboratory Identifications: 18-W1645 through 18-W1646

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
110	18-W1645
117	18-W1646

#### I. RECEIPT

- All samples were received at the laboratory on 14 Jun 2018 at 1450.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 4.0°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

 With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

#### III. METHODS

Approved methodology was followed for all sample analyses.

#### IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - o For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
  - For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - Recovery for one beryllium total matrix spike was outside of the acceptable limits. Recovery
    of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix
    spike/matrix spike duplicate was acceptable. No further action was taken.
  - The recoveries for one selenium dissolved matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.



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#### CASE NARRATIVE

-MVTL Lab Reference No/SDG:

201882-1391

Client:

**Montana Dakota Utilities** 

Location:

MDU Lewis & Clark

Project Identification:

Spring 2018

**MVTL Laboratory Identifications:** 

18-W1645 through 18-W1646

Page 2 of 2

The recoveries for one mercury dissolved matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

DATE: 13 JUL 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

# **MVTL**

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Page: 1 of 3

**Quality Control Report** 

Lab IDs: 18-W1645 to 18-V	V 1646	Pr	oject: MI	JU Lewis	& Clark		work Or		882-1391				To a second of T		r	I e .	
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	< 0.001 < 0.001	0.1056 0.1051	106 105	75-125 75-125	0.1056 0.1051	0.1006 0.0992	101 99	4.8 5.8	20 20	-	-	< 0.001
Antimony - Total mg/l	0.1000	109	80-120	0.100	18-W1646	< 0.001	0.1062	106	75-125	0.1062	0.1059	106	0.3	20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1106 0.1072	111 107	75-125 75-125	0.1106 0.1072	0.1022 0.1044	102 104	7.9 2.6	20 20	-	-	< 0.002
Arsenic - Total mg/l	0.1000	105	80-120	0.100	18-W1646	< 0.002	0.1096	110	75-125	0.1096	0.1069	107	2.5	20	-	-	< 0.002
Barium - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	0.0308 0.0137	0.1298 0.1129	99 99	75-125 75-125	0.1129	0.1098	96	2.8	20	-	-	< 0.002
Barium - Total mg/l	0.1000	106	80-120	0.100	18-W1646	0.0201	0.1272	107	75-125	0.1272	0.1268	107	0.3	20	_	-	< 0.002
Beryllium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005		116 118	75-125 75-125	0.1155 0.1178	0.1162 0.1118	116 112	0.6 5.2	20 20	-	-	< 0.000
Beryllium - Total mg/l	0.1000	108	80-120	0.100	18-W1646	< 0.0005	0.1278	128	75-125	0.1278	0.1231	123	3.7	20	-	-	< 0.000
Boron - Dissolved mg/l	0.40 0.40	110 108	80-120 80-120	2.00	18-W1774	0.86	3.04	109	75-125	3.04	2.76	95	9.7	20	-	- - -	< 0.1 < 0.1 < 0.1
Boron - Total mg/l	0.40	110	80-120	0.400 0.400	18-D2232 18-W1732	3.34 0.57	3.75 0.98	102 102	75-125 75-125	3.75 0.98	3.82 0.96	120 98	1.8 2.1	20 20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005		108 105	75-125 75-125	0.1083 0.1054	0.1078 0.1021	108 102	0.5 3.2	20 20	-		< 0.000
Cadmium - Total mg/l	0.1000	107	80-120	0.100	18-W1646	< 0.0005	0.1039	104	75-125	0.1039	0.1052	105	1.2	20	-	-	< 0.000
Calcium - Dissolved mg/l	20.0	108	80-120	500	18W1646q	409	895	97	75-125	895	910	100	1.7	20	_	-	< 1 < 1
Calcium - Total mg/l	20.0	106	80-120	100	18W1645q	87.0	174	87	75-125	174	174	87	0.0	20	-	-	< 1 < 1
Chloride mg/l	30.0 30.0	99 96	80-120 80-120	30.0	18-D2093	88.6	118	98	80-120	118	119	101	0.8	20	-	-	< 1 < 1

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Quality Control Report

Lab IDs: 18-W1645 to 18-W	1040	rı	oject: MI	JU Lewis	& Clark		work Or	·	882-139				Lancon tal			T	
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1034 0.1108	103 111	75-125 75-125	0.1034 0.1108	0.0964 0.1056	96 106	7.0 4.8	20 20	-	-	< 0.002
Chromium - Total mg/l	0.1000	104	80-120	0.100	18-W1646	0.0074	0.1238	116	75-125	0.1238	0.1204	113	2.8	20		-	< 0.002
Cobalt - Dissolved mg/l	0.0160	106	80-120	0.100 0.100	18W1626q 18-W1646	< 0.002 < 0.002	0.1048 0.1066	105 107	75-125 75-125	0.1048 0.1066	0.1016 0.1006	102 101	3.1 5.8	20 20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	107	80-120	0.100	18-W1646	< 0.005	0.1138	114	75-125	0.1138	0.1134	113	0.4	20	_	-	< 0.002
Fluoride mg/l	0.50 0.50	108 106	90-110 90-110	0.500 0.500	18-W1645 18-W1663	0.51 0.24	1.00 0.80	98 112	80-120 80-120	1.00 0.80	0.99 0.71	96 94	1.0 11.9	20 20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	101	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005		92 91	75-125 75-125	0.0919 0.0912	0.1004 0.0874	100 87	8.8 4.3	20 20	-	-	< 0.000
Lead - Total mg/l	0.1000	105	80-120	0.100	18-W1646	< 0.0005	0.0951	95	75-125	0.0951	0.0949	95	0.2	20	-	-	< 0.000
Lithium - Dissolved mg/l	0.40	108	80-120	2.00	18-W1646	< 0.5	1.98	99	75-125	1.98	1.95	98	1.5	20	-		< 0.1 < 0.1 < 0.1
Lithium - Total mg/l	0.40 0.40 0.40	105 105 108	80-120 80-120 80-120	4.00 0.400	18-D2080 18-W1732	< 1 < 0.1	3.72 0.46	93 115	75-125 75-125	3.72 0.46	3.59 0.46	90 115	3.6 0.0	20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Magnesium - Dissolved mg/l	20.0	106	80-120	500	18W1646q	1160	1620	92	75-125	1620	1640	96	1.2	20	-	-	< 1 < 1
Magnesium - Total mg/l	20.0	104	80-120	100	18W1645q	54.0	143	89	75-125	143	143	89	0.0	20		-	< 1 < 1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	18-W1696	< 0.0002	0.0012	60	70-130	0.0012	0.0012	60	0.0	20	-	_	< 0.000
Mercury - Total mg/l	0.0020	100	85-115	0.002	18-W1646	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	< 0.000
Molybdenum - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	18W1626q 18-W1646	0.0034 0.0033	0.1080 0.1135	105 110	75-125 75-125	0.1080 0.1135	0.0986 0.1077	95 104	9.1 5.2	20 20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000	110	80-120	0.100	18-W1646	0.0056	0.1225	117	75-125	0.1225	0.1227	117	0.2	20	_	-	< 0.002

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**Quality Control Report** 

**Lab IDs:** 18-W1645 to 18-W1646

Project: MDU Lewis & Clark

Work Order: 201882-1391

Lab IDS: 18-W1645 to 18-W	1040	Pr	roject: ML	JU Lewis	s & Clark		Nork Or	<b>rder:</b> 201	.882-139	1							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec ) (%)	Known % Rec Limits	Method Blank
Nitrate-Nitrite as N mg/l	0.50 0.50	110 104	90-110 90-110		18-W1634	< 0.1	0.91	91	90-110	0.91	0.93	93	2.2	20		-	< 0.1 < 0.1
pH units	-	-	-	-	-	-	-	-		5.9 7.5	5.9 7.6	-	0.0	20 20	-	-	-
Potassium - Dissolved mg/l	10.0	90	80-120	100	18W1646q	23.5	120	96	75-125	120	122	98	1.7	20		-	< 1 < 1
Potassium - Total mg/l	10.0	92	80-120	20.0	18W1645q	6.6	24.0	87	75-125	24.0	24.0	87	0.0	20	-	-	<1 <1
Selenium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W1626q 18-W1646	< 0.005 0.0393	0.1230 0.1708	123 132	75-125 75-125		0.1181 0.1664	118 127	4.1 2.6	20 20	-	-	< 0.005
Selenium - Total mg/l	0.1000	102	80-120	0.100	18-W1646	0.0403	0.1571	117	75-125	0.1571	0.1578	118	0.4	20	-	-	< 0.005
Sodium - Dissolved mg/l	20.0	104	80-120	500	18W1646q	580	1060	96	75-125	1060	1080	100	1.9	20		-	< 1 < 1
Sodium - Total mg/l	20.0	100	80-120	100	18W1645q	77.7	166	88	75-125	166	164	86	1.2	20	-	-	< 1 < 1
Sulfate mg/l	100	101	80-120	200	18-W1652	168	330	81	80-120	330	332	82	0.6	20	-	_	< 5
Thallium - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W1626q 18-W1646	< 0.0005 < 0.0005		92 92	75-125 75-125		0.0978 0.0881	98 88	5.9 4.4	20 20	-	-	< 0.0005
Thallium - Total mg/l	0.1000	104	80-120	0.100	18-W1646	< 0.0005	0.0965	96	75-125	0.0965	0.0962	96	0.3	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	97	90-110	410 410	18-W1669 18-W1670	425 499	798 876	91 92	80-120 80-120		803 876	92 92	0.6	20 20	93	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	_	-	9870	10000	-	1.3	20	_	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	13 26	14 26	-	7.4 0.0	20 20	-	-	< 2

Approved by: C. CMVO 13TVL18



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: 110

Event and Year: Spring 2018

Page: 1 of 2

Report Date: 5 Jul 18 Lab Number: 18-W1645 Work Order #: 82-1391 Account #: 002800

Date Sampled: 13 Jun 18 15:12 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	14 Jun 18	SVS
pH	* 7.8	units	N/A	SM4500 H+ B	15 Jun 18 18:00	SVS
Total Suspended Solids	7	mg/l	2	13765-85	15 Jun 18 15:43	svs
pH - Field	7.33	units	NA	SM 4500 H+ B	13 Jun 18 15:12	
Temperature - Field	15.6	Degrees C	NA	SM 2550B	13 Jun 18 15:12	
Total Alkalinity	328	mg/l CaCO3	20	SM2320-B	19 Jun 18 17:00	SVS
Conductivity - Field	1031	umhos/cm	1	EPA 120.1	13 Jun 18 15:12	
Fluoride	0.51	mg/l	0.10	SM4500-F-C	18 Jun 18 17:00	SVS
Sulfate	222	mg/l	5.00	ASTM D516-07	21 Jun 18 11:58	EMS
Chloride	20.4	mg/1	1.0	SM4500-C1-E	20 Jun 18 14:15	EMS
Nitrate-Nitrite as N	5.16	mg/l	0.10	EPA 353.2	22 Jun 18 12:06	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Total Dissolved Solids	667	mg/1	10	11750-85	15 Jun 18 10:01	SVS
Calcium - Total	87.0	mg/1	1.0	6010D	25 Jun 18 13:39	BT
Magnesium - Total	54.0	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Sodium - Total	77.7	mg/1	1.0	6010D	25 Jun 18 13:39	BT
Potassium - Total	6.6	mg/1	1.0	6010D	25 Jun 18 13:39	BT
Lithium - Total	< 0.1	mg/1	0.10	6010D	27 Jun 18 13:22	BT
Boron - Total	0.26	mg/1	0.10	6010D	3 Jul 18 13:00	BT
Calcium - Dissolved	82.4	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Magnesium - Dissolved	51.4	mg/1	1.0	6010D	19 Jun 18 16:00	BT
Sodium - Dissolved	75.1	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Potassium - Dissolved	5.3	mg/1	1.0	6010D	19 Jun 18 16:00	BT
Lithium - Dissolved	< 0.1	mg/1	0.10	6010D	27 Jun 18 13:22	BT
Boron - Dissolved	0.20	mq/1	0.10	6010D	3 Jul 18 12:00	BT
Antimony - Total	< 0.001	mg/1	0.0010	6020B	18 Jun 18 18:37	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Barium - Total	0.0345	mg/1	0.0020	6020B	18 Jun 18 18:37	CC
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	18 Jun 18 18:37	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Cobalt - Total	< 0.005 ^	mg/1	0.0020	6020B	18 Jun 18 18:37	CC
Lead - Total	0.0007	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Molybdenum - Total	0.0040	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	18 Jun 18 18:37	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

a = Due to sample matrix # = Due to complete the property # = Due to interpret the property # = Due to interpret # = Due to interpre

CERTIFICATION: ND # ND-00016

# = Due to concentration of other analytes + = Due to internal standard response



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Report Date: 5 Jul 18 Lab Number: 18-W1645 Work Order #: 82-1391 Account #: 002800

Date Sampled: 13 Jun 18 15:12 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: 110

Event and Year: Spring 2018

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst	
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	19 Jun 18 17:34	CC	
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC	
Barium - Dissolved	0.0265	mg/l	0.0020	6020B	19 Jun 18 17:34	CC	
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC	
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC	
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	19 Jun 18 17:34	CC	
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020B	19 Jun 18 17:34	CC	
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC	
Molybdenum - Dissolved	0.0031	mg/1	0.0020	6020B	19 Jun 18 17:34	CC	
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	19 Jun 18 17:34	CC	
Thallium - Dissolved	< 0.0005	mg/1	0.0005	6020B	19 Jun 18 17:34	CC	

<sup>\*</sup> Holding time exceeded

Approved by: Claudette K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to con
! = Due to sample quantity + = Due to int

# = Due to concentration of other analytes + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr

Project Name: MDU Lewis & Clark

Billings MT 59102

Sample Description: 117

Event and Year: Spring 2018

Page: 1 of 2

Report Date: 5 Jul 18 Lab Number: 18-W1646 Work Order #: 82-1391 Account #: 002800

Date Sampled: 14 Jun 18 6:17 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

	As Receiv	ed	Method	Method	Date	
	Result		RL	Reference	Analyzed	Analyst
Metal Digestion				EPA 200.2	14 Jun 18	svs
pH	* 7.6	units	N/A	SM4500 H+ B	15 Jun 18 18:00	svs
Total Suspended Solids	26	mg/l	2	13765-85	15 Jun 18 15:43	SVS
pH - Field	7.24	units	NA	SM 4500 H+ B	14 Jun 18 6:17	
Temperature - Field	9.85	Degrees C	NA	SM 2550B	14 Jun 18 6:17	
Total Alkalinity	396	mg/l CaCO3	20	SM2320-B	19 Jun 18 17:00	SVS
Conductivity - Field	8475	umhos/cm	1	EPA 120.1	14 Jun 18 6:17	
Fluoride	0.29	mg/l	0.10	SM4500-F-C	18 Jun 18 17:00	SVS
Sulfate	7560	mg/1	5.00	ASTM D516-07	21 Jun 18 11:58	EMS
Chloride	47.9	mg/1	1.0	SM4500-C1-E	20 Jun 18 14:15	EMS
Nitrate-Nitrite as N	24.0	mg/l	0.10	EPA 353.2	22 Jun 18 12:06	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	21 Jun 18 12:23	EV
Total Dissolved Solids	9870	mg/l	10	I1750-85	15 Jun 18 10:01	SVS
Calcium - Total	413	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Magnesium - Total	1220	mg/1	1.0	6010D	25 Jun 18 13:39	BT
Sodium - Total	600	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Potassium - Total	29.2	mg/l	1.0	6010D	25 Jun 18 13:39	BT
Lithium - Total	< 0.5 @	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Total	12.4	mg/l	0.10	6010D	3 Jul 18 13:00	BT
Calcium - Dissolved	409	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Magnesium - Dissolved	1160	mg/1	1.0	6010D	19 Jun 18 16:00	BT
Sodium - Dissolved	580	mg/1	1.0	6010D	19 Jun 18 16:00	BT
Potassium - Dissolved	23.5	mg/l	1.0	6010D	19 Jun 18 16:00	BT
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010D	27 Jun 18 13:22	BT
Boron - Dissolved	11.1	mg/l	0.10	6010D	3 Jul 18 12:00	BT
Antimony - Total	< 0.001	mg/l	0.0010	6020B	18 Jun 18 18:37	CC
Arsenic - Total	< 0.002	mg/1	0.0020	6020B	18 Jun 18 18:37	CC
Barium - Total	0.0201	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	18 Jun 18 18:37	CC
Chromium - Total	0.0074	mg/1	0.0020	6020B	18 Jun 18 18:37	CC
Cobalt - Total	< 0.005 *	mg/l	0.0020	6020B	18 Jun 18 18:37	CC
Lead - Total	< 0.0005	mg/1	0.0005	6020B	18 Jun 18 18:37	CC
Molybdenum - Total	0.0056	mg/1	0.0020	6020B	18 Jun 18 18:37	CC
Selenium - Total	0.0403	mg/l	0.0050	6020B	18 Jun 18 18:37	CC
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	18 Jun 18 18:37	CC

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: 117

Event and Year: Spring 2018

2 of 2 Page:

Report Date: 5 Jul 18 Lab Number: 18-W1646 Work Order #: 82-1391 Account #: 002800

Date Sampled: 14 Jun 18 6:17 Date Received: 14 Jun 18 14:50 Sampled By: MVTL Field Services

Temp at Receipt: 4.0C

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst	
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	19 Jun 18 17:34	CC	
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	19 Jun 18 17:34	CC	
Barium - Dissolved	0.0137	mg/l	0.0020	6020B	19 Jun 18 17:34	CC	
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020B	19 Jun 18 17:34	CC	
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	19 Jun 18 17:34	CC	
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	19 Jun 18 17:34	CC	
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020B	19 Jun 18 17:34	CC	
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	19 Jun 18 17:34	CC	
Molybdenum - Dissolved	0.0033	mg/l	0.0020	6020B	19 Jun 18 17:34	CC	
Selenium - Dissolved	0.0393	mg/l	0.0050	6020B	19 Jun 18 17:34	CC	
Thallium - Dissolved	< 0.0005	mg/1	0.0005	6020B	19 Jun 18 17:34	CC	

<sup>\*</sup> Holding time exceeded

Approved by:

Claudette K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### Due to co

! # Due to sample quantity # = Due to in

CERTIFICATION: ND # ND-00016

# = Due to concentration of other analytes
+ = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



# **Field Datasheet**

**Groundwater Assessment** 

Company:	MDU Lewis and Clark
Event:	Spring 2018
Sample ID:	110
Sampling Personal:	Jones May

Phone: (701) 258-9								F 1					
Weather Conditions:		Temp:	70 °F		Wind:	5	@ 5-	10	Precip	: Suni	ıy / Rartiy C	loudy / Clo	udy
	Well Info	rmation						S	ampling l	nformatio	on		
Well Locked?	Yes	No				Purg	ing Method:	Bla	dder				
Well Labeled?	Yes	No				Samp	ling Method:	Bla	dder		Co	ntrol Setting	js
Casing Straight?	(es)	No				Dedica	ated Equip?:	Yes	(No)		Purge:	5	sec.
Grout Seal Intact?	∕Y <b>r</b> es	No	Not Visible	•		Duplicat	e Sample?:	Yes	MO		Recover:	22	sec.
Repairs Necessary:						Duplicate	Sample ID:				PSI:	15	
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	¥	3,80	ft			Purge Date:	13 Ja	ر الل	Time Purg	ing Began:	1212	am/ <b>ợ</b> m
Betten	n:	l(	6.92			Well I	Purged Dry?	Yes	(No)		urged Dry:	4	am/pm
						S	ample Date:	13 Jun	/6	Time of	Sampling:	1512	am/pm
Depth to Top	of Pump:	-		ft									
Water Level After	Water Level After Sample: 9,01 ft		ft		Bottle	1L Raw	500m	L Nitric	500mL Nit	ric (filtered)	250 Su	ılfuric	
Measurement Method: Electric Water Level Indicator				ator		List:	List: 4 - 1L Nitric						
				الماط	Moacuro	monte							

#### Field Measurements

Stabil	Stabilization Temp Spec		Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1217	16.41	1040	7.38	3,32	130.1	696.0	<i>જ</i> ્ષ્ટ્	100.0	500.0	Turkid ton
2	1247	17,41	1030	7,06	2.28	48.2	265,0	8,93	100,0	3000,0	Sightly Tuited
3	1317	14.88	1029	7.07	2.09	37,E	115.0	893	100.0	30000	Slighthy Tundred
4	1347	14.84	1028	7.15	2,52	31,2	46.6	8.93	100,0	3000,0	Clear
5	1417	15.38	1029	7,15	2,23	24.7	25,1	894	100,0	3000,0	Clean
6	1487	15,58	1032	7,12	218	23.3	19.5	2,95	100.0	20000	Clin
7	1457	15,83	1030	7.31	2.41	64.3	5.01	5.97	/୬୦ <sub>.</sub> ୦	2000,0	Chi
8	1502	15.93	1026	7.30	2.83	74,8	4,91	8,97	1000	Source	Cler
9	1507	15.72	1027	7.29	2.94	68.0	4.76	2.98	100,0	500.0	Clean
10	1512	15.61	1031	J.33	2.89	70,2	4.70	6.96	100.0	500,0	ch

Stabilized:

Total Volume Removed: 👸 👓 ,O mL

Slight distruction she to get longer blodder pump past



# **Field Datasheet**

**Groundwater Assessment** 

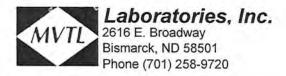
Company:	MDU Lewis and Clark
Event:	, Spring 2018
Sample ID:	117.
Sampling Personal:	Jan Mary

2010 2. 2. 0000000, 1110, 210	ornaron, rib								Sampling P	ersonai:			m Plus	********
Phone: (701) 258-9	720							_			***	-7.3	( ' /	
Weather Conditions:		Temp:	( <sub>0</sub> 0 °F		Wind:	2	@	5-10	<i>&gt;</i>	Precip	: Suni	ıy / Partiy C	Houdy / Clo	oudy
	Well Info	ormation							Sa	mpling	Informatio	on		
Well Locked?	Yes	(No)				Purg	ging M	lethod:	Blad	<del></del>				
Well Labeled?	Yes)	No				Samp	ling M	lethod:	Blad	der		Co	ntrol Setting	gs
Casing Straight?	(Yes)	No				Dedica	ated E	quip?:	Yes	(No)		Purge:	5	sec
Grout Seal Intact?	Yes	No	Not Visibl	e		Duplicat	e San	nple?:	Yes	(No)		Recover:	5 <u>5</u>	sec.
Repairs Necessary:						Duplicate	Sam	ple ID:				PSI:	10	
Casing	Diameter:		2"											
Water Level Befo	ore Purge:	6	5,55	ft			Purge	Date:	13 June	1 B	Time Purg	ing Began:	1614	am/pm
			11,54			Well	Purge	d Dry?	Yes	No	Time F	urged Dry:	1649	am(pm
						S	ample	Date:	14 Lu 18		Time of	Sampling:	0617	ami/pm
Depth to Top	of Pump:	-11	<del> 9,25</del>	ft										
Water Level Afte	er Sample:	Bel	on Pur	ft		Bottle	1L	Raw	500mL	Nitric	500mL Niti	ric (filtered)	250 St	ulfuric
Measuremen	t Method:	Electric \	Water Level Indic	ator		List:					4 - 1L Nitric			
				Field	Measure	ments							-	

Stabili	1 1 1		Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	ecutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1619	15,62	8794	7.13	9.64	1684	617.0	5,93	100,0	500,0	tubid Ten
2	1629	15.24	9.366	7.14	9.96	187.4	22.8	720	100, E	1000,0	Clear
	1639	12.87	8555	7,12	9.42	198,0	17.9	8,06		(000.0	Cles
4	1649	12.43	8540	7.17	10,49	703,4	18,5	Belowing	100,0	1000,0	
5								,			
6	0612	Purged	well for	5 mm	to cla	line		6.58	100.0	500.0	
	5617	9.85	8475	7.24	10,42	226.2	4.41	-	)		Cle
8		·							"-		
9						,					
10										reusyi	

Yes Stabilized: (No) Total Volume Removed: 4೦೦೦,೦ mL

Comments:



# **Chain of Custody Record**

Project Nam	ne:	Event:	Work Order Number:	==
	MDU Lewis and Clark	Spring 2018	82-1391	
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):	

	Sam				Bot	tle 7	Гуре	F	ield Para	meters	Analysis		
Lab Number	Sample ID	$D_{ate}$	Time	Sample Type	/ /	l liter	500ml Nitric	250 mi (filtered)	Sulfuric	Temp (°C)	Spec. Cond	Ha	Analysis Required
W1645	110	Bluete	1512	GW	X			X		15,61	1031	7.33	
NIEHE	117	14 Jun 18	0617	GW	X	( X	X	Х		9,85	8475		
													MDU L&C Spring 2018
						+					121		

### Comments:

Relinquished By:		Sample Condition:						
Name:	Date/Time	Location:	Temp (°C)					
1 holy	1450	Log In Walk In #2	4,0 7M562 / TM805					
2								

/ //Name:	Date/Time
Thind	14 Jun 2018
unusu	1450



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#### CASE NARRATIVE

-MVTL Lab Reference No/SDG:

201882-2163

Client:

Montana Dakota Utilities

Location:

MDU Lewis & Clark

Project Identification:

August 2018

**MVTL Laboratory Identifications:** 

18-W2741 through 18-W2749

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
Dup 1	18-W2741
Field Blank (FB)	18-W2742
MW103	18-W2743
MW109	18-W2744
MW110	18-W2745
MW119	18-W2746
MW111	18-W2747
MW117	No sample
MW118	18-W2748
MW120	18-W2749

#### I. RECEIPT

- All samples were received at the laboratory on 23 Aug 2018 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- · Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 2.3°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
  - Bottles for sample 18-W2742 were labeled as EB-Field Blank (FB). COC lists correct sample identification.
  - MW117 will be collected at a later date due to an error at sampling.

#### II. HOLDING TIMES

 With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

#### III. METHODS

Approved methodology was followed for all sample analyses.



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#### CASE NARRATIVE

-MVTL Lab Reference No/SDG:

201882-2163

Client:

**Montana Dakota Utilities** 

Location:

MDU Lewis & Clark

Project Identification:

August 2018

**MVTL Laboratory Identifications:** 

18-W2741 through 18-W2749

Page 2 of 2

#### IV. ANALYSIS

 All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.

o For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).

 Reporting limit for two alkalinity batches were elevated due to instrument performance of the method blank at the reporting limit.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

DATE:

2 OCT 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

**MVTL** 

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Page: 1 of 7

Quality Control Report
Lab IDs: 18-W2741 to 18-W2749

A 12	LCS Spike	LCS Rec	LCS % Rec	OU Lewis  Matrix Spike	Matrix Spike	Matrix Spike Orig	Matrix Spike	Matrix Spike Rec	Matrix Spike % Rec	MSD/ Dup Orig	MSD/ Dup	MSD Rec	MSD/ Dup	MSD/ Dup RPD	Known Rec	Known % Rec	Method
Analyte	Amt	%	Limits	Amt	ID	Result	Result	%	Limits	Result	Result	%	RPD	Limit (<)	(%)	Limits	Blank
Antimony - Dissolved mg/l	0.0160	106	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.001 < 0.001 < 0.001	0.1080 0.1094 0.1101	108 109 110	75-125 75-125 75-125	0.1080 0.1094 0.1101	0.1088 0.1094 0.1112	109 109 111	0.7 0.0 1.0	20 20 20	1 1	-	< 0.001
Antimony - Total mg/l	0.1000 0.1000	119 114	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.001 < 0.001 < 0.001 < 0.001 < 0.001	0.4412 0.4292 0.4266 0.4298 0.4354	110 107 107 107 109	75-125 75-125 75-125 75-125 75-125	0.4412 0.4292 0.4266 0.4298 0.4354	0.4546 0.4260 0.4256 0.4232 0.4178	114 106 106 106 104	3.0 0.7 0.2 1.5 4.1	20 20 20 20 20 20	- - - -	- - - -	< 0.001 < 0.001
Arsenic - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.002 < 0.002 < 0.002	0.1076 0.1107 0.1138	108 111 114	75-125 75-125 75-125	0.1076 0.1107 0.1138	0.1122 0.1120 0.1106	112 112 111	4.2 1.2 2.9	20 20 20		-	< 0.002
Arsenic - Total mg/l	0.1000 0.1000	97 93	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.002 0.0046 0.0069 < 0.002 0.0024	0.4088 0.4036 0.4118 0.4042 0.3970	102 100 101 101 99	75-125 75-125 75-125 75-125 75-125	0.4088 0.4036 0.4118 0.4042 0.3970	0.4186 0.4148 0.3994 0.4020 0.3866	105 103 98 100 96	2.4 2.7 3.1 0.5 2.7	20 20 20 20 20 20	- - -	- - - -	< 0.002 < 0.002
Barium - Dissolved mg/l	0.0160	101	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	0.0205 0.0046 0.0145	0.1282 0.1075 0.1105	108 103 96	75-125 75-125 75-125	0.1282 0.1075 0.1105	0.1284 0.1092 0.1100	108 105 96	0.2 1.6 0.5	20 20 20	- - -	- - -	< 0.002
Barium - Total mg/l	0.1000 0.1000	98 98	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	0.0232 0.0727 0.3019 0.0451 0.0501	0.4272 0.4806 0.6974 0.4376 0.4406	101 102 99 98 98	75-125 75-125 75-125 75-125 75-125	0.4272 0.4806 0.6974 0.4376 0.4406	0.4216 0.4888 0.7058 0.4374 0.4432	100 104 101 98 98	1.3 1.7 1.2 0.0 0.6	20 20 20 20 20 20	- - - -	- - -	< 0.002 < 0.002
Beryllium - Dissolved mg/l	0.0160	102	80-120	0.100	18-W2748	< 0.0005	0.1078	108	75-125	0.1078	0.1092	109	1.3	20	_	-	< 0.000:

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**Quality Control Report** 

**Lab IDs:** 18-W2741 to 18-W2749

Project: MDU Lewis & Clark

Work Order: 201882-2163

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)		. Known Known 瘣d:瘣 Limits	Method Blank
Beryllium - Total mg/l	0.1000 0.1000	100 100	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.0005 < 0.0005 < 0.0005 < 0.0005 < 0.0005	0.4108 0.4096	102 103 103 102 103	75-125 75-125 75-125 75-125 75-125	0.4096 0.4132 0.4108 0.4096 0.4108	0.4202 0.4192 0.4052 0.4078	105 105 101 102 102	2.6 1.4 1.4 0.4 0.4	20 20 20 20 20 20	- - -	-	< 0.0005 < 0.0005
Boron - Dissolved mg/l	0.40 0.40 0.40	105 108 110	80-120 80-120 80-120	0.400 0.400	18-W2733 18-W2753	0.16 0.53	0.55 0.89	98 90	75-125 75-125	0.55 0.89	0.55 0.90	98 92	0.0 1.1	20 20 -	-	-	< 0.1 < 0.1
Boron - Total mg/l	0.40 0.40 0.40 0.40	105 108 110 110	80-120 80-120 80-120 80-120	0.400 0.400 2.00 0.400 0.400	18-D2985 18-W2738 18-W2749 18-W2753 18-W2761	2.39 0.48 6.61 0.53 0.45	2.89 0.91 8.50 0.93 0.87	125 108 94 100 105	75-125 75-125 75-125 75-125 75-125	2.89 0.91 8.50 0.93 0.87	2.89 0.89 8.57 0.93 0.83	125 102 98 100 95	0.0 2.2 0.8 0.0 4.7	20 20 20 20 20 20	- - -	-	<0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Cadmium - Dissolved mg/l	0.0160	105	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq ê	< 0.0005 < 0.0005 0.0024	0.1052 0.1086 0.1094	105 109 107	75-125 75-125 75-125	0.1052 0.1086 0.1094	0.1044 0.1106 0.1112	104 111 109	0.8 1.8 1.6	20 20 20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000 0.1000	114 112	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.0005 < 0.0005 < 0.0005 < 0.0005 < 0.0005	0.4238	108 106 104 106 107	75-125 75-125 75-125 75-125 75-125	0.4306 0.4252 0.4166 0.4238 0.4290	0.4482 0.4286 0.4194 0.4072 0.4190	112 107 105 102 105	4.0 0.8 0.7 4.0 2.4	20 20 20 20 20 20	- - - -	- - - -	< 0.0005 < 0.0005
Calcium - Dissolved mg/l	20.0	112	80-120	100	18W2743q	90.3	186	96	75-125	186	188	98	1.1	20	-		< 1 < 1

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**Quality Control Report** 

**Lab IDs:** 18-W2741 to 18-W2749

Project: MDU Lewis & Clark

Work Order: 201882-2163

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Calcium - Total mg/l	20.0 20.0 20.0 20.0 20.0	114 116 112 112	80-120 80-120 80-120 80-120	100 100 100	18W2698q 18W2745q 18W2757q	48.4 86.8 74.9	148 184 172	100 97 97	75-125 75-125 75-125	148 184 172	149 185 172	101 98 97	0.7 0.5 0.0	20 20 20 20	-	- - - - -	<1 <1 <1 <1 <1 <1 <1
Chloride mg/l	30.0 30.0	92 92	80-120 80-120	30.0	18-W2698	1.6	31.0	98	80-120	31.0	30.9	98	0.3	20	-	-	< 1 < 1
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.002 < 0.002 < 0.002	0.0966 0.1005 0.0999	97 100 100	75-125 75-125 75-125	0.0966 0.1005 0.0999	0.0980 0.1006 0.0986	98 101 99	1.4 0.1 1.3	20 20 20	-	-	< 0.002
Chromium - Total mg/l	0.1000 0.1000	99 94	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.002 0.0032 < 0.002 < 0.002 < 0.002	0.3876 0.3944 0.3856 0.3880 0.3836	97 98 96 97 96	75-125 75-125 75-125 75-125 75-125	0.3876 0.3944 0.3856 0.3880 0.3836	0.3966 0.4008 0.3814 0.3878 0.3766	99 99 95 97 94	2.3 1.6 1.1 0.1 1.8	20 20 20 20 20 20	-	- - - -	< 0.002 < 0.002
Cobalt - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.002 < 0.002 < 0.002	0.0965 0.1016 0.0994	96 102 99	75-125 75-125 75-125	0.0965 0.1016 0.0994	0.0994 0.1010 0.0994	99 101 99	3.0 0.6 0.0	20 20 .0	-	- - -	< 0.002
Cobalt - Total mg/l	0.1000 0.1000	100 95	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.002 < 0.002 < 0.002 0.0023 < 0.002	0.3916 0.3998 0.3860 0.3928 0.3874	98 100 96 98 97	75-125 75-125 75-125 75-125 75-125	0.3916 0.3998 0.3860 0.3928 0.3874	0.3988 0.4014 0.3824 0.3876 0.3830	100 100 96 96 96	1.8 0.4 0.9 1.3 1.1	20 20 20 20 20 20	- - -	- - - -	< 0.002 < 0.002

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Quality Control Report
Lab IDs: 18-W2741 to 18-W2749

Lab IDs: 18-W2741 to 18-W	12149	r i	oject: MI	JO Lewis	o & Clark		WOLK OL	der: 201		<del></del>		Pasenta		44.50.00	Nation 1000 (100) (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (100) (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (1000 (100) (1000 (1000 (1000 (100) (1000 (1000 (1000 (1000 (1000 (100) (1000 (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (1000 (100) (100) (100) (1000 (100) (100) (1000 (100) (100) (1000 (100) (100) (100) (1000 (100) (100) (100) (100) (100) (100) (100) (1000 (100)	<b>,</b>	1
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Fluoride mg/l	0.50 0.50 0.50	ÿ □ 102 102	90-110 90-110 90-110	0.500 0.500 0.500	18-W2748 18-W2743 18-W2761	1.28 0.75 < 0.1	1.84 1.22 0.58	112 94 116	80-120 80-120 80-120	1.84 1.22 0.58	1.83 1.21 0.58	110 92 116	0.5 0.8 0.0	20 20 20	-	-	< 0.1 < 0.1 < 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	102	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.0005 < 0.0005 < 0.0005	0.0915 0.0982 0.0944	92 98 94	75-125 75-125 75-125	0.0915 0.0982 0.0944	0.0930 0.0985 0.0954	93 98 95	1.6 0.3 1.1	20 20 20	-	-	< 0.000:
Lead - Total mg/l	0.1000 0.1000	102 98	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.0005 0.0016 < 0.0005 < 0.0005 < 0.0005	0.4028 0.3980 0.3976 0.3782 0.3750	101 99 99 95 94	75-125 75-125 75-125 75-125 75-125	0.4028 0.3980 0.3976 0.3782 0.3750	0.4018 0.3980 0.4002 0.3786 0.3790	100 99 100 95 95	0.2 0.0 0.7 0.1 1.1	20 20 20 20 20 20	- - - -	- - - -	< 0.000: < 0.000:
Lithium - Dissolved mg/l	0.400 0.400	106 106	80-120 80-120	0.400	5	0.089	0.460	93	75-125	0.460	0.462	93	0.4	20	-	-	< 0.02
Lithium - Total mg/l	0.400 0.400	106 106	80-120 80-120	0.400	18-W2749	0.091	0.506	104	75-125	0.506	0.505	104	0.2	20	-	-	< 0.02 < 0.02 < 0.02
Magnesium - Dissolved mg/l	20.0	108	80-120	100	18W2743q	114	206	92	75-125	206	208	94	1.0	20	-	-	< 1 < 1
Magnesium - Total mg/l	20.0 20.0 20.0 20.0 20.0	114 114 111 110	80-120 80-120 80-120 80-120	100 100 100	18W2698q 18W2745q 18W2757q	19.6 53.1 52.6	121 152 152	101 99 99	75-125 75-125 75-125	121 152 152	121 151 151	101 98 98	0.0 0.7 0.7	20 20 20	- - - - -	25 - - -	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Mercury - Dissolved mg/l	0.0020	105	85-115	0.002 0.002	18-W2753 18-W2782	< 0.0002 < 0.0002	0.0023 0.0021	115 105	70-130 70-130	0.0023 0.0021	0.0020 0.0021	100 105	14.0	20 20	-	-	< 0.0002

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Quality Control Report
Lab IDs: 18-W2741 to 18-W2749

Project: MDILL avvis & Clark

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury - Total mg/l	0.0020 0.0020	110 105	85-115 85-115	0.100 0.002 0.002	18-M2220 18-W2746 18-W2650q	< 0.01 < 0.0002 < 0.0002	0.1009 0.0020 0.0021	101 100 105	70-130 70-130 70-130	0.1009 0.0020 0.0021	0.1150 0.0022 0.0020	115 110 100	13.1 9.5 4.9	20 20 20	-	-	< 0.0002 < 0.0002
Molybdenum - Dissolved mg/l	0.0160	104	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.002 < 0.002 < 0.002	0.1056 0.1052 0.1064	106 105 106	75-125 75-125 75-125	0.1056 0.1052 0.1064	0.1072 0.1048 0.1062	107 105 106	1.5 0.4 0.2	20 20 20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000 0.1000	116 113	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.002 0.0031 0.0108 0.0029 0.0320	0.4350 0.4266 0.4332 0.4386 0.4662	109 106 106 109 109	75-125 75-125 75-125 75-125 75-125	0.4350 0.4266 0.4332 0.4386 0.4662	0.4478 0.4248 0.4262 0.4324 0.4536	112 105 104 107 105	2.9 0.4 1.6 1.4 2.7	20 20 20 20 20 20	- - - -	- - - -	< 0.002 < 0.002
Nitrate-Nitrite as N mg/l	0.50 0.50	98 102	90-110 90-110	1.00 1.00	18-W2742 18-W2754	< 0.1 < 0.1	1.08 0.99	108 99	90-110 90-110	1.08 0.99	1.02 1.04	102 104	5.7 4.9	20 20	-	-	< 0.1 < 0.1
pH units	- - -	-	- -	-	- - -	- - -	-	-	-	8.7 7.4 7.3	8.7 7.1 7.3	-	0.0 4.1 0.0	20 20 20	-	-	-
Potassium - Dissolved mg/l	10.0	101	80-120	20.0	18W2743q	8.5	29.0	102	75-125	29.0	29.6	106	2.0	20	-	-	< 1 < 1
Potassium - Total mg/l	10.0 10.0 10.0 10.0	108 107 104 103	80-120 80-120 80-120 80-120	20.0 20.0 20.0	18W2698q 18W2745q 18W2757q	3.6 7.2 9.5	24.4 27.7 29.5	104 102 100	75-125 75-125 75-125	24.4 27.7 29.5	24.3 27.3 29.5	104 100 100	0.4 1.5 0.0	20 20 20	- - - -	- - - - -	< 1 < 1 < 1 < 1 < 1 < 1 < 1

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**Quality Control Report** 

**Lab IDs:** 18-W2741 to 18-W2749

Project: MDU Lewis & Clark

Work Order: 201882-2163

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Selenium - Dissolved mg/l	0.0160 0.0160	97 108	80-120 80-120	0.100 0.100 0.100 0.200	18W2534q 18W2534sdq 18W2736q 18-W2743	< 0.005 < 0.005 < 0.005 0.0523	0.1140 0.1206 0.1194 0.2142	114 121 119 81	75-125 75-125 75-125 75-125	0.1140 0.1206 0.1194 0.2142	0.1186 0.1220 0.1196 0.2225	119 122 120 85	4.0 1.2 0.2 3.8	20 20 20 20 20	- - -	-	< 0.005 < 0.005
Selenium - Total mg/l	0.1000 0.1000	96 94	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18-W2749 18-W2753	< 0.01 < 0.01 < 0.01 < 0.005 < 0.005	0.3880 0.4042 0.3894 0.4360 0.4030	97 101 97 109 101	75-125 75-125 75-125 75-125 75-125	0.3880 0.4042 0.3894 0.4360 0.4030	0.3990 0.3946 0.3746 0.4238 0.4242	100 99 94 106 106	2.8 2.4 3.9 2.8 5.1	20 20 20 20 20 20	-	- - -	< 0.005 < 0.005
Sodium - Dissolved mg/l	20.0	106	80-120	100	18W2743q	90.1	183	93	75-125	183	185	95	1.1	20	-	-	< 1 < 1
Sodium - Total mg/l	20.0 20.0 20.0 20.0 20.0	111 112 110 106	80-120 80-120 80-120 80-120	100 100 100	18W2698q 18W2745q 18W2757q	134 81.8 22.0	225 177 122	91 95 100	75-125 75-125 75-125	225 177 122	227 177 122	93 95 100	0.9 0.0 0.0	20 20 20	-	-	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Sulfate mg/l	100 100 100	108 102 102	80-120 80-120 80-120	100 500 100	18-W2698 18-D2999 18-W2757	32.4 139 90.9	141 676 177	109 107 86	80-120 80-120 80-120	141 676 177	141 665 177	109 105 86	0.0 1.6 0.0	20 20 20	-	-	< 5 < 5 < 5
Thallium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100 0.100	18W2534q 18W2534sdq 18W2736q	< 0.0005 < 0.0005 < 0.0005	0.0932 0.0998 0.0969	93 100 97	75-125 75-125 75-125	0.0932 0.0998 0.0969	0.0942 0.0999 0.0978	94 100 98	1.1 0.1 0.9	20 20 20	-	-	< 0.0005

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**Quality Control Report** 

**Lab IDs:** 18-W2741 to 18-W2749

Project: MDU Lewis & Clark

Work Order: 201882-2163

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Thallium - Total mg/l	0.1000 0.1000	99 96	80-120 80-120	0.400 0.400 0.400 0.400 0.400	18W2674q 18W2704q 18W2738q 18W2749q 18W2753q	< 0.0005 < 0.0005 < 0.0005 < 0.0005 < 0.0005	0.4000 0.3988 0.3832	101 100 100 96 95	75-125 75-125 75-125 75-125 75-125	0.4046 0.4000 0.3988 0.3832 0.3786	0.4042 0.4002 0.3988 0.3828 0.3824	101 100 100 96 96	0.1 0.0 0.0 0.1 1.0	20 20 20 20 20 20	-	-	< 0.0005 < 0.0005
Total Alkalinity mg/l CaCO3	410 410 410	100 94 100	90-110 90-110 90-110	410 410 410	18-D3008 18-D3015 18-W2748	768 1080 384	1159 1471 776	95 95 96	80-120 80-120 80-120	1159 1471 776	1157 1468 772	95 95 95	0.2 0.2 0.5	20 20 20	98	80-120	< 20 < 20 < 22 < 22
Total Dissolved Solids mg/l	_	-	-	-		-	-	-	-	8060	8070	-	0.1	20	-	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	- -	2750 6 4	2750 6 4	-	0.0 0.0 0.0	20 * *	-	-	< 2 < 2

<sup>\*</sup> Due to result < 10 mg/L, data reported based on acceptance criteria of an Absolute Difference of ± 3 mg/L.

Approved by: C. Canto



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup 1

Event and Year: August 2018

Page: 1 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2741 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18

Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive	ed	Method RL	Method Reference	Date Analyzed	Analyst
Matal Discrition	677			EDA 200 2	22 Aug 10	svs
Metal Digestion pH	* 7.7	units	N/A	EPA 200.2 SM4500 H+ B	23 Aug 18 23 Aug 18 17:00	SVS
Total Suspended Solids	< 2	mg/1	2	I3765-85	23 Aug 18 16:12	SVS
Total Alkalinity	372	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Fluoride	0.50	mg/1 cacos	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	199	mg/1	5.00	ASTM D516-07	23 Aug 18 11:42	EMS
Chloride	23.4	mg/l	1.0	SM4500-C1-E	29 Aug 18 9:53	EV
Nitrate-Nitrite as N	7.50	mg/1	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Total Mercury - Dissolved		mg/1				EMS
Total Dissolved Solids	< 0.0002 741		0.0002	EPA 245.1	30 Aug 18 13:28	SVS
	96.2	mg/l		11750-85	27 Aug 18 9:25 31 Aug 18 13:06	SZ
Calcium - Total		mg/1	1.0	6010D		
Magnesium - Total	59.4	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	91.2	mg/l	1,0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	8.5	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.034	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	0.26	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	95.1	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	59.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	91.6	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	8.7	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.026	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	0.25	mg/l	0.10	6010D	6 Sep 18 12:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0357	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0044	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	вв
Antimony - Dissolved	< 0.001	mg/1	0.0010	6020B	27 Aug 18 14:14	ВВ
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0300	mg/l	0.0020	6020B	27 Aug 18 14:14	вв

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to concentration of other analytes
! = Due to sample quantity # = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup 1

Event and Year: August 2018

2 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2741 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18

Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0039	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

<sup>\*</sup> Holding time exceeded

Approved by:

Claudette K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

G = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response

<sup>^</sup> Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: Field Blank (FB)

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2742 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Da:	te alyze	i	Analyst
Metal Digestion		7.70	P1.X3	EPA 200.2	23	Aug	1.8	SVS
pH	* 6.2	units	N/A	SM4500 H+ B	23	Aug	18 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	13765-85	23	Aug	18 16:12	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	23	Aug	18 17:00	svs
Fluoride	< 0.1	mg/1	0.10	SM4500-F-C	29	Aug	18 17:00	svs
Sulfate	< 5	mg/l	5.00	ASTM D516-07	23	Aug	18 11:42	EMS
Chloride	< 1	mq/1	1.0	SM4500-C1-E	29	Aug	18 9:53	EV
Nitrate-Nitrite as N	< 0.1	mg/1	0.10	EPA 353.2	27	Aug	18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30	Aug	18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	30	Aug	18 13:28	EMS
Total Dissolved Solids	< 10	mg/1	10	I1750-85	27	Aug	18 9:25	svs
Calcium - Total	< 1	mg/1	1.0	6010D	31	Aug	18 13:06	SZ
Magnesium - Total	< 1	mg/l	1.0	6010D	31	Aug	18 13:06	SZ
Sodium - Total	< 1	mg/1	1.0	6010D	31	Aug	18 13:06	SZ
Potassium - Total	< 1	mg/l	1.0	6010D	31	Aug	18 13:06	SZ
Lithium - Total	< 0.02	mg/l	0.020	6010D	18	Sep	18 13:25	SZ
Boron - Total	< 0.1	mg/1	0.10	6010D	6	Sep	18 9:57	SZ
Calcium - Dissolved	< 1	mg/l	1.0	6010D	10	Sep	18 9:34	BB
Magnesium - Dissolved	< 1	mg/l	1.0	6010D	10	Sep	18 9:34	BB
Sodium - Dissolved	< 1	mg/l	1.0	6010D	10	Sep	18 9:34	BB
Potassium - Dissolved	< 1	mg/l	1.0	6010D	10	Sep	18 9:34	BB
Lithium - Dissolved	< 0.02	mg/1	0.020	6010D	18	Sep	18 15:25	SZ
Boron - Dissolved	< 0.1	mq/1	0.10	6010D	6	Sep	18 13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	31	Aug	18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31	Aug	18 11:56	BB
Barium - Total	< 0.002	mg/l	0.0020	6020B	31	Aug	18 11:56	BB
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	31	Aug	18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31	Aug	18 11:56	BB
Chromium - Total	< 0.002	mg/1	0.0020	6020B	31	Aug	18 11:56	BB
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	31	Aug	18 11:56	BB
Lead - Total	< 0.0005	mg/1	0.0005	6020B			18 11:56	BB
Molybdenum - Total	< 0.002	mg/l	0.0020	6020B			18 11:56	BB
Selenium - Total	< 0.01	mg/l	0.0050	6020B			18 11:56	BB
Thallium - Total	< 0.0005	mg/1	0.0005	6020B			18 11:56	BB
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B		0.27	18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B			18 14:14	вв
Barium - Dissolved	< 0.002	mg/1	0.0020	6020B			18 14:14	BB

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### = Due to complete the configuration of t

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: Field Blank (FB)

Event and Year: August 2018

Page: 2 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2742 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 Date Received: 23 Aug 18 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Da i	e lyzed		Analyst
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30	Aug 1	8 8:51	вв
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 1	8 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 1	8 14:14	BB
Molybdenum - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug 1	8 14:14	BB
Selenium - Dissolved	< 0.005	mg/1	0.0050	6020B	27	Aug 1	8 14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 1	8 14:14	BB

<sup>\*</sup> Holding time exceeded

Approved by: Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW103

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2743 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18 17:08 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed		Analyst	
Metal Digestion		7.7.7		EPA 200.2	23 Aug 1	8	svs	-
рН	* 7.7	units	N/A	SM4500 H+ B	23 Aug 1		SVS	
Total Suspended Solids	6	mg/1	2	I3765-85	23 Aug 1	8 16:12	SVS	
pH - Field	7.25	units	NA	SM 4500 H+ B	21 Aug 1	8 17:08	JSM	
Temperature - Field	14.6	Degrees C	NA	SM 2550B	21 Aug 1	8 17:08	JSM	
Total Alkalinity	365	mg/l CaCO3	20	SM2320-B	23 Aug 1	8 17:00	SVS	
Conductivity - Field	1437	umhos/cm	1	EPA 120.1	21 Aug 1	8 17:08	JSM	
Fluoride	0.75	mg/l	0.10	SM4500-F-C	29 Aug 1	8 17:00	svs	
Sulfate	421	mg/l	5.00	ASTM D516-07	29 Aug 1		EV	
Chloride	24.2	mg/1	1.0	SM4500-C1-E	29 Aug 1	8 10:32	EV	
Nitrate-Nitrite as N	5.40	mg/1	0.10	EPA 353.2	27 Aug 1	8 12:38	EV	
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 1	8 12:27	EMS	
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 1	8 13:28	EMS	
Total Dissolved Solids	1010	mg/l	10	I1750-85	27 Aug 1	8 9:25	SVS	
Calcium - Total	92.7	mg/l	1.0	6010D	31 Aug 1	8 13:06	SZ	
Magnesium - Total	121	mg/l	1.0	6010D	31 Aug 1	8 13:06	SZ	
Sodium - Total	93.4	mg/1	1.0	6010D	31 Aug 1	8 13:06	SZ	
Potassium - Total	8.9	mg/l	1.0	6010D	31 Aug 1	8 13:06	SZ	
Lithium - Total	0.047	mg/l	0.020	6010D	18 Sep 1	8 13:25	SZ	
Boron - Total	1.38	mg/1	0.10	6010D	6 Sep 1	8 9:57	SZ	
Calcium - Dissolved	90.3	mg/l	1.0	6010D	10 Sep 1	8 9:34	BB	
Magnesium - Dissolved	114	mg/l	1.0	6010D	10 Sep 1	8 9:34	BB	
Sodium - Dissolved	90.1	mg/1	1.0	6010D	10 Sep 1	8 9:34	BB	
Potassium - Dissolved	8.5	mg/l	1.0	6010D	10 Sep 1	8 9:34	BB	
Lithium - Dissolved	0.040	mg/l	0.020	6010D	18 Sep 1	8 15:25	SZ	
Boron - Dissolved	1.34	mg/1	0.10	6010D	6 Sep 1		SZ	
Antimony - Total	0.0053	mg/l	0,0010	6020B	31 Aug 1		BB	
Arsenic - Total	0.0029	mg/l	0.0020	6020B	31 Aug 1	8 11:56	BB	
Barium - Total	0.0269	mg/l	0.0020	6020B	31 Aug 1	8 11:56	BB	
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 1	8 11:56	BB	
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 1	8 11:56	BB	
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 1	8 11:56	BB	
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 1	8 11:56	BB	
Lead - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 1	8 11:56	BB	
Molybdenum - Total	0.0251	mg/l	0.0020	6020B	31 Aug 1		BB	
Selenium - Total	0.0499	mg/1	0.0050	6020B	31 Aug 1	8 11:56	BB	
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 1	8 11:56	BB	

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below: 0 = Due to sample matrix # = Due to constant # = Due to sample quantity # = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW103

Event and Year: August 2018

Page: 2 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2743 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18 17:08 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Da An	te alyze	d	Analyst
Antimony - Dissolved	0.0046	mg/l	0.0010	6020B	27	Aug	18 14:14	BB
Arsenic - Dissolved	0.0032	mg/l	0.0020	6020B	27	Aug	18 14:14	BB
Barium - Dissolved	0.0220	mg/1	0.0020	6020B	27	Aug	18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30	Aug	18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27	Aug	18 14:14	BB
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug	18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug	18 14:14	BB
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	27	Aug	18 14:14	BB
Molybdenum - Dissolved	0.0224	mg/l	0.0020	6020B	27	Aug	18 14:14	BB
Selenium - Dissolved	0.0523	mg/l	0.0050	6020B	2	Oct	18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug	18 14:14	BB

\* Holding time exceeded

Approved by:

Claudite K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: MW109

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2744 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 7:35 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	svs
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	11	mg/1	2	13765-85	23 Aug 18 16:12	svs
pH - Field	7.23	units	NA	SM 4500 H+ B	22 Aug 18 7:35	JSM
Temperature - Field	12.6	Degrees C	NA	SM 2550B	22 Aug 18 7:35	JSM
Total Alkalinity	368	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1566	umhos/cm	1	EPA 120.1	22 Aug 18 7:35	JSM
Fluoride	0.85	mg/1	0.10	SM4500-F-C	29 Aug 18 17:00	svs
Sulfate	522	mg/1	5.00	ASTM D516-07	29 Aug 18 13:38	EV
Chloride	25.0	mg/l	1.0	SM4500-C1-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	5.85	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	1140	mg/1	10	I1750-85	27 Aug 18 9:25	SVS
Calcium - Total	103	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	150	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	92.6	mg/1	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	9.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.054	mg/1	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	1.65	mg/l	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	99.6	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	144	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	88.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	9.0	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.046	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	1.65	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	0.0069	mg/1	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	0.0027	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0273	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	0.0072	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0285	mg/l	0.0020	6020B	31 Aug 18 11:56	вв
Selenium - Total	0.0528	mg/1	0,0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	BB

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW109

Event and Year: August 2018

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Report Date: 2 Oct 18 Lab Number: 18-W2744 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	0.0052	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	0.0028	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0197	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0246	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	0.0607	mg/l	0.0050	6020B	2 Oct 18 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB

\* Holding time exceeded

Approved by:

Claudate K Canteo DOCTIE

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\emptyset$  = Due to sample matrix  $\mathbb{H}$  = Due to co : = Due to sample quantity + = Due to in

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW110

Event and Year: August 2018

Page: 1 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2745 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18 12:22 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion	7 10 1	17837		EPA 200.2	23 Aug 18	svs
pH	* 7.7	units	N/A	SM4500 H+ B	23 Aug 18 17:00	SVS
Total Suspended Solids	2	mg/l	2	13765-85	23 Aug 18 16:12	svs
pH - Field	7.21	units	NA	SM 4500 H+ B	21 Aug 18 12:22	JSM
Temperature - Field	16.6	Degrees C	NA	SM 2550B	21 Aug 18 12:22	JSM
Total Alkalinity	350	mg/l CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	1039	umhos/cm	1	EPA 120.1	21 Aug 18 12:22	JSM
Fluoride	0.52	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	186	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	18.6	mg/l	1.0	SM4500-C1-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	5.15	mg/l	0.10	EPA 353.2	27 Aug 18 12:38	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 12:27	EMS
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	663	mg/1	10	I1750-85	27 Aug 18 9:25	svs
Calcium - Total	86.8	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Magnesium - Total	53.1	mg/1	1.0	6010D	31 Aug 18 13:06	SZ
Sodium - Total	81.8	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Potassium - Total	7.2	mg/l	1.0	6010D	31 Aug 18 13:06	SZ
Lithium - Total	0.030	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	0.22	mg/1	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	85.8	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	52.6	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	81.0	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	7.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.024	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	0.22	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	31 Aug 18 11:56	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Barium - Total	0.0312	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Chromium - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 11:56	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 11:56	BB
Molybdenum - Total	0.0037	mg/l	0.0020	6020B	31 Aug 18 11:56	BB
Selenium - Total	< 0.01 ^	mg/l	0.0050	6020B	31 Aug 18 11:56	BB
Thallium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 11:56	BB

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix ### Due to com

! = Due to sample quantity += Due to interpret the continuous formula in 
# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW110

Event and Year: August 2018

Page: 2 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2745 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18 12:22 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analy:	zed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Au	g 18 14:14	ВВ
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Au	18 14:14	BB
Barium - Dissolved	0.0301	mg/1	0.0020	6020B	27 Au	18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020B	30 Au	18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Au	18 14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Au	18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Au	18 14:14	BB
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Au	18 14:14	BB
Molybdenum - Dissolved	0.0038	mg/1	0.0020	6020B	27 Au	18 14:14	BB
Selenium - Dissolved	< 0.005	mg/1	0.0050	6020B	27 Au	18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Au	18 14:14	BB

<sup>\*</sup> Holding time exceeded

Approved by:

Claudette K. Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response

Elevated result due to instrument performance at the lower limit of quantification (LLOQ).



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31 Aug 18 16:36 BB

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr

Lab Number: 18-W2746 Work Order #: 82-2163 Account #: 002800 Billings MT 59102

Page:

Date Sampled: 21 Aug 18 14:00 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

1 of 2

Report Date: 2 Oct 18

Project Name: MDU Lewis & Clark

Sample Description: MW119

Event and Year: August 2018

	As Receive Result	ed	Method RL	Method Reference	Date Anal	yzed		Analyst
Metal Digestion			W	EPA 200.2	23 I	ug 18	ČV.Z.T.A	svs
pH	* 7.7	units	N/A	SM4500 H+ B	23 7	ug 18	17:00	SVS
Total Suspended Solids	< 2	mg/1	2	13765-85	23 7	ug 18	16:12	SVS
pH - Field	7.20	units	NA	SM 4500 H+ B	21 7	ug 18	14:00	JSM
Temperature - Field	16.4	Degrees C	NA	SM 2550B	21 7	ug 18	14:00	JSM
Total Alkalinity	380	mg/1 CaCO3	20	SM2320-B	23 F	ug 18	17:00	SVS
Conductivity - Field	1155	umhos/cm	1	EPA 120.1	21 7	ug 18	14:00	JSM
Fluoride	0.49	mg/l	0.10	SM4500-F-C	29 7	ug 18	17:00	SVS
Sulfate	213	mg/l	5.00	ASTM D516-07	29 7	ug 18	14:02	EV
Chloride	23.3	mg/1	1.0	SM4500-C1-E	29 F	ug 18	10:32	EV
Nitrate-Nitrite as N	7.70	mg/l	0.10	EPA 353.2	27 7	ug 18	12:38	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Z	ug 18	12:27	EMS
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	30 Z	ug 18	13:28	EMS
Total Dissolved Solids	754	mg/l	10	I1750-85	27 1	ug 18	9:25	SVS
Calcium - Total	97.0	mg/1	1.0	6010D	31 7	ug 18	13:06	SZ
Magnesium - Total	59.9	mg/l	1.0	6010D			13:06	SZ
Sodium - Total	93.3	mg/l	1.0	6010D	31 /	ug 18	13:06	SZ
Potassium - Total	8.6	mg/l	1.0	6010D	31 7	ug 18	13:06	SZ
Lithium - Total	0.035	mg/1	0.020	6010D	18 5	Sep 18	13:25	SZ
Boron - Total	0.26	mg/1	0.10	6010D	6 5	Sep 18	9:57	SZ
Calcium - Dissolved	94.7	mg/l	1.0	6010D		Sep 18		вв
Magnesium - Dissolved	58.4	mg/1	1.0	6010D	10 5	Sep 18	9:34	BB
Sodium - Dissolved	90.2	mg/l	1.0	6010D	10 8	Sep 18	9:34	BB
Potassium - Dissolved	8.3	mg/l	1.0	6010D		Sep 18		BB
Lithium - Dissolved	0.026	mg/l	0.020	6010D	18 5	Sep 18	15:25	SZ
Boron - Dissolved	0.26	mg/1	0.10	6010D			13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B			16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 7	ug 18	16:36	BB
Barium - Total	0.0350	mg/l	0.0020	6020B			16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 /	aug 18	16:36	BB
Cadmium - Total	0.0005	mg/l	0.0005	6020B			16:36	вв
Chromium - Total	< 0.002	mg/1	0.0020	6020B			16:36	вв
Cobalt - Total	< 0.002	mg/l	0.0020	6020B			16:36	BB
Lead - Total	< 0.0005	mg/1	0.0005	6020B			16:36	BB
Molybdenum - Total	0.0042	mg/l	0.0020	6020B			16:36	ВВ
Selenium - Total	< 0.005	mg/1	0.0050	6020B			10:46	вв
DOLOGIC CONT.	0.005	13	0.0005	CODOD			16.26	DD

0.0005

RL = Method Reporting Limit

Thallium - Total

The reporting limit was elevated for any analyte requiring a dilution as coded below: @ = Due to sample matrix # = Due to contain the sample quantity # = Due to interpret the sample quantity # = Due to interpret # = Due

< 0.0005

mg/1

6020B

CERTIFICATION: ND # ND-00016

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW119

Event and Year: August 2018

2 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2746 Work Order #: 82-2163 Account #: 002800

Date Sampled: 21 Aug 18 14:00 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27 Aug 18 14:14	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Barium - Dissolved	0.0334	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020B	30 Aug 18 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Aug 18 14:14	BB
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27 Aug 18 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27 Aug 18 14:14	BB
Molybdenum - Dissolved	0.0041	mg/l	0.0020	6020B	27 Aug 18 14:14	BB
Selenium - Dissolved	< 0.005	mg/1	0.0050	6020B	27 Aug 18 14:14	BB
Thallium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27 Aug 18 14:14	BB

\* Holding time exceeded

Approved by:

Claudette K Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\emptyset$  = Due to sample matrix  $\|$  = Due to code to sample quantity + = Due to in

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW111

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2747 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 11:31 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	23 Aug 18 17:00	svs
Total Suspended Solids	3	mg/1	2	13765-85	23 Aug 18 16:12	SVS
pH - Field	7.16	units	NA	SM 4500 H+ B	22 Aug 18 11:31	JSM
Temperature - Field	15.4	Degrees C	NA	SM 2550B	22 Aug 18 11:31	JSM
Total Alkalinity	419	mg/1 CaCO3	20	SM2320-B	23 Aug 18 17:00	SVS
Conductivity - Field	3307	umhos/cm	1	EPA 120.1	22 Aug 18 11:31	JSM
Fluoride	2.28	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	1760	mg/l	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	33.2	mg/l	1.0	SM4500-C1-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	9.25	mg/l	0.10	EPA 353.2	27 Aug 18 14:28	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	3200	mg/l	10	11750-85	27 Aug 18 9:25	SVS
Calcium - Total	170	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	473	mg/1	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	138	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	11.5	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Lithium - Total	0.174	mg/l	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	7.28	mg/1	0.10	6010D	6 Sep 18 9:57	SZ
Calcium - Dissolved	164	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	454	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	133	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	11.3	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.163	mg/1	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	7.16	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0234	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0821	mg/l	0.0020	6020B	31 Aug 18 16:36	вв
Selenium - Total	0.0720	mg/l	0.0050	6020B	4 Sep 18 10:46	
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW111

Event and Year: August 2018

2 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2747 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 11:31 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Dat Ana	e lyzed		Analyst	
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27	Aug 18	14:14	BB	
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug 18	14:14	BB	
Barium - Dissolved	0.0205	mg/l	0.0020	6020B	27	Aug 18	14:14	BB	
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30	Aug 18	8:51	BB	
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 18	14:14	BB	
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug 18	14:14	BB	
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug 18	14:14	BB	
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 18	14:14	BB	
Molybdenum - Dissolved	0.0750	mg/1	0.0020	6020B	27	Aug 18	14:14	BB	
Selenium - Dissolved	0.0727	mg/1	0.0050	6020B	2	Oct 18	11:31	CC	
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 18	14:14	BB	

\* Holding time exceeded

Claudette Approved by: K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to conduct to sample quantity # = Due to in

# = Due to concentration of other analytes
+ = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW118

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2748 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 13:36 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion		7777	11/1	EPA 200.2	23 Aug 18	SVS
pH	* 7.8	units	N/A	SM4500 H+ B	23 Aug 18 18:00	SVS
Total Suspended Solids	4	mg/1	2	13765-85	23 Aug 18 16:12	SVS
pH - Field	7.32	units	NA	SM 4500 H+ B	22 Aug 18 13:36	JSM
Temperature - Field	20.4	Degrees C	NA	SM 2550B	22 Aug 18 13:36	JSM
Total Alkalinity	3.84	mg/l CaCO3	20	SM2320-B	23 Aug 18 18:00	SVS
Conductivity - Field	1682	umhos/cm	1	EPA 120.1	23 Aug 18 13:36	JSM
Fluoride	1.28	mg/1	0.10	SM4500-F-C	23 Aug 18 18:00	SVS
Sulfate	597	mg/1	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Chloride	24.0	mg/l	1.0	SM4500-C1-E	29 Aug 18 10:32	EV
Nitrate-Nitrite as N	6.30	mg/l	0.10	EPA 353.2	27 Aug 18 14:28	EV
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	1230	mg/l	10	I1750-85	27 Aug 18 9:25	svs
Calcium - Total	84.5	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	178	mg/1	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	97.1	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	9.3	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Lithium - Total	0.100	mg/1	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	2.14	mg/1	0.10	6010D	6 Sep 18 10:57	SZ
Calcium - Dissolved	82.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	171	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	95.5	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	9.1	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.089	mg/1	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	2.08	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	0.0024	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0294	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0595	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	0.0573	mg/1	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix

### Due to concentration of other analytes

### Due to sample quantity

### Due to internal standard response



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Samantha Marshall Montana Dakota Utilities

5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW118

Event and Year: August 2018

2 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2748 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 13:36 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Da Ana	te alyzed		Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	27	Aug 1	8 14:14	BB
Arsenic - Dissolved	0.0024	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Barium - Dissolved	0.0226	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020B	30	Aug 1	8 8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27	Aug 1	8 14:14	BB
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug 1	8 14:14	BB
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	27	Aug 1	8 14:14	BB
Molybdenum - Dissolved	0.0526	mg/l	0.0020	6020B	27	Aug 1	8 14:14	BB
Selenium - Dissolved	0.0619	mg/l	0.0050	6020B	2	Oct 1	8 11:31	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 1	8 14:14	BB

\* Holding time exceeded

Approved by:

Claudette K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes
! = Due to sample quantity + = Due to internal standard response



1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2 North German St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890 2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724 1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2749 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 9:14 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Aug 18	svs
pH	* 7.3	units	N/A	SM4500 H+ B	23 Aug 18 18:00	SVS
Total Suspended Solids	4	mg/l	2	13765-85	23 Aug 18 16:12	SVS
	6.67	units	NA	SM 4500 H+ B	22 Aug 18 9:14	JSM
pH - Field	12.5	Degrees C	NA	SM 2550B	22 Aug 18 9:14	JSM
Temperature - Field	632	mg/l CaCO3	20	SM2320-B	23 Aug 18 18:00	SVS
Total Alkalinity	4752	umhos/cm	1	EPA 120.1	22 Aug 18 9:14	JSM
Conductivity - Field	0.42	mg/1	0.10	SM4500-F-C	23 Aug 18 18:00	svs
Fluoride	2920	mg/1	5.00	ASTM D516-07	29 Aug 18 14:02	EV
Sulfate	39.0	mg/1	1.0	SM4500-C1-E	29 Aug 18 10:32	EV
Chloride	0.62	mg/1	0.10	EPA 353.2	27 Aug 18 14:28	EV
Nitrate-Nitrite as N		mg/1	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Total	< 0.0002		0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/1	10	11750-85	27 Aug 18 9:25	svs
Total Dissolved Solids	4990	mg/1	1.0	6010D	31 Aug 18 14:06	SZ
Calcium - Total	384	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Magnesium - Total	625	mg/1	1.0	6010D	31 Aug 18 14:06	SZ
Sodium - Total	291	mg/l	1.0	6010D	31 Aug 18 14:06	SZ
Potassium - Total	22.4	mg/l		6010D	18 Sep 18 13:25	SZ
Lithium - Total	0.091	mg/l	0.020		6 Sep 18 10:57	SZ
Boron - Total	6.61	mg/l	0.10	6010D		BB
Calcium - Dissolved	374	mg/l	1.0	6010D		BB
Magnesium - Dissolved	610	mg/l	1.0	6010D		BB
Sodium - Dissolved	288	mg/l	1.0	6010D		BB
Potassium - Dissolved	22.2	mg/l	1.0	6010D	10 Sep 18 9:34	
Lithium - Dissolved	0.079	mg/1	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	6.62	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/1	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	вв
Barium - Total	0.0451	mg/l	0,0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	0.0023	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0029	mg/1	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	< 0.005	mg/l	0.0050	6020B	4 Sep 18 10:46	BB
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:  $\psi$  = Due to sample matrix # = Due to con ! = Due to sample quantity + = Due to int

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities

5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: August 2018

Page: 2 of 2

Report Date: 2 Oct 18 Lab Number: 18-W2749 Work Order #: 82-2163 Account #: 002800

Date Sampled: 22 Aug 18 9:14 Date Received: 23 Aug 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 2.3C ROI

	As Receive Result	ed	Method RL	Method Reference	Dat Ana	e lyzed		Analyst
Antimony - Dissolved	< 0,001	mg/l	0.0010	6020B	27	Aug 18	14:14	BB
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	27	Aug 18	14:14	BB
Barium - Dissolved	0.0415	mg/1	0.0020	6020B	27	Aug 18	14:14	BB
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020B	30	Aug 18	8:51	BB
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	27	Aug 18	14:14	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	27	Aug 18	14:14	BB
Cobalt - Dissolved	0.0022	mg/l	0.0020	6020B	27	Aug 18	14:14	BB
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 18	14:14	BB
Molybdenum - Dissolved	0.0029	mg/1	0.0020	6020B	27	Aug 18	14:14	BB
Selenium - Dissolved	< 0.005	mg/1	0.0050	6020B	27	Aug 18	14:14	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	27	Aug 18	14:14	вв

\* Holding time exceeded

Approved by:

Clauditte K. Canto

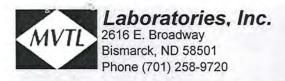
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

© = Due to sample matrix # = Due to co
! = Due to sample quantity + = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



## **Chain of Custody Record**

Project Name:		Event:	Work Order Number:	fa = 1/2	
	MDU Lewis and Clark	August 2018		82-2163	
Report To: Attn: Address:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102	Carbon Copy: Attn: Address:	Name of Sampler(s):		
phone: email:	406-896-4227		, , , , , , , , , , , , , , , , , , , ,		

	Sampl	e Information	on			Bot	tle Typ	е	Fi	eld Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric 500m.	250 mL Sulfuric		<sup>T</sup> emp (°C)	Spec. Cond.	Ha /	Analysis Required
W2741	Dup 1	Zi Ang 18	NA	GW	Х	x x	X		NA	NA	NA	
W274Z	Field Blank (FB)*	22 Aug 1B	NA	GW	X	x x	X		NA	NA	NA	
W2743	MW103	21 Ag 18	1708	GW	X	x x	X		14.57	1437	7.25	
WZ744	MW109	22 Ag1B	0735	GW	X	XX	X		12.61	1566	7.23	
W2745	MW110	21 Ag 18	1222	GW	X	XX	X		16.57	1039	7.21	
W2746	MW119	21 Ag 18	1400	GW	X	хх	X		16,45	1155	7.20	MDU L&C Spring 2018
W2747	MW111	22 Aug 18	1131	GW	Х	хх	Х		15,40	3307	7.16	minus,
	MW117 *	22 Ag 18	0940	GW	Х	хх	Х			8061	7.07	Red chem
WZ 748	MW118	22 Aug 1B	1336	GW	Х	хх	X		20,43	1682	7.32	
W2749	MW120	27 Ay 18	0914	GW	Х	хх	Х		12,50	4752	6.67	

Comments: \* Due to sampling error, MW117 will be recollected. NB 23 Aug 18 + Bottles incorrectly labeled as 6B- Field Blank (FB) is correct as noted on COC.

Relinquished By:		San	nple Condition:
Name:	Date/Time	Location:	Temp (°C)
MM	23.Aug (8)	Walk In #2	Z.3 →M562) TM805
2			

Name:	Date/Time
110 1	23 Aug 18
Buchmany	0800



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#### CASE NARRATIVE

-MVTL Lab Reference No/SDG:

201882-2203

Client:

**Montana Dakota Utilities** 

Location:

MDU Lewis & Clark

**Project Identification:** 

August 2018

**MVTL Laboratory Identifications:** 

18-W2782

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
MW117	18-W2782

#### I. RECEIPT

- All samples were received at the laboratory on 28 Aug 2018 at 1123.
- · Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 6.2°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

#### II. HOLDING TIMES

 With the exception of laboratory pH, all holding times were met for both preparation and analysis unless noted here.

#### III. METHODS

Approved methodology was followed for all sample analyses.

#### IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
  - The recoveries for one selenium dissolved matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

DATE: 20CT 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Page: 1 of 3

**Quality Control Report** Lab ID: 18-W2782

Project: MDILLewis & Clark

Work Order: 201882 2202

Lab ID: 18-W2/82		Pr	oject: Ml	OU Lewis	s & Clark	,	Work Or	der: 201	882-2203	3							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec	Method Blank
Antimony - Dissolved mg/l	0.0160	107	80-120	0.100	18W2782q	< 0.001	0.1041	104	75-125	0.1041	0.1032	103	0.9	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	114	80-120	0.400 0.400	18W2749q 18W2753q	< 0.001 < 0.001	0.4298 0.4354	107 109	75-125 75-125	0.4298 0.4354	0.4232 0.4178	106 104	1.5 4.1	20 20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100	18W2782q	< 0.002	0.1131	113	75-125	0.1131	0.1112	111	1.7	20		-	< 0.002
Arsenic - Total mg/l	0.1000	93	80-120	0.400 0.400	18W2749q 18W2753q	< 0.002 0.0024	0.4042 0.3970	101 99	75-125 75-125	0.4042 0.3970	0.4020 0.3866	100 96	0.5 2.7	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	0.0203	0.1203	100	75-125	0.1203	0.1185	98	1.5	20	_	-	< 0.002
Barium - Total mg/l	0.1000	98	80-120	0.400 0.400	18W2749q 18W2753q	0.0451 0.0501	0.4376 0.4406	98 98	75-125 75-125	0.4376 0.4406	0.4374 0.4432	98 98	0.0	20 20	-	-	< 0.002
Beryllium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	< 0.0005	0.1078	108	75-125	0.1078	0.1072	107	0.6	20	-	-	< 0.000:
Beryllium - Total mg/l	0.1000	100	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	i e	102 103	75-125 75-125	0.4096 0.4108	0.4078 0.4092	102 102	0.4 0.4	20 20	-		< 0.000:
Boron - Dissolved mg/l	0.40 0.40 0.40	105 108 110	80-120 80-120 80-120	0.400	18-W2753	0.53	0.89	90	75-125	0.89	0.90	92	1.1	20	-	1 1	< 0.1
Boron - Total mg/l	0.40 0.40	110 110	80-120 80-120	2.00 0.400 0.400	18-W2749 18-W2753 18-W2761	6.61 0.53 0.45	8.50 0.93 0.87	94 100 105	75-125 75-125 75-125	8.50 0.93 0.87	8.57 0.93 0.83	98 100 95	0.8 0.0 4.7	20 20 20	-	-	< 0.1 < 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	< 0.0005	0.1000	100	75-125	0.1000	0.1015	102	1.5	20	_	-	< 0.000
Cadmium - Total mg/l	0.1000	112	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005		106 107	75-125 75-125	0.4238 0.4290	0.4072 0.4190	102 105	4.0 2.4	20 20	-	-	< 0.0003
Calcium - Dissolved mg/l	20.0	112	80-120	100	18W2743q	90.3	186	96	75-125	186	188	98	1.1	20	-	-	< 1 < 1
Calcium - Total mg/l	20.0	109	80-120	500 500	18M2274q 18W2782q	160 431	695 960	107 106	75-125 75-125	695 960	690 960	106 106	0.7 0.0	20 20	-	-	< 1 < 1
Chloride mg/l	30.0	95	80-120	30.0	18-W2782	46.6	76.3	99	80-120	76.3	77.4	103	1.4	20		-	< 1
Chromium - Dissolved mg/l	0.0160	104	80-120	0.100	18W2782q	< 0.002	0.1020	102	75-125	0.1020	0.1036	104	1.6	20	_	_	< 0.002

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**Quality Control Report** 

Lab ID: 18-W2782 Project: MDU Lewis & Clark

Work Order: 201882-2203

Lab 1D: 18-w2/82	LCS	LCS	LCS	Matrix	Matrix	Matrix Spike	Work Or Matrix	Matrix Spike	Matrix Spike	MSD/ Dup	MSD/	MSD	MSD/	MSD/ Dup	Known	Known	
Analyte	Spike Amt	Rec %	% Rec Limits	Spike Amt	Spike ID	Orig Result	Spike Result	Rec %	% Rec Limits	Orig Result	Dup Result	Rec %	Dup RPD	RPD Limit (<)	Rec (%)	% Rec Limits	Method Blank
Chromium - Total mg/l	0.1000	94	80-120	0.400 0.400	18W2749q 18W2753q	< 0.002 < 0.002	0.3880 0.3836	97 96	75-125 75-125	0.3880 0.3836	0.3878 0.3766	97 94	0.1 1.8	20 20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.0160	105	80-120	0.100	18W2782q	< 0.002	0.1003	100	75-125	0.1003	0.0990	99	1.3	20	-	_	< 0.002
Cobalt - Total mg/l	0.1000	95	80-120	0.400 0.400	18W2749q 18W2753q	0.0023 < 0.002	0.3928 0.3874	98 97	75-125 75-125	0.3928 0.3874	0.3876 0.3830	96 96	1.3 1.1	20 20	-	-	< 0.002
Fluoride mg/I	0.50	100	90-110	0.500 0.500	18-W2743 18-W2761	0.75 < 0.1	1.22 0.58	94 116	80-120 80-120	1.22 0.58	1.21 0.58	92 116	0.8	20 20	-		< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	108	80-120	0.100	18W2782q	< 0.0005	0.0935	93	75-125	0.0935	0.0930	93	0.5	20	-		< 0.0005
Lead - Total mg/I	0.1000	98	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005	0.3782 0.3750	95 94	75-125 75-125	0.3782 0.3750	0.3786 0.3790	95 95	0.1 1.1	20 20	- -	-	< 0.0005
Lithium - Dissolved mg/l	0.400 0.400	106 106	80-120 80-120	0.400	18-W2748	0.089	0.460	93	75-125	0.460	0.462	93	0.4	20	-	-	< 0.02
Lithium - Total mg/l	0.400 0.400	106 106	80-120 80-120	0.400	18-W2749	0.091	0.506	104	75-125	0.506	0.505	104	0.2	20	-	-	< 0.02 < 0.02 < 0.02
Magnesium - Dissolved mg/l	20.0	108	80-120	100	18W2743q	114	206	92	75-125	206	208	94	1.0	20	-	-	< 1 < 1
Magnesium - Total mg/l	20.0	110	80-120	500 500	18M2274q 18W2782q	13.4 1320	550 1810	107 98	75-125 75-125	550 1810	545 1800	106 96	0.9 0.6	20 20	-	_	< 1 < 1
Mercury - Dissolved mg/l	0.0020	105	85-115	0.002 0.002	18-W2753 18-W2782	< 0.0002 < 0.0002	0.0023 0.0021	115 105	70-130 70-130	0.0023 0.0021	0.0020 0.0021	100 105	14.0 0.0	20 20	-	-	< 0.0002
Mercury - Total mg/l	0.0020	105	85-115	0.002	18-W2650q	< 0.0002	0.0021	105	70-130	0.0021	0.0020	100	4.9	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.0160	106	80-120	0.100	18W2782q	0.0043	0.1131	109	75-125	0.1131	0.1130	109	0.1	20		-	< 0.002
Molybdenum - Total mg/l	0.1000	113	80-120	0.400 0.400	18W2749q 18W2753q	0.0029 0.0320	0.4386 0.4662	109 109	75-125 75-125	0.4386 0.4662	0.4324 0.4536	107 105	1.4 2.7	20 20		-	< 0.002
Nitrate-Nitrite as N mg/l	0.50	92	90-110	1.00	18-W2784	< 0.1	0.96	96	90-110	0.96	0.96	96	0.0	20	-	_	< 0.1

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**Quality Control Report** 

Lab ID: 18-W2782

Project: MDU Lewis & Clark

Work Order: 201882-2203

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
pH units	-	-	-	-	-	-	-	-	-	8.6 8.0	8.6 8.1	-	0.0	20 20	-	-	-
Potassium - Dissolved mg/l	10.0	101	80-120	20.0	18W2743q	8.5	29.0	102	75-125	29.0	29.6	106	2.0	20	-	-	< 1 < 1
Potassium - Total mg/l	10.0	104	80-120	100 100	18M2274q 18W2782q	56.0 33.1	166 146	110 113	75-125 75-125	166 146	166 146	110 113	0.0	20 20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	97	80-120	0.100	18W2782q	0.0415	0.1770	136	75-125	0.1770	0.1773	136	0.2	20	-	-	< 0.005
Selenium - Total mg/l	0.1000	112	80-120	0.100	18W2743q	0.0523	0.2142	81	75-125	0.2142	0.2225	85	3.8	20	-	-	< 0.005
Sodium - Dissolved mg/l	20.0	106	80-120	100	18W2743q	90.1	183	93	75-125	183	185	95	1.1	20	_	-	< 1 < 1
Sodium - Total mg/l	20.0	110	80-120	500 500	18M2274q 18W2782q	710 625	1250 1160	108 107	75-125 75-125	1250 1160	1230 1150	104 105	1.6 0.9	20 20	-	-	< 1 < 1
Sulfate mg/l	100	100	80-120	1000	18-W2761	560	1590	103	80-120	1590	1540	98	3.2	20	_	-	< 5
Thallium - Dissolved mg/l	0.0160	109	80-120	0.100	18W2782q	< 0.0005	0.0944	94	75-125	0.0944	0.0958	96	1.5	20	_	-	< 0.000:
Thallium - Total mg/l	0.1000	96	80-120	0.400 0.400	18W2749q 18W2753q	< 0.0005 < 0.0005		96 95	75-125 75-125	0.3832 0.3786	0.3828 0.3824	96 96	0.1 1.0	20 20	-		< 0.0003
Total Alkalinity mg/l CaCO3	410	99	90-110	410	18-W2782	415	804	95	80-120	804	800	94	0.5	20	99	80-120	< 20 < 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	9480	9620	-	1.5	20	-	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	_	-	-	-	2600	2750	-	5.6	20	-	-	< 2

Approved by: C. Canto



## **Field Datasheet**

### **Groundwater Assessment**

Company:	MDU Lewis and Clark	
Event:	August 2018	
Sample ID:	117	
Sampling Personal:	Jen Ar	

2616 E. Broadway Ave, Bis	marck, ND							-	Sampling Pe	ersonal:	Je	mch		
Phone: (701) 258-9	720							_						
Weather Conditions:		Temp:	55	°F	Wind:	Ŋ	@ (	5-(	.ට	Precip	Sunr	ny / Partly C	loudy / Ci	oudy
	Well Info	rmation							Sa	mpling l	nformatio	on		
Well Locked?	Yes	<b>(No)</b>				Purgi	ng Meth	od:	Blad	der				
Well Labeled?	Y (§s)	No				Sampli	ing Meth	od:	Blad	der		Co	ntrol Settin	gs
Casing Straight?	(es	No				Dedica	ted Equi	p?:	Yes	<b>™</b>		Purge:		sec.
Grout Seal Intact?	Yes	No	Not V	'isible		Duplicate	Sample	?:	Yes	640		Recover:	28	sec.
Repairs Necessary:						Duplicate	Sample	ID:				PSI:	20	
Casing	Diameter:		2"											
Water Level Befo	ore Purge:	6	.26		ft	F	⊃urge Da	ate:	27 Aug	18	Time Purg	ing Began:	1051	a∰pm
							urged D		Yes '	No		urged Dry:	1136	(am/pm
					7	Sa	ample Da	ate:	26 Ay (	3	Time of	Sampling:	0637	am/pm
Depth to Top	of Pump:	9,	86		ft									
Water Level After		€,	15		ft	Bottle	1L Ra	w	500mL	Nitric	500mL Nit	ric (filtered)	250 S	Sulfuric
Measuremen	t Method:	Electric V	Vater Level	Indicator		List:								

#### **Field Measurements**

Stabil	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1056	13,86	.8194	6,92	7.16	234,5	38.3	62	100,0	5000	Cles
2	1/06	14.30	8238	7,09	6,66	253,0	27.4	7.10	100,0	1000,0	Clear
3	1116	14.67	8222	7.11	6.92	265.5	50.1	7.83	100.0	1000.0	den
4	1126	14.86	8197	7.10	7.01	272,6	34.5	8.91	100.0	1000.0	Cles
5	1136	15.01	8042	7.11	7.14	283,7	27.6	BelowPy	100,0	1000.0	Clez
6											
7	0632	Parzed G	r Smin	to clear	{: <u>~</u>			6.65		relinge	
8	0637	13,12	8167	カイナ	1:88	280,2	3,13	7.15	1800	230°2	
9	1										
10											

Stabilized: Yes No

Total Volume Removed: 5 လာ ာ mL



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark Sample Description: MW117

Event and Year: August 2018

1 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2782 Work Order #: 82-2203 Account #: 002800

Date Sampled: 28 Aug 18 6:37 Date Received: 28 Aug 18 11:23 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion			7.7	EPA 200.2	28 Aug 18	svs
pH	* 7.6	units	N/A	SM4500 H+ B	29 Aug 18 17:00	SVS
Total Suspended Solids	13	mg/1	2	13765-85	28 Aug 18 16:37	svs
pH - Field	7.17	units	NA	SM 4500 H+ B	28 Aug 18 6:37	JSM
Temperature - Field	13.1	Degrees C	NA	SM 2550B	28 Aug 18 6:37	JSM
Total Alkalinity	415	mg/l CaCO3	20	SM2320-B	29 Aug 18 17:00	SVS
Conductivity - Field	8167	umhos/cm	1	EPA 120.1	28 Aug 18 6:37	JSM
Fluoride	0.27	mg/l	0.10	SM4500-F-C	29 Aug 18 17:00	SVS
Sulfate	6610	mg/1	5.00	ASTM D516-07	29 Aug 18 14:21	EV
Chloride	46.6	mg/1	1.0	SM4500-C1-E	29 Aug 18 10:54	EV
Nitrate-Nitrite as N	19.8	mg/l	0.10	EPA 353.2	10 Sep 18 16:11	EV
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	30 Aug 18 13:28	EMS
Total Dissolved Solids	9480	mg/1	10	I1750-85	31 Aug 18 8:46	SVS
Calcium - Total	431	mg/1	1.0	6010D	10 Sep 18 14:34	BB
Magnesium - Total	1320	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Sodium - Total	625	mg/1	1.0	6010D	10 Sep 18 14:34	BB
Potassium - Total	33.1	mg/l	1.0	6010D	10 Sep 18 14:34	BB
Lithium - Total	0.124	mg/1	0.020	6010D	18 Sep 18 13:25	SZ
Boron - Total	12.1	mg/l	0.10	6010D	6 Sep 18 10:57	SZ
Calcium - Dissolved	420	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Magnesium - Dissolved	1290	mg/1	1.0	6010D	10 Sep 18 9:34	BB
Sodium - Dissolved	615	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Potassium - Dissolved	32.2	mg/l	1.0	6010D	10 Sep 18 9:34	BB
Lithium - Dissolved	0.128	mg/l	0.020	6010D	18 Sep 18 15:25	SZ
Boron - Dissolved	12.4	mg/1	0.10	6010D	6 Sep 18 13:57	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020B	31 Aug 18 16:36	BB
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Barium - Total	0.0223	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Beryllium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Cadmium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB
Chromium - Total	0.0041	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Lead - Total	< 0.0005	mg/1	0.0005	6020B	31 Aug 18 16:36	BB
Molybdenum - Total	0.0050	mg/l	0.0020	6020B	31 Aug 18 16:36	BB
Selenium - Total	0.0381	mg/1	0.0050	6020B	2 Oct 18 12:41	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020B	31 Aug 18 16:36	BB

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix

! = Due to sample quantity

+ = Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW117

Event and Year: August 2018

2 of 2 Page:

Report Date: 2 Oct 18 Lab Number: 18-W2782 Work Order #: 82-2203 Account #: 002800

Date Sampled: 28 Aug 18 6:37 Date Received: 28 Aug 18 11:23 Sampled By: MVTL Field Services

Temp at Receipt: 6.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Dat Ana	e alyze	d	Analyst
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020B	29	Aug :	18 14:29	BB
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	29	Aug :	18 14:29	BB
Barium - Dissolved	0.0203	mg/1	0.0020	6020B	29	Aug	18 14:29	BB
Beryllium - Dissolved	< 0.0005	mg/1	0.0005	6020B	29	Aug	18 14:29	BB
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29	Aug	18 14:29	BB
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	29	Aug	18 14:29	BB
Cobalt - Dissolved	< 0.002	mg/1	0.0020	6020B	29	Aug	18 14:29	BB
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	29	Aug	18 14:29	BB
Molybdenum - Dissolved	0.0043	mg/l	0.0020	6020B	29	Aug	18 14:29	BB
Selenium - Dissolved	0.0415	mg/l	0.0050	6020B	29	Aug :	18 14:29	BB
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020B	29	Aug	18 14:29	вв

\* Holding time exceeded

Approved by:

Claudette K Canto

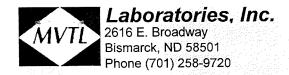
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to continuous to a Due to sample quantity # = Due to interpretations | Due t

# - Due to concentration of other analytes + - Due to internal standard response



## **Chain of Custody Record**

Project Nam	ie:	Event:	Work Order Number:
	MDU Lewis and Clark	August 2018	82-2203
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):

eritierentari su.	Samp	ole Information	b, differ		ý., svá	В	ottl	е Ту	ре	Fi	eld Para	meters	Analysis
Lab Number	Sample ID	Date	7me	Sample Type	1 liter	500mL Niltis	500mL Nitric .c.	250 mL Sulfuric		<sup>7етр</sup> (°С)	Spec. Cond.	   Ha	Analysis Required
WZ78Z	MVV117		0637	GW	Х			х		13,12	8167	7.17	
							_		-				
								$\perp$					MDU L&C Spring 2018
						_							MIDO E&C Spring 2010
								-					

Relinquished By:		Sam	ple Condition:
Name;	Date/Time	Location:	Temp (°C)
1 0 1	284,18	Login	RO16.2
	1123	Walk In #2	TM562 / T <del>M8</del> 05
2			

Name:	Date/Time
10000	28 Aug 2018
144 7V	(123



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### CASE NARRATIVE - AMENDED 3 DEC 18 (Reporting)

MVTL Lab Reference No/SDG: 201882-2900

Client: Montana Dakota Utilities

Location: MDU Lewis & Clark

Project Identification: Fall (October) 2018 (Radiochem)

MVTL Laboratory Identifications: 18-W3933 through 18-W3935

Page 1 of 2

MDU Sample Identification	MVTL Laboratory #
MW120	18-W3933
MW117	18-W3934
Dup-1	18-W3935

#### I. RECEIPT

- All samples were received at the laboratory on 31 Oct 2018 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
  - Temperature of samples upon receipt was 1.8°C.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.
- All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there. Samples were received at IML on 2 Nov 18.
  - All samples were properly preserved unless noted on the individual analytical laboratory report or on the IML Case Narrative.

#### II. HOLDING TIMES

 All holding times were met for both preparation and analysis unless noted on the individual analytical laboratory report or on the IML Case Narrative.

#### III. METHODS

- Approved methodology was followed for all sample analyses.
  - Please refer to the IML Case Narrative for more information regarding methodology.

#### IV. ANALYSIS

 All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted on the individual analytical laboratory report or on the IML Case Narrative.



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#### CASE NARRATIVE - AMENDED 3 DEC 18 (Reporting)

MVTL Lab Reference No/SDG:

201882-2900

Client:

**Montana Dakota Utilities** 

Location:

MDU Lewis & Clark

Project Identification:

Fall (October) 2018 (Radiochem)

**MVTL Laboratory Identifications:** 

18-W3933 through 18-W3935

Page 2 of 2

#### V. REPORTING

 Per email dated 1 Dec 18 from Terri Olson, Barr, the radiochem data package had results that were reported as ND rather than as actual concentrations and the QC report was missing the LCS result. IML Laboratories was contacted on 3 Dec 18 and the radiochem data package was amended to resolve these issues.

All laboratory data has been approved by MVTL Laboratories.

SIGNED:

DATE:

3 Dec 18

Claudette Carroll - MVTL Bismarck Laboratory Manager

#### **Claudette Carroll**

From:

Terri A. Olson <TOlson@barr.com>

Sent:

Saturday, December 1, 2018 6:31 PM

To:

Claudette Carroll; Barr Data Management; 'Marshall, Samantha'; Justin Soberaski

Subject:

RE: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf,

201882-2900 MDU.txt, 201882-2900 mduccr.txt

Follow Up Flag:

au wollo7

Flag Status:

Flagged

Also noted that Radium 226 is missing the LCS. There is a MB and LCSD but no LCS.

Thank-you,

www.barr.com

Terri A. Olson Senior Data Quality Specialist Minneapolis, MN office: 952.842.3578 TOlson@barr.com

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----Original Message----

From: Terri A. Olson

Sent: Saturday, December 1, 2018 5:39 PM

To: 'Claudette Carroll' <ccarroll@mvtl.com>; Barr Data Management <BarrDM@barr.com>; Marshall,

Samantha <Samantha.Marshall@mdu.com>; Justin Soberaski <jsoberaski@barr.com>

Subject: RE: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf, 201882-2900

MDU.txt, 201882-2900 mduccr.txt

Hello Claudette,

The radiochemistry results and uncertainties were reported as ND and NA instead of numbers being used as requested and handled previously.

Please request a revision from IML.

Thank-you,

Terri A. Olson Senior Data Quality Specialist Minneapolis, MN office: 952.842.3578 TOlson@barr.com www.barr.com

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----Original Message----

From: Claudette Carroll <ccarroll@mvtl.com> Sent: Friday, November 30, 2018 8:59 AM

To: Barr Data Management <BarrDM@barr.com>; Marshall, Samantha <Samantha.Marshall@mdu.com>; Terri

A. Olson <TOlson@barr.com>; Justin Soberaski <JSoberaski@barr.com>

Subject: Emailing: 201882-2900.csv, MVTLS1811037-F.xls, 201882-2900 MDU L&C.pdf, 201882-2900 MDU.txt,

201882-2900 mduccr.txt

Good morning Sam,

Attached is a data package for the radiochem sampling done at the MDU Lewis & Clark site in Oct 2018. Hard copies to follow in the mail. Please let me know if you have any questions.

Have a good Friday and a great weekend! Claudette

ccarroll@mvtl.com 701-258-9720 2616 E. Broadway Ave/Bismarck, ND 58501

Your message is ready to be sent with the following file or link attachments:

201882-2900.csv MVTLS1811037-F.xls 201882-2900 MDU L&C.pdf 201882-2900 MDU.txt 201882-2900 mduccr.txt



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW120

Event and Year: October 2018

1 of 1 Page:

Report Date: 29 Nov 18 Lab Number: 18-W3933 Work Order #: 82-2900 Account #: 002800

Date Sampled: 30 Oct 18 10:17 Date Received: 31 Oct 18 8:00 Sampled By: MVTL Field Services

PO #: 169917 OP

Temp at Receipt: 1.8C ROI

	As Rece Result	ived	Method RL	Method Reference	Date Analy	zed	Analyst
pH - Field	6.63	units	NA	SM 4500 H+ B	30 Oc	t 18 10:17	DJN
Temperature - Field	10.3	Degrees C	NA	SM 2550B	30 Oc	t 18 10:17	DJN
Conductivity - Field	4833	umhos/cm	1	EPA 120.1	30 Oc	t 18 10:17	DJN
Radium 226	See Att	ached Report			27 No	v 18	OL
Radium 228		ached Report			26 No	v 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Cantlo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

@ = Due to sample matrix
! = Due to sample quantity

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: MW117

Event and Year: October 2018

Page: 1 of 1

Report Date: 29 Nov 18 Lab Number: 18-W3934 Work Order #: 82-2900 Account #: 002800

Date Sampled: 30 Oct 18 Date Received: 31 Oct 18 8:00 Sampled By: MVTL Field Services

PO #: 169917 OP

Temp at Receipt: 1.8C ROI

	As Rece Result	ived	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.10	units	NA	SM 4500 H+ B	30 Oct 18	9:04	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	30 Oct 18	9:04	DJN
Conductivity - Field	8424	umhos/cm	1	EPA 120.1	30 Oct 18	9:04	DJN
Radium 226	See Atta	ached Report			27 Nov 18		OL
Radium 228	See Att	ached Report			26 Nov 18		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

### Due to sample matrix
### Due to co
! = Due to sample quantity
#### Due to in

# = Due to concentration of other analytes + = Due to internal standard response



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Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Lewis & Clark

Sample Description: Dup-1

Event and Year: October 2018

1 of 1 Page:

Report Date: 29 Nov 18 Lab Number: 18-W3935 Work Order #: 82-2900 Account #: 002800

Date Sampled: 30 Oct 18

Date Received: 31 Oct 18 8:00 Sampled By: MVTL Field Services

PO #: 169917 OP

Temp at Receipt: 1.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			27 Nov 18	OL
Radium 228	See Attached Report			26 Nov 18	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Clauditte K. Cantes

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below:

# = Due to sample matrix # = Due to concentration of other analytes

! = Due to sample quantity + = Due to internal standard response



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 11/28/2018

**CLIENT:** 

MVTL Laboratories, Inc.

Project:

201882-2900

Lab Order:

S1811037

**CASE NARRATIVE** 

Report ID: S1811037001

Samples 18-W3933 MW120, 18-W3934 MW117 and 18-W3935 Dup-1 were received on November 2, 2018.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition 40 CFR Parts 136 and 141 40 CFR Part 50, Appendices B, J, L, and O Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012 ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 1



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-2900

Lab ID:

S1811037-001

ClientSample ID: 18-W3933 MW120

COC:

201882-2900

PWS ID:

Report ID

Date Reported 11/28/2018

S1811037001

WorkOrder:

S1811037

CollectionDate: 10/30/2018 10:17:00 AM

DateReceived: 11/2/2018 1:15:00 PM

FieldSampler:

Matrix:

Water

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init		
L								
Radionuclides - Total								
Radium 226	0.13	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	AA	
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	AA	
Radium 228	-1.9	pCi/L		1	Ga-Tech	11/26/2018 1338	AA	
Radium 228 Precision (±)	1.2	pCi/L			Ga-Tech	11/26/2018 1338	AA	

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank
- Value above quantitation range
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Matrix Effect

#### RL - Reporting Limit

- Calculated Value
- Analyzed at IML Gillette laboratory G
- J Analyte detected below quantitation limits
- Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 1 of 3



nter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

#### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-2900

Lab ID:

S1811037-002

ClientSample ID: 18-W3934 MW117

COC: PWS ID: 201882-2900

Report ID

S1811037001

WorkOrder:

S1811037

CollectionDate: 10/30/2018 9:04:00 AM DateReceived: 11/2/2018 1:15:00 PM

Date Reported 11/28/2018

FieldSampler:

Matrix:

Water

Analyses	Result	l luit-	01		88.71	D 4 4 1 10	• .
Allalyses	Result	Units	Qual	RL	Method	Date Analyzed/I	nit
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	ΑA
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	ΑA
Radium 228	-0.3	pCi/L		1	Ga-Tech	11/26/2018 1642	AΑ
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	11/26/2018 1642	ΑA

#### These results apply only to the samples tested.

#### Qualifiers:

- Analyte detected in the associated Method Blank В
- Value above quantitation range
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Matrix Effect

#### **RL** - Reporting Limit

- С Calculated Value
- Analyzed at IML Gillette laboratory G
- Analyte detected below quantitation limits J
- М Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by: A

Wade Nieuwsma, Assistant Laboratory Manager

Page 2 of 3



1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

### Sample Analysis Report

Company:

MVTL Laboratories, Inc.

2616 E Broadway Ave.

Bismarck, ND 58501

ProjectName:

201882-2900

Lab ID:

S1811037-003 ClientSample ID: 18-W3935 Dup-1

COC:

201882-2900

PWS ID:

Date Reported

11/28/2018

Report ID

S1811037001

WorkOrder:

S1811037

CollectionDate: 10/30/2018

DateReceived:

11/2/2018 1:15:00 PM

FieldSampler:

Matrix:

Water

Comments							
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	11/27/2018 1359	AA
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	11/27/2018 1359	AA
Radium 228	8.0	pCi/L		1	Ga-Tech	11/26/2018 1946	AA
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	11/26/2018 1946	AA

#### These results apply only to the samples tested.

#### Qualifiers:

- В Analyte detected in the associated Method Blank
- Value above quantitation range
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- ND Not Detected at the Reporting Limit
- Spike Recovery outside accepted recovery limits
- Matrix Effect

#### **RL - Reporting Limit**

- Calculated Value
- Analyzed at IML Gillette laboratory G
- Analyte detected below quantitation limits J
- М Value exceeds Monthly Ave or MCL or is less than LCL
- Outside the Range of Dilutions
- Analysis reported under the reporting limit

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager

Page 3 of 3



Inter-Mountain Labs

1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

#### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** 

Work Order:

MVTL Laboratories, Inc.

S1811037

Project: 201882-2900 Date: 11/28/2018

Report ID: S1811037001

Radium 228 by Ga/Tech	Sample Type MBLK	U	nits: pCi/L			
MB-536 (11/23/18 17:19)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bat	chID 15218	
Analyte	Result	RL Sp	ke Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	ND	1				
Radium 228 by Ga/Tech	Sample Type LCS	U	nits: pCi/L			
LCS-536 (11/23/18 20:23)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bat	chID 15218	
Analyte	Result	RL Spi	ke Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	33	1 3	9	85.2	65.9 - 132	
Radium 228 by Ga/Tech	Sample Type MS	U	nits: pCi/L			
MS-536 (11/24/18 02:29)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bat	chID 15218	,
Analyte	Result	RL Spi	ke Ref Samp	%REC	% Rec Limits	Qual
Radium 228 (Dissolved)	30	1 3:	9 ND	77.9	50 - 139	
MS-536 (11/24/18 02:29)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bate	chID 15218	
Analyte	Result	RL Spi	ke Ref Samp	%REC	% Rec Limits	Qual
Total Radium 228	30	1 3	) ND	77.9	50 - 139	
Radium 228 by Ga/Tech	Sample Type MSD	U	nits: pCi/L			
MSD-536 (11/24/18 05:32)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bate	chID 15218	
Analyte	Result	RL Co		%REC	% RPD Limits	Qual
Radium 228 (Dissolved)	35	1 30	) 13.3	88.9	20	
MSD-536 (11/24/18 05:32)	RunNo: 163499	PrepDate: 1	1/07/18 0:00	Bate	chID 15218	
Analyte	Result	RL Co		%REC	% RPD Limits	Qual
Total Radium 228	35	1 30	13.3	88.9	20	
Radium 226 in Water -	Sample Type MBLK	Uı	nits: pCi/L			
MB-1930 (11/27/18 11:46)	RunNo: 163517	PrepDate: 1	1/19/18 0:00	Bato	chID 15292	
Analyte	Result	•	ke Ref Samp		% Rec Limits	Qual
Radium 226	ND	0.2				
Radium 226 in Water -	Sample Type LCS	Uı	nits: pCi/L			
LCS1930 (11/27/18 11:46)	RunNo: 163517					
Analyte	Result	RL Spi	ke Ref Samp	%REC	% Rec Limits	Qual
Radium 226	4.8	0.2 5.9	8	80.7	67.1 - 122	
Radium 226 in Water -	Sample Type LCSD	Uı	nits: pCi/L			
LCSD-1930 (11/27/18 11:46)	RunNo: 163517	PrepDate: 1	1/19/18 0:00	Bato	chID 15292	
Analyte	Result	RL Cor		%REC	% RPD Limits	Qual
Radium 226	5.2	0.2 5.2	2 0	86.9	20	

Qualifiers:

- Analyte detected in the associated Method Blank
- Analyzed at IML Gillette laboratory G
- Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- Matrix Effect

- Value above quantitation range
- Holding times for preparation or analysis exceeded
- Analyzed by another laboratory
- Outside the Range of Dilutions
- Spike Recovery outside accepted recovery limits



## LABORATORIES, Inc. 2616 E Broadway Ave Bismarck, ND 58501

## Chain of Custody Record

Page 1 of 1 .

	Phone: (701) 2	250 0700		1											
Toll Free: (8	Phone: (701) 2 00) 279-6885	258-9720 Fax: (701) 2	258-9724									201882-290	00		
Company Nam			-00 01 <u>E</u> -		Account #:							Phone #:	· · · · · · · · · · · · · · · · · · ·		
													701-258-9720		
		<u>IVTL</u>			Contact:							Fax #:			
		Broadway				Claud	ette					For faxe	ed report chec	k	
Billing Address	Bismarci (indicate if differen	k, ND 58501	~\^	·	Name of Sa	ampler:						E-mail:	ccarroll@mv		
Dining Address	(mulcate ii dilletell	t iroin above	<i>⇒)</i> .		Quote Num	hor							report check box		
	PO E	3ox 249		Quote Null	iber.						Date Submitted	ı: 31-Oct-18			
		, MN 56073			Project Nar	ne/Numbei						Purchase Order			
1 1	7				•							. 4.0.1400 01401	BL6110		
9181103	+	Sample Ir	nformation					В	ottle	Тур	эе		Analysis		
IML Lab				Commis	<b>D</b>		Untreated	ml HNO3	VOC Vials Umpreserved	Glass Jar					
Number	MVTL Lab Number	Client	Sample ID	Sample Type	Date Sampled	Time Sampled	ntre	000	oc u	lass	Other				
001	18-W3933		W120				-	- 1	<u> </u>	ග	0		nalysis Requii		
				GW	30-Oct-18	1017		4					Ra226 & Ra22	8	
202	18-W3934	M	W117	GW	30-Oct-18	0904		4					Ra226 & Ra228		
00 3	18-W3935		Dup-1	GW	30-Oct-18						- 1		D-000 0 E 00	8	
. 1		Dup-1 Gvv											Ra226 & Ra22	•	
	:												Ra226 & Ra22		
	:												Ra226 & Ra22		
	:												Ka226 & Ka22		
													Ka226 & Ka22		
													Razzo & Razz		
													Razzo & Razz		
													Razzo & Razz		
													Razzo & Razz		
Comments: All	results must be repo	orted as a ni	umerical value.										Ka226 & Ra22		
	results must be repo	orted as a n	umerical value. Time:	Sample	Condition:	Re	ecei	ved	by:				Razzo & Razz		
					74	Re			by:			Date:	13'-15	Temp:	



## **Field Datasheet**

### **Groundwater Assessment**

Company:	MDU Lewis and Clark
Event:	October 2018
Sample ID:	MW120
Sampling Demonals	

2616 E. Broadway Ave, B								Sampling P	ersonal: /	Darren	NSES	waag	
Phone: (701) 258-	9720								- I				
Weather Conditions:		Temp:	35	°F	Wind:	South	@ /0		Precip:	Sunn	y / Partly (	Cloudy / Clo	udv
	Well Info	rmation						Sa		nformatio			
Well Locked?		(No				Purgi	ng Method:						
Well Labeled?	X es	No				Sampli	ng Method:	Blac	lder	j [	Co	ontrol Setting	s
Casing Straight?	Yes	No '*				Dedicat	ted Equip?:	Yes	(No)	1	Purge:		sec.
Grout Seal Intact?	<sup>/</sup> Yes	No	(Not V	isible		Duplicate	Sample?:	Yes	No	1 [	Recover:		sec.
Repairs Necessary:						Duplicate:	Sample ID:	DUD-	-1	1 [	PSI:	00	
Casing	Diameter:		2"					7					N-11-11-11-11-11-11-11-11-11-11-11-11-11
Water Level Bef	fore Purge:		5,36	ft		F	ourge Date:	300C+	18	Time Purgi	ng Began:	0952	am/pm
			~			Well P	urged Dry?	Yes	(No)	Time P	urged Dry:		am/pm
			, ,		,	· Sa	mple Date:	30c+18	·	Time of	Sampling:	1017	am/pm
Depth to To	·		16.92	ft				•					<u> </u>
Water Level Aft	er Sample:		5,977	<u>ft</u>		Bottle	1L Raw	500mL	. Nitric	500mL Nitr	ic (filtered)	250 Su	lfuric
Measuremer	nt Method:	Electric '	Water Level I	Indicator		List:X2				4 - 1L Nitric			
				Field	Measure	ements							
Stabilization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	ļ	Description:		
(3 consecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	1	Color Ode		

Stabili	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	ecutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	0957	10,15	4821	6.65	4.02	-0.3	2,76	15,58	[00	500	clear
2	1002	10,19	4785	6.64	3,82	6.9	2.06	15.58	100	500	U -
3	1007	10.17	4772	6,63	0,66	-11.6	1.92	15.58	100	500	d
4	1012	10,22	4794	6463	0,64	-16,4	2,104	15.58	100	500	Cl.
5	1017	10,29	4833	6.63	0,68	- 18,1	1,93	1558	100	500	Cl -
6		,		J,							
7											
8											
9									· · · · · · · · · · · · · · · · · · ·		
10											

Stabilized: Yes No

Total Volume Removed: 2500 mL



## **Field Datasheet**

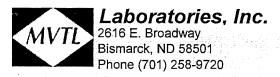
**Groundwater Assessment** 

Company:	MDU Lewis and Clark							
Event:	October 2018							
Sample ID:	117							
Sampling Personal:	DACCED NIDELLE							

Phon	ie: (701) 258-9	0720							Sampling P	ersonal:	() &rren	NIESN	dag	
FIIOIF	e. (701) 256-8					•	•							
<b>Neather Co</b>	onditions:		Temp:	32	°F	Wind:	87	@		Precip:	Sunn	Partly C	loudy / Clou	udv
		Well Info	ormation						Sa	ımplina I	nformatic	/		<b>y</b>
We	Il Locked?	Yes	(NB)				Purgi	ng Method:						
Well	l Labeled?	Xes	No					ng Method:			ſ	Cor	ntrol Settings	
Casing	Straight?	<b>Ves</b>	No				· · · · · · · · · · · · · · · · · · ·	ed Equip?:		₩o-		Purge:	L L	
Grout Se	eal Intact?	Yes	No	Not V	'isible			Sample?:	Yes	No		Recover:	<del>0</del>	sec sec
Repairs Ne	cessary:							Sample ID:					0\$	360
•	Casing	Diameter:		2"				· · · · · · · · · · · · · · · · · · ·	1		l L	1 01.1	<u> </u>	
Wate	r Level Bef	ore Purge:		5,94	ft		F	urge Date:	290CT	8	Time Purgi	ing Began:	1915	am/pn
				l			Well P	urged Dry?	Nes	No		urged Dry:	P C C S	. am/pm
							Sa	mple Date:		-/			0904	am/pm
D	epth to Top	p of Pump:		7.84	ft					***************************************	Retiv		<del></del>	- ampn
Wate	er Level Afte	er Sample:	<	1,44	ft		Bottle		500mL	Nitric	4LA	Per Nia	Life's	
M	easuremer	nt Method:	Electric '	Water Level	Indicator		List:						V10-	
					F: - 1 - 1		,		1	***************************************		······································		
	т	<del></del>		T		Measure			T					
Stabiliz		Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL		Description:		
(3 conse		(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity,	Color, Odo	r, Ect.	
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min			Slightly Turbid,		
1	1920	11,66	8301	6,99	5,70	30,2	22,4	6,68	100	500				

Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond,	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time	,	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1920	11,16	8301	6,99	5,70	30,2	22,4	6,68	100	500	
2	1930	11,20	8305	7,00	5.95	-31,2	913,1	7,01	100	1000,	Cla
3	1945	11,13	8311	7000	603	-2915	41.14	8.08	100	1500	Clan
4	7000	11.32	8161	7,00	5.75	-26,9		Top of	100	1500	den
5			, ,		7			purp			<u> </u>
6	08.59	Pu	Ged )	my fo	~ 5mi	n, befor	e Sompling	6.68		rechargo	***************************************
7	0904	10,12	2424	7.10	7,28	170	8150	7.08	100	500	10 Ca
8	Į.	10-1		ento		, , , , , , , , , , , , , , , , , , ,	ال ۱۰۰۰ ال	7:10	700	3 - 0	
9								N-19F W <sup>2</sup>	*** *****	D.	
10										<i>w</i>	

Total Volume Removed: 5000 mL



# **Chain of Custody Record**

Project Nam	ie:	Event:	Work Order Number:
	MDU Lewis and Clark	October 2018	8d-2900
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):  Darren Nieswang
	Sample Info	mation	Bottle Type Field Parameters Analysis

	Sample	<u>e Informatio</u>	n		E	ottle Ty	pe	Fi	eld Para	meters	Analysis
Lab Number	Sample ID	late.	Time	Sample Type	liter Nitric			emp (°C)	pec. Cond.		
	Saitible ID		/· /-	( S	 1-1-1			<i> </i>	\ \docume{\gamma}	H	Analysis Required
W3933	MW120	300ct18	10-17	GW	4			10,29	4833	6,63	
W3934	nw 117	300c+18	0904	GW	4			10,02	8424	1710	Rad 226 and 228
WJ935	Jup-1	30 Oct 18	1017	GW	4			_		-	

Sarat American	Relinquished By:		Sai	mple Condition:
	Name:	Date/Time	Location:	Temp (°C)
1 Par	Nin	300+9	Log In Walk In #2>	ROJ (18 TM562/TM808
2				

ed by:
Date/Time
31 (42018
0300