



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 13  
Sampling Personal: Jerry Payer

Weather Conditions: Temp: 40 °F Wind: NE-10 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

### Well Information

Well Locked?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Well Labeled?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Casing Straight?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Grout Seal Intact?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>28.76</u>	ft
Total Well Depth:	<u>          </u> ft	
Well Volume:	<u>          </u> liters	
Depth to Top of Pump:	<u>          </u> ft	
Water Level After Sample:	<u>29.23</u>	ft
Measurement Method:	<u>Electric Water Level Indicator</u>	

### Sampling Information

Purging Method:	<u>Bladder</u>	Control Settings	
Sampling Method:	<u>Bladder</u>	Purge:	<u>5</u> sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Recover:	<u>55</u> sec.
Duplicate Sample?:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	PSI:	<u>20</u>
Duplicate Sample ID:	<u>Dup 1</u>	Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>19 Apr 17</u>	Time Purging Began:	<u>0805</u> <u>am</u> /pm
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry:	<u>          </u> am/pm
Sample Date:	<u>19 Apr 17</u>	Time of Sampling:	<u>0855</u> <u>am</u> /pm
Bottle List:	<u>CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric</u>		

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
1	0810	7.70	10365	6.95	4.01	218.5	3.89	29.15	500.0	Clear
2	0815	7.78	10353	6.95	3.90	220.2	3.96	29.20	500.0	Clear
3	0820	7.77	10357	6.95	3.94	220.9	1.90	29.27	500.0	Clear
4	0825	7.81	10345	6.95	3.96	221.4	2.23	29.30	500.0	Clear
5	0830	7.89	10355	6.96	4.06	204.0	10.0	29.25	500.0	Clear
6	0835	7.91	10374	6.96	4.22	159.9	11.9	29.24	500.0	Clear
7	0840	7.91	10395	6.96	4.30	98.7	12.4	29.25	500.0	Clear
8	0845	7.97	10412	6.96	4.25	77.8	9.36	29.24	500.0	Clear
9	0850	8.03	10424	6.96	4.26	69.4	9.52	29.25	500.0	Clear
10	0855	8.01	10457	6.96	4.35	62.1	9.74	29.24	500.0	Clear

Stabilized:  Yes  No

Total Volume Removed: 5000.0 mL

Comments:



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# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 101  
Sampling Personal: Jerry Mayon

Weather Conditions: Temp: 45 °F Wind: S @ S-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	36.54		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	40.32		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	8 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	No	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	25
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	1422	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	19 Apr 17	Time of Sampling:	1503	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
SEQ #	Time									
1	1427	9.00	4766	6.80	4.46	69.7	8.48	37.35	500.0	Clear
2	1437	8.90	4751	6.76	1.26	11.7	8.65	38.25	1000.0	Clear
3	1447	8.91	4739	6.75	1.06	7.6	9.00	39.08	1000.0	Clear
4	1453	9.02	4736	6.75	1.06	11.8	8.30	39.15	500.0	Clear
5	1458	8.96	4734	6.75	1.02	16.0	7.92	39.20	500.0	Clear
6	1503	8.97	4733	6.74	1.07	19.6	7.81	39.25	500.0	Clear
7										
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 4000.0 mL



2616 E. Broadway Ave, Bismarck, ND  
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# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 102  
Sampling Personal: Jerry Skye

Weather Conditions: Temp: 45 °F Wind: S @ 5-10 Precip: Sunny (Partly Cloudy / Cloudy)

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	15.48		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	18.15		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	No	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	15
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	1053	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	19 Apr 17	Time of Sampling:	1138	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
1	1058	8.18	8031	6.80	1.83	46.6	17.9	16.35	500.0	Clear
2	1108	8.19	7563	6.78	0.96	32.4	2.70	16.78	1000.0	Clear
3	<del>1108</del> 1113	8.16	7268	6.79	0.98	30.5	1.29	16.92	500.0	Clear
4	1118	8.19	7220	6.79	0.97	27.7	1.05	17.08	500.0	Clear
5	1123	8.29	7129	6.80	0.95	21.1	0.71	17.20	500.0	Clear
6	1128	8.27	7001	6.81	1.36	17.1	0.52	17.25	500.0	Clear
7	1123	8.33	6774	6.84	1.45	13.0	0.52	17.31	500.0	Clear
8	1128	8.27	6775	6.86	1.70	10.4	0.33	17.40	50.0	Clear
9	<del>1123</del>	8.18	6774	6.87	1.76	7.7	0.32	17.50	500.0	Clear
10	1138	8.07	6813	6.88	1.8	4.5	0.36	17.52	500.0	Clear

Stabilized:  Yes  No

Total Volume Removed: 5500.0 mL

Comments:



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# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 103  
Sampling Personal: *Jerry Flynn*

Weather Conditions: Temp: 45 °F Wind: N05-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	31.52		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	33.00		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	20
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	1615	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	19 Apr 17	Time of Sampling:	1635	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ #	Time									clear, slightly turbid, turbid
1	1620	8.49	4976	6.72	2.44	106.2	1.29	31.62	500.0	Clear
2	1625	8.44	4990	6.73	2.51	114.2	1.86	31.65	500.0	Clear
3	1630	8.41	4996	6.73	2.41	123.0	1.56	31.72	500.0	Clear
4	1635	8.46	4993	6.73	2.38	128.8	1.48	31.82	500.0	Clear
5										
6										
7										
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 2000.0 mL



2616 E. Broadway Ave, Bismarck, ND  
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# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 70  
Sampling Personal: Jeremy Meyer

Weather Conditions: Temp: 45 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

### Well Information

Well Locked?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	19.22 ft		
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	— ft		
Water Level After Sample:	20.85 ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Recover:	55 sec.
Duplicate Sample?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	PSI:	20
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	1258	am/pm
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Time Purged Dry:	— am/pm
Sample Date:	19 Apr 17	Time of Sampling:	1323	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
SEQ #	Time									
1	1303	8.57	4270	7.03	1.33	92.0	0.20	19.83	500.0	Clear
2	1308	8.61	4302	7.02	0.82	93.0	0.23	20.05	500.0	Clear
3	1313	8.56	4312	7.02	0.79	93.4	0.87	20.19	500.0	Clear
4	1318	8.58	4314	7.02	0.73	94.6	0.84	20.30	500.0	Clear
5	1323	8.60	4313	7.02	0.73	95.7	0.79	20.40	500.0	Clear
6										
7										
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 2500.0 mL



**Laboratories, Inc.**  
 2616 E. Broadway  
 Bismarck, ND 58501  
 Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-0987
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Jerry Meyer

Lab Number	Sample ID	Date	Time	Sample Type	Bottle Type			Field Parameters			Analysis Required
					1 liter	500mL Nitric	500mL Nitric (filtered)	Temp (°C)	Spec. Cond.	pH	
W1095	FBI	19 Apr 17	-	GW	X	X	X	-	-	-	MDU CCR List with TSS and Dissolved CCR Metals.
W1096	Dup 1	19 Apr 17	-	GW	X	X	X	-	-	-	
W1097	13	19 Apr 17	0855	GW	X	X	X	8.01	10457	6.96	
W1098	101	19 Apr 17	1503	GW	X	X	X	8.97	4733	6.74	
W1099	102	19 Apr 17	1138	GW	X	X	X	8.07	6813	6.88	
W1100	103	19 Apr 17	1635	GW	X	X	X	8.46	4993	6.73	
W1101	70	19 Apr 17	1323	GW	X	X	X	8.60	4313	7.02	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
	21 Apr 17 0740	Log In Walk In #2	1.5 TM562 / TM588
1			
2			

Received by:	
Name:	Date/Time
	21 April 17 900



CASE NARRATIVE- AMENDED 6 JUL 17 (Work Order)

MVTL Lab Reference No/SDG: 201782-0988
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR April 2017
MVTL Laboratory Identifications: 17-W1102 through 17-W1109
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include FB2, Dup2, 2-90, 3-90, 33, 44R, 80R, and 105.

I. RECEIPT

- All samples were received at the laboratory on 21 Apr17 at 930.
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.
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.
Due to a laboratory accident, sample 2-90 was unable to be analyzed. The sample will be recollected at another time and reported under separate cover.

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.
Methods 6010D and Method 6020B were used to analyze the metals.



CASE NARRATIVE- AMENDED 6 JUL 17 (Work Order)

MVTL Lab Reference No/SDG: 201782-0988  
Client: Montana Dakota Utilities  
Location: MDU Heskett  
Project Identification: CCR April 2017  
MVTL Laboratory Identifications: 17-W1102 through 17-W1109  
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.
  - 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.
  - The recoveries for one fluoride 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.
  - Recoveries for two lithium matrix spike duplicates were outside of the acceptable limits. Recoveries of the matrix spikes were acceptable. RPDs for the recoveries of the matrix spikes/matrix spike duplicates were acceptable. No further action was taken.

V. REPORTING

- On 6 Jul 17, it was discovered that the template used to create the case narrative had an extra 7 in the work order (e.g. 2017782-0988). Case narrative has been corrected to reflect the correct work order.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7 JUL 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager

**Quality Control Report**

Lab IDs: 17-W1102 to 17-W1109

Project: MDU Heskett - CCR

Work Order: 201782-0988

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 - Total mg/l	0.1000	109	80-120	0.400	17W1096q	< 0.001	0.4490	112	75-125	0.4490	0.4302	108	4.3	20	-	-	< 0.001
	0.1000	108	80-120	0.400	17W1107q	< 0.001	0.4302	108	75-125	0.4302	0.4374	109	1.7	20	-	-	< 0.001
				0.400	17W1146q	< 0.001	0.4444	111	75-125	0.4444	0.4196	105	5.7	20	-	-	
Arsenic - Total mg/l	0.1000	109	80-120	0.400	17W1096q	< 0.005	0.4588	115	75-125	0.4588	0.4370	109	4.9	20	-	-	< 0.002
	0.1000	106	80-120	0.400	17W1107q	< 0.005	0.4364	109	75-125	0.4364	0.4518	113	3.5	20	-	-	< 0.002
				0.400	17W1146q	< 0.005	0.4526	113	75-125	0.4526	0.4200	105	7.5	20	-	-	
Barium - Total mg/l	0.1000	103	80-120	0.400	17W1096q	0.0140	0.3866	93	75-125	0.3866	0.3974	96	2.8	20	-	-	< 0.002
	0.1000	104	80-120	0.400	17W1107q	0.0158	0.4114	99	75-125	0.4114	0.4080	98	0.8	20	-	-	< 0.002
				0.400	17W1146q	0.0089	0.3982	97	75-125	0.3982	0.3672	90	8.1	20	-	-	
Beryllium - Total mg/l	0.1000	108	80-120	0.400	17W1096q	< 0.001	0.4430	111	75-125	0.4430	0.4270	107	3.7	20	-	-	< 0.0005
	0.1000	109	80-120	0.400	17W1107q	< 0.001	0.4296	107	75-125	0.4296	0.4240	106	1.3	20	-	-	< 0.0005
				0.400	17W1146q	< 0.001	0.4274	107	75-125	0.4274	0.4084	102	4.5	20	-	-	
Boron - Total mg/l	0.40	100	80-120	0.400	17-W1107	0.39	0.75	90	75-125	0.75	0.76	92	1.3	20	-	-	< 0.1
				1.50	17-W1146	0.81	2.32	101	75-125	2.32	2.37	104	2.1	20	-	-	< 0.1
Cadmium - Total mg/l	0.1000	111	80-120	0.400	17W1096q	< 0.0005	0.4554	114	75-125	0.4554	0.4380	110	3.9	20	-	-	< 0.0005
	0.1000	111	80-120	0.400	17W1107q	< 0.0005	0.4368	109	75-125	0.4368	0.4370	109	0.0	20	-	-	< 0.0005
				0.400	17W1146q	< 0.0005	0.4354	109	75-125	0.4354	0.4166	104	4.4	20	-	-	
Calcium - Total mg/l	20.0	104	80-120	500	17W1101q	417	870	91	75-125	870	895	96	2.8	20	-	-	< 1
	20.0	106	80-120	1000	17W1146q	444	1430	99	75-125	1430	1390	95	2.8	20	-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	107	80-120	30.0	17-W1098	19.1	50.8	106	80-120	50.8	48.3	97	5.0	20	-	-	< 1
	30.0	87	80-120												-	-	< 1
Chromium - Total mg/l	0.1000	107	80-120	0.400	17W1096q	0.0044	0.4312	107	75-125	0.4312	0.4124	102	4.5	20	-	-	< 0.002
	0.1000	105	80-120	0.400	17W1107q	< 0.002	0.4082	102	75-125	0.4082	0.4122	103	1.0	20	-	-	< 0.002
				0.400	17W1146q	< 0.002	0.4200	105	75-125	0.4200	0.3914	98	7.0	20	-	-	
Cobalt - Total mg/l	0.1000	104	80-120	0.400	17W1096q	< 0.002	0.4134	103	75-125	0.4134	0.3992	100	3.5	20	-	-	< 0.002
	0.1000	104	80-120	0.400	17W1107q	< 0.002	0.3972	99	75-125	0.3972	0.4022	101	1.3	20	-	-	< 0.002
				0.400	17W1146q	0.0023	0.4134	103	75-125	0.4134	0.3928	98	5.1	20	-	-	



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724  
1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
www.mvttl.com

MEMBER  
ACIL

## Quality Control Report

Lab IDs: 17-W1102 to 17-W1109

Project: MDU Heskett - CCR

Work Order: 201782-0988

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	108	90-110	0.500	17-W1084	2.09	2.55	92	80-120	2.55	2.55	92	0.0	20	-	-	< 0.1
	0.50	108	90-110	0.500	17-W1106	0.25	0.72	94	80-120	0.72	0.72	94	0.0	20	-	-	< 0.1
	0.50	106	90-110	0.500	17-W1146	0.59	0.95	72	80-120	0.95	0.95	72	0.0	20	-	-	< 0.1
				1.00	17-D1256	4.34	5.48	114	80-120	5.48	5.44	110	0.7	20	-	-	< 0.1
Lead - Total mg/l	0.1000	105	80-120	0.400	17W1096q	< 0.001	0.4026	101	75-125	0.4026	0.3852	96	4.4	20	-	-	< 0.0005
	0.1000	104	80-120	0.400	17W1107q	< 0.001	0.3982	100	75-125	0.3982	0.3910	98	1.8	20	-	-	< 0.0005
				0.400	17W1146q	< 0.001	0.3890	97	75-125	0.3890	0.3696	92	5.1	20	-	-	< 0.0005
Lithium - Total mg/l	0.40	105	80-120	0.400	17-W1107	1.55	2.03	120	75-125	2.03	2.09	135	2.9	20	-	-	< 0.1
				1.00	17-W1146	2.06	3.18	112	75-125	3.18	3.32	126	4.3	20	-	-	< 0.1
Mercury - Total mg/l	0.0020	105	85-115	0.002	17-W1102	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	< 0.0002
	0.0020	110	85-115	0.002	AA14480	< 0.0002	0.0020	100	70-130	0.0020	0.0021	105	4.9	20	-	-	< 0.0002
				0.002	17-W1146	< 0.0002	0.0020	100	70-130	0.0020	0.0021	105	4.9	20	-	-	< 0.0002
Molybdenum - Total mg/l	0.1000	102	80-120	0.400	17W1096q	< 0.002	0.4594	115	75-125	0.4594	0.4396	110	4.4	20	-	-	< 0.002
	0.1000	102	80-120	0.400	17W1107q	< 0.002	0.4468	112	75-125	0.4468	0.4468	112	0.0	20	-	-	< 0.002
				0.400	17-W1146	0.0041	0.4422	110	75-125	0.4422	0.4172	103	5.8	20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	8.4	8.5	-	1.2	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.2	7.3	-	1.4	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.0	7.1	-	1.4	20	-	-	-
	-	-	-	-	-	-	-	-	-	6.8	7.8	-	13.7	20	-	-	-
Selenium - Total mg/l	0.1000	108	80-120	0.400	17W1096q	0.1528	0.6106	114	75-125	0.6106	0.6232	118	2.0	20	-	-	< 0.002
	0.1000	96	80-120	0.400	17W1107q	0.1538	0.6054	113	75-125	0.6054	0.6084	114	0.5	20	-	-	< 0.002
				0.400	17-W1146	0.1264	0.5276	100	75-125	0.5276	0.5478	105	3.8	20	-	-	< 0.002
Sulfate mg/l	100	110	80-120	100	17-W1102	< 5	111	111	80-120	111	107	107	3.7	20	-	-	< 5
Thallium - Total mg/l	0.1000	105	80-120	0.400	17W1096q	< 0.0005	0.4022	101	75-125	0.4022	0.3820	96	5.2	20	-	-	< 0.0005
	0.1000	104	80-120	0.400	17W1107q	< 0.0005	0.3928	98	75-125	0.3928	0.3880	97	1.2	20	-	-	< 0.0005
				0.400	17W1146q	< 0.0005	0.3904	98	75-125	0.3904	0.3716	93	4.9	20	-	-	< 0.0005
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1210	1190	-	1.7	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	3720	3730	-	0.3	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	6780	6840	-	0.9	20	-	-	< 10

Approved by: C. Campbell  
15 May 17



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Page: 1 of 7

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1102  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: FB2

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH	* 6.0	units	0.1	SM4500 H+ B	21 Apr 17 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	24 Apr 17 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	25 Apr 17 13:54	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	< 1	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 11:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Selenium - Total	< 0.01 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*cc  
15 May 17*

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

CERTIFICATION: ND # ND-00016



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Page: 2 of 7

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1103  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: Dup 2

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH	* 7.3	units	0.1	SM4500 H+ B	21 Apr 17 17:00	SVS
Fluoride	0.14	mg/l	0.10	SM4500-F-C	24 Apr 17 17:00	SVS
Sulfate	2710	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	40.6	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	4380	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	498	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Lithium - Total	0.25	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.11	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 11:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Barium - Total	0.0117	mg/l	0.0020	6020	10 May 17 11:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD
Chromium - Total	0.0020	mg/l	0.0020	6020	10 May 17 11:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Molybdenum - Total	0.0034	mg/l	0.0020	6020	10 May 17 11:45	KMD
Selenium - Total	0.2126	mg/l	0.0020	6020	10 May 17 11:45	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD

\* Holding time exceeded

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

Approved by:

*CC*  
*Claudette K. Carroll* *15 May 17*

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

CERTIFICATION: ND # ND-00016





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Page: 4 of 7

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1106  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17 12:40  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 33

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH - Field	6.59	units	NA	SM 4500 H+ B	20 Apr 17 12:40	JSM
pH	* 6.8	units	0.1	SM4500 H+ B	21 Apr 17 17:00	SVS
Temperature - Field	8.76	Degrees C	NA	SM 2550B	20 Apr 17 12:40	JSM
Conductivity - Field	4998	umhos/cm	1	EPA 120.1	20 Apr 17 12:40	JSM
Fluoride	0.25	mg/l	0.10	SM4500-F-C	24 Apr 17 17:00	SVS
Sulfate	3160	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	14.1	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	4770	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	492	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Lithium - Total	0.79	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.30	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 11:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Barium - Total	0.0141	mg/l	0.0020	6020	10 May 17 11:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD
Chromium - Total	0.0043	mg/l	0.0020	6020	10 May 17 11:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Selenium - Total	< 0.01 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*CC*  
*15 May 17*

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

CERTIFICATION: ND # ND-00016



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Page: 5 of 7

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1107  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17 7:43  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 44R

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH - Field	6.60	units	NA	SM 4500 H+ B	20 Apr 17 7:43	JSM
pH	* 7.0	units	0.1	SM4500 H+ B	21 Apr 17 18:00	SVS
Temperature - Field	7.93	Degrees C	NA	SM 2550B	20 Apr 17 7:43	JSM
Conductivity - Field	9045	umhos/cm	1	EPA 120.1	20 Apr 17 7:43	JSM
Fluoride	0.73	mg/l	0.10	SM4500-F-C	24 Apr 17 17:00	SVS
Sulfate	5600	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	259	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	8960	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	435	mg/l	1.0	6010	24 Apr 17 11:34	SZ
Lithium - Total	1.55	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.39	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 11:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Barium - Total	0.0158	mg/l	0.0020	6020	10 May 17 11:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Selenium - Total	0.1538	mg/l	0.0020	6020	10 May 17 11:45	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD

\* Holding time exceeded

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

Approved by: Claudette K. Carroll <sup>CC</sup> 15 May 17

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

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 6 of 7

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1108  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17 10:55  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 80R

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH - Field	7.12	units	NA	SM 4500 H+ B	20 Apr 17 10:55	JSM
pH	* 7.6	units	0.1	SM4500 H+ B	21 Apr 17 18:00	SVS
Temperature - Field	7.48	Degrees C	NA	SM 2550B	20 Apr 17 10:55	JSM
Conductivity - Field	5747	umhos/cm	1	EPA 120.1	20 Apr 17 10:55	JSM
Fluoride	0.33	mg/l	0.10	SM4500-F-C	24 Apr 17 18:00	SVS
Sulfate	3020	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	160	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	5340	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	291	mg/l	1.0	6010	24 Apr 17 11:34	SZ
Lithium - Total	0.93	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.27	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 11:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 11:45	KMD
Barium - Total	0.0102	mg/l	0.0020	6020	10 May 17 11:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 11:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 11:45	KMD
Molybdenum - Total	0.0035	mg/l	0.0020	6020	10 May 17 11:45	KMD
Selenium - Total	0.0601	mg/l	0.0020	6020	10 May 17 11:45	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 11:45	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 15 May 17

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

CERTIFICATION: ND # ND-00016



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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
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## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 11 May 17  
Lab Number: 17-W1109  
Work Order #: 82-0988  
Account #: 002800  
Date Sampled: 20 Apr 17 9:25  
Date Received: 21 Apr 17 9:30  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 105

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH - Field	6.75	units	NA	SM 4500 H+ B	20 Apr 17 9:25	JSM
pH	* 7.2	units	0.1	SM4500 H+ B	21 Apr 17 18:00	SVS
Temperature - Field	7.36	Degrees C	NA	SM 2550B	20 Apr 17 9:25	JSM
Conductivity - Field	7168	umhos/cm	1	EPA 120.1	20 Apr 17 9:25	JSM
Fluoride	0.28	mg/l	0.10	SM4500-F-C	24 Apr 17 18:00	SVS
Sulfate	4090	mg/l	5.00	ASTM D516-07	28 Apr 17 16:06	EMS
Chloride	354	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	6780	mg/l	10	I1750-85	21 Apr 17 15:35	SVS
Calcium - Total	392	mg/l	1.0	6010	24 Apr 17 11:34	SZ
Lithium - Total	1.10	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.32	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 12:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 12:45	KMD
Barium - Total	0.0222	mg/l	0.0020	6020	10 May 17 12:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	11 May 17 14:42	KMD
Selenium - Total	< 0.002	mg/l	0.0020	6020	11 May 17 8:40	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*CC*  
*15 May 17*

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

CERTIFICATION: ND # ND-00016



# 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



Page: 1 of 7

## CERTIFICATE of ANALYSIS - STATE

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1102  
 Work Order #: 82-0988  
 Account #: 002800  
 Date Sampled: 20 Apr 17  
 Date Received: 21 Apr 17 9:30  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: FB2

Temp at Receipt: 1.0C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
Total Suspended Solids	< 2	mg/l	2	I3765-85	21 Apr 17 15:15	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	21 Apr 17 17:00	SVS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:57	EV
Magnesium - Total	< 1	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Sodium - Total	< 1	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Potassium - Total	< 1	mg/l	1.0	6010	24 Apr 17 13:45	SZ
Calcium - Dissolved	< 1	mg/l	1.0	6010	24 Apr 17 14:34	SZ
Magnesium - Dissolved	< 1	mg/l	1.0	6010	24 Apr 17 14:34	SZ
Sodium - Dissolved	< 1	mg/l	1.0	6010	24 Apr 17 14:34	SZ
Potassium - Dissolved	< 1	mg/l	1.0	6010	24 Apr 17 14:34	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	25 Apr 17 16:24	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	24 Apr 17 18:00	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 May 17 12:45	KMD
Arsenic - Dissolved	< 0.005 ^	mg/l	0.0020	6020	10 May 17 12:45	KMD
Barium - Dissolved	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Beryllium - Dissolved	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Lead - Dissolved	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020	11 May 17 14:42	KMD
Selenium - Dissolved	< 0.002	mg/l	0.0020	6020	11 May 17 8:40	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* <sup>cc</sup> *15 May 17*

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

CERTIFICATION: ND # ND-00016



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
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www.mvttl.com



May 5, 2017

Montana Dakota Utilities  
Attn: Samantha Marshall  
400 N. 4<sup>th</sup> St.  
Bismarck, ND 58501

RE: Groundwater Sampling Event - MDU Heskett Ash Site

Dear Ms. Marshall:

From April 19-21, 2017, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule.

All wells were located and were found to be in generally good condition. The wells for CCR were purged and sampled using a dedicated bladder pump and BARR's SOP for low flow purging and sampling. We were able to collect a sample from well 104 during this event. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis. The field data report for the sampling event accompanies this letter.

Due to a shipping error, well 2-90 was purged again and sampled on April 26, 2017.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer  
MVTL Field Services



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Heskett**  
GROUNDWATER SAMPLING

Attn: Samantha Marshall  
400 N. 4th St  
Bismarck, ND 58501  
701-222-7829

WO#	CCR	RadChem
	82-0988	82-0999
	82-0987	82-0998
	82-0994	82-0997
	82-1038	82-1039

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	WATER LEVEL END	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	pH	Turbidity NTU	SAMPLE APPEARANCE OR COMMENT
2-90*	26-Apr-17	11:40	26-Apr-17	12:00	1686.60	1666.24	20.36	na	2000.0	Bladder	7.91	7790	6.91	0.18	clear
3-90	20-Apr-17	13:40	20-Apr-17	14:05	1686.01	1668.71	17.30	17.42	2500.0	Bladder	8.07	4851	6.89	0.77	clear
13	19-Apr-17	8:05	19-Apr-17	8:55	1724.98	1696.22	28.76	29.23	5000.0	Bladder	8.01	10457	6.96	9.74	clear
33	20-Apr-17	12:00	20-Apr-17	12:40	1717.91	1676.61	41.30	41.51	4000.0	Bladder	8.76	4998	6.59	1.52	clear
70	19-Apr-17	12:58	19-Apr-17	13:23	1706.36	1687.14	19.22	20.85	2500.0	Bladder	8.60	4313	7.02	0.79	clear
80R	20-Apr-17	10:15	20-Apr-17	10:55	NA	NA	14.24	14.52	4000.0	Bladder	7.48	5747	7.12	0.88	clear
44R	20-Apr-17	6:53	20-Apr-17	7:43	NA	NA	25.05	25.11	5000.0	Bladder	7.93	9045	6.60	6.21	clear
101	19-Apr-17	14:22	19-Apr-17	15:03	NA	NA	36.54	40.32	4000.0	Bladder	8.97	4733	6.74	7.81	clear
102	19-Apr-17	10:53	19-Apr-17	11:38	NA	NA	15.48	18.15	5500.0	Bladder	8.07	6813	6.88	0.36	clear
103	19-Apr-17	16:15	19-Apr-17	16:35	NA	NA	31.52	33.00	2000.0	Bladder	8.46	4993	6.73	1.48	clear
104	21-Apr-17	8:30	21-Apr-17	9:15	NA	NA	13.21	22.20	4500.00	Bladder	8.14	13821.00	7.00	2.31	clear
105	20-Apr-17	8:45	20-Apr-17	9:25	NA	NA	12.24	12.58	4000.0	Bladder	7.36	7168	6.75	4.17	clear
1-90	NA	NA	20-Apr-17	16:28	1675.86	1666.37	9.49	NA	NA	NA	NA	NA	NA	NA	water level only

\*well 2-90 had to be resampled on April 26, 2017 due to a shipping error.





2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett

Event: 2017

Sample ID: 3-90

Sampling Personal: Jerry Heskett

Weather Conditions: Temp: 45 °F Wind: N 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	17.30	ft	
Total Well Depth:	—	ft	
Well Volume:	—	liters	
Depth to Top of Pump:	—	ft	
Water Level After Sample:	17.42	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	No	Recover:	55 sec.
Duplicate Sample?:	<input checked="" type="radio"/> Yes	No	PSI:	10
Duplicate Sample ID:	Dup 2		Pumping Rate:	100 mL/min
Purge Date:	20 Apr 17	Time Purging Began:	1340	am/pm
Well Purged Dry?:	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	20 Apr 17	Time of Sampling:	1405	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
1	1345	8.33	4868	6.90	2.58	-45.6	2.26	17.37	500.0	Clear
2	1350	8.23	4854	6.90	2.38	-49.2	1.59	17.48	500.0	Clear
3	1355	8.12	4852	6.89	2.21	-47.4	0.83	17.52	500.0	Clear
4	1400	8.11	4854	6.89	2.16	-43.6	0.79	17.48	500.0	Clear
5	1405	8.07	4851	6.89	2.17	-41.3	0.77	17.40	500.0	Clear
6										
7										
8										
9										
10										

Stabilized:  Yes  No

Total Volume Removed: 2500.0 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett  
 Event: 2017  
 Sample ID: 33  
 Sampling Personal: Jerry Rhy

Weather Conditions: Temp: 45 °F Wind: N05-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<u>No</u>	
Well Labeled?	<u>Yes</u>	No	
Casing Straight?	<u>Yes</u>	No	
Grout Seal Intact?	Yes	No	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>41.30</u>		ft
Total Well Depth:	<u>—</u>		ft
Well Volume:	<u>—</u>		liters
Depth to Top of Pump:	<u>—</u>		ft
Water Level After Sample:	<u>41.51</u>		ft
Measurement Method:	<u>Electric Water Level Indicator</u>		

### Sampling Information

Purging Method:	<u>Bladder</u>		Control Settings	
Sampling Method:	<u>Bladder</u>		Purge:	<u>5</u> sec.
Dedicated Equip?:	<u>Yes</u>	No	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	<u>20</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>20 Apr 17</u>	Time Purging Began:	<u>1200</u>	<u>am/pm</u>
Well Purged Dry?	Yes	<u>No</u>	Time Purged Dry:	<u>—</u> <u>am/pm</u>
Sample Date:	<u>20 Apr 17</u>	Time of Sampling:	<u>1240</u>	<u>am/pm</u>
Bottle List:	<u>CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric</u>			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
										SEQ #
1	1205	8.73	5322	6.64	1.18	-20.2	5.59	41.50	500.0	Clear
2	1215	8.77	5078	6.61	1.45	4.8	6.20	41.47	1000.0	Clear
3	1225	8.76	5005	6.59	1.61	11.6	2.13	41.56	1000.0	Clear
4	1230	8.71	4999	6.59	1.66	4.0	1.61	41.52	500.0	Clear
5	1235	8.72	4998	6.59	1.64	-6.0	1.56	41.53	500.0	Clear
6	1240	8.76	4998	6.59	1.63	-11.3	1.52	41.54	500.0	Clear
7										
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 4000.0 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 44R  
Sampling Personal: Jay

Weather Conditions: Temp: 40 °F Wind: N05-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	25.05	ft
Total Well Depth:	—	
Well Volume:	—	
Depth to Top of Pump:	—	
Water Level After Sample:	25.11	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		PSI:	20
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	20 Apr 17	Time Purging Began:	0653	am/pm
Well Purged Dry?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry:	—	am/pm
Sample Date:	20 Apr 17	Time of Sampling:	0743	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Description: Clarity, Color, Odor, Ect.	
1	0658	7.73	9029	6.62	3.50	264.6	62.3	25.11	500.0	clear
2	0718	7.76	9043	6.60	2.50	249.4	9.44	25.18	2000.0	clear
3	0728	7.82	9049	6.60	2.45	245.0	7.59	25.15	1000.0	clear
4	0733	7.82	9040	6.60	2.43	242.4	6.35	25.19	500.0	clear
5	0738	7.89	9044	6.60	2.31	240.7	6.64	25.10	500	clear
6	0743	7.93	9045	6.60	2.36	239.0	6.21	25.08	500.0	clear
7										
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 5000.0 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 80 R  
Sampling Personal: Jeremy Hoyer

Weather Conditions: Temp: 45 °F Wind: N 05 20 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	14.24		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	14.52		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	15
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	20 Apr 17	Time Purging Began:	1015	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	20 Apr 17	Time of Sampling:	1055	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1020	7.50	5749	7.13	3.18	179.0	0.35	14.40	500.0	Clear
2	1025	7.42	5736	7.13	1.20	179.7	0.41	14.48	500.0	Clear
3	1030	7.47	5739	7.12	0.95	179.9	0.42	14.55	500.0	Clear
4	1035	7.44	5738	7.13	0.87	169.9	0.48	14.58	500.0	Clear
5	1040	7.38	5742	7.12	0.84	143.8	1.13	14.56	500.0	Clear
6	1045	7.38	5741	7.12	0.77	122.3	0.79	14.57	500.0	Clear
7	1050	7.45	5743	7.12	0.74	116.5	0.84	14.59	500.0	Clear
8	1055	7.48	5742	7.12	0.74	111.3	0.88	14.57	500.0	Clear
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 4000.0 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett

Event: 2017

Sample ID: 105

Sampling Personal: Jerry Heskett

Weather Conditions: Temp: 45 °F Wind: NWS-10 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	12.24		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	2 12.58		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 5 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes No	Recover: 55 sec.
Duplicate Sample?:	Yes <input checked="" type="radio"/> No	PSI: 10
Duplicate Sample ID:	—	Pumping Rate: 100 mL/min
Purge Date:	20 Apr 17	Time Purging Began: 0845 am/pm
Well Purged Dry?	Yes <input checked="" type="radio"/> No	Time Purged Dry: — am/pm
Sample Date:	20 Apr 17	Time of Sampling: 0925 am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
1	0850	6.99	6334	6.79	0.99	192.6	9.54	12.58	500.0	Clear
2	0900	7.24	6245	6.78	0.69	175.7	3.71	12.55	1000.0	Clear
3	0905	7.27	6556	6.77	0.68	172.8	4.23	12.56	500.0	Clear
4	0910	7.35	6775	6.76	0.67	171.0	4.53	12.58	500.0	Clear
5	0915	7.28	6932	6.76	0.68	170.2	4.37	12.55	500.0	Clear
6	0920	7.32	7076	6.75	0.68	169.7	4.16	12.57	500.0	Clear
7	0925	7.36	7168	6.75	0.68	169.3	4.17	12.56	500.0	Clear
8	0930									
9										
10										

Stabilized:  Yes No

Total Volume Removed: 4100.0 mL

Comments:

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Jerry P. Ryan

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	19 Apr 17		Time:	0650		
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	19.47	6.97	7.00	6.95-7.05	-22.6	0 +/- 50
Buffer 10	19.73	9.89	10.00	9.95-10.05	-196.5	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	19.11	10,225	10,003	±10%	Buffer 5000	5002
<b>ORP</b>						
231 mV @ 25C	7.95	241.5	250.5	±10 mV		
<b>DO</b>						
	10.00	104.8%	94.2%		Barometric Pressure (mm Hg)	
				mg/L	716.11	

Post Site Check		
Time:	1640	
<b>pH</b>	Temp °C	Reading
Buffer 7	15.31	7.02
<b>Conductivity</b>		
Buffer 5000	16.38	5009

Pre Site Calibration						
Date:	20 Apr 17		Time:	0650		
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	8.72	7.02	7.00	6.95-7.05	-23.9	0 +/- 50
Buffer 10	9.01	10.05	10.00	9.95-10.05	-198.7	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	9.31	10,134	10,008	±10%	Buffer 5000	4998
<b>ORP</b>						
231 mV @ 25C	8.37	258.0	250.5	±10 mV		
<b>DO</b>						
	7.52	111.0%	94.3%		Barometric Pressure (mm Hg)	
				mg/L	716.34	

Post Site Check		
Time:	1630	
<b>pH</b>	Temp °C	Reading
Buffer 7	20.53	7.00
<b>Conductivity</b>		
Buffer 5000	20.00	4989





# Laboratories, Inc.

2616 E. Broadway  
Bismarck, ND 58501  
Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-0988
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Jery Elyer Darrin Nieswazy

Lab Number	Sample ID	Date	Time	Sample Type	Bottle Type			Field Parameters			Analysis Required
					1 liter	500mL Nitric	500mL Nitric (filtered)	Temp (°C)	Spec. Cond.	pH	
W1102	FB2	20 Apr 17	—	GW	X	X	X	—	—	—	*  MDU CCR List with TSS and Dissolved CCR Metals.
W1103	Dep 2	20 Apr 17	—	GW	X	X	X	—	—	—	
<del>W1104</del>	<del>2-90</del>	<del>20 Apr 17</del>	<del>1525</del>	<del>GW</del>	<del>X</del>	<del>X</del>	<del>X</del>	<del>8.66</del>	<del>7497</del>	<del>6.90</del>	
W1105	3-90	20 Apr 17	1405	GW	X	X	X	8.07	4851	6.89	
W1106	33	20 Apr 17	1240	GW	X	X	X	8.76	4998	6.59	
W1107	44R	20 Apr 17	0743	GW	X	X	X	7.93	9045	6.60	
W1108	80R	20 Apr 17	1055	GW	X	X	X	7.48	5747	7.12	
W1109	105	20 Apr 17	0925	GW	X	X	X	7.36	7168	6.75	

Comments:

\* Lab accident. Sample will be re-collected at a later date.  
CC 29 April 17

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
	21 Apr 17 0740	Log In Walk In #2	Rot 1.0 TM562 / TM588

Received by:	
Name:	Date/Time
	21 April 17 9:30



CASE NARRATIVE – AMENDED 6 JUL 17 (Work Order)

MVTL Lab Reference No/SDG: 2017782-0994
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR April 2017
MVTL Laboratory Identifications: 17-W1146
Page 1 of 2

Table with 2 columns: MDU Sample Identification (104) and MVTL Laboratory # (17-W1146)

I. RECEIPT

- All samples were received at the laboratory on 21 Apr17 at 1058.
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 7.2°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.
Methods 6010D and Method 6020B were used to analyze the metals.

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.
For some metals, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
Recoveries for two lithium matrix spike duplicates were outside of the acceptable limits. Recoveries of the matrix spikes were acceptable. RPDs for the recoveries of the matrix spikes/matrix spike duplicates were acceptable. No further action was taken.
The recoveries for one fluoride 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.



**CASE NARRATIVE – AMENDED 6 JUL 17 (Work Order)**

**MVTL Lab Reference No/SDG:** 2017782-0994  
**Client:** Montana Dakota Utilities  
**Location:** MDU Heskett  
**Project Identification:** CCR April 2017  
**MVTL Laboratory Identifications:** 17-W1146  
Page 2 of 2

**V. REPORTING**

- On 6 Jul 17, it was discovered that the template used to create the case narrative had an extra 7 in the work order (e.g. 2017782-0994). Case narrative has been corrected to reflect the correct work order.

All laboratory data has been approved by MVTL Laboratories.

**SIGNED:** Claudette Carroll **DATE:** 7 JUL 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



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MEMBER  
ACIL

Page: 1 of 2

## Quality Control Report

Lab ID: 17-W1146

Project: MDU Heskett - CCR

Work Order: 201782-0994

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 - Total mg/l	0.1000	108	80-120	0.400	17W1146q	< 0.001	0.4444	111	75-125	0.4444	0.4196	105	5.7	20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	106	80-120	0.400	17W1146q	< 0.005	0.4526	113	75-125	0.4526	0.4200	105	7.5	20	-	-	< 0.002
Barium - Total mg/l	0.1000	104	80-120	0.400	17W1146q	0.0089	0.3982	97	75-125	0.3982	0.3672	90	8.1	20	-	-	< 0.002
Beryllium - Total mg/l	0.1000	109	80-120	0.400	17W1146q	< 0.001	0.4274	107	75-125	0.4274	0.4084	102	4.5	20	-	-	< 0.0005
Boron - Total mg/l	0.40	100	80-120	0.400	17-W1107 17-W1146	0.39 0.81	0.75 2.32	90 101	75-125 75-125	0.75 2.32	0.76 2.37	92 104	1.3 2.1	20 20	- -	- -	< 0.1 < 0.1
Cadmium - Total mg/l	0.1000	111	80-120	0.400	17W1146q	< 0.0005	0.4354	109	75-125	0.4354	0.4166	104	4.4	20	-	-	< 0.0005
Calcium - Total mg/l	20.0	106	80-120	1000	17W1146q	444	1430	99	75-125	1430	1390	95	2.8	20	-	-	< 1 < 1
Chloride mg/l	30.0 30.0	107 87	80-120 80-120	30.0	17-W1098	19.1	50.8	106	80-120	50.8	48.3	97	5.0	20	- -	- -	< 1 < 1
Chromium - Total mg/l	0.1000	105	80-120	0.400	17W1146q	< 0.002	0.4200	105	75-125	0.4200	0.3914	98	7.0	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	104	80-120	0.400	17W1146q	0.0023	0.4134	103	75-125	0.4134	0.3928	98	5.1	20	-	-	< 0.002
Fluoride mg/l	0.50 0.50	108 106	90-110 90-110	0.500 1.00	17-W1146 17-D1256	0.59 4.34	0.95 5.48	72 114	80-120 80-120	0.95 5.48	0.95 5.44	72 110	0.0 0.7	20 20	- -	- -	< 0.1 < 0.1 < 0.1
Lead - Total mg/l	0.1000	104	80-120	0.400	17W1146q	< 0.001	0.3890	97	75-125	0.3890	0.3696	92	5.1	20	-	-	< 0.0005
Lithium - Total mg/l	0.40	105	80-120	0.400 1.00	17-W1107 17-W1146	1.55 2.06	2.03 3.18	120 112	75-125 75-125	2.03 3.18	2.09 3.32	135 126	2.9 4.3	20 20	- -	- -	< 0.1 < 0.1 < 0.1
Mercury - Total mg/l	0.0020	110	85-115	0.002 0.002	AA14480 17-W1146	< 0.0002 < 0.0002	0.0020 0.0020	100 100	70-130 70-130	0.0020 0.0020	0.0021 0.0021	105 105	4.9 4.9	20 20	- -	- -	< 0.0002
Molybdenum - Total mg/l	0.1000	102	80-120	0.400	17-W1146	0.0041	0.4422	110	75-125	0.4422	0.4172	103	5.8	20	-	-	< 0.002
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.0 6.8	7.1 7.8	- -	1.4 13.7	20 20	- -	- -	- -

**Quality Control Report**

Lab ID: 17-W1146

Project: MDU Heskett - CCR

Work Order: 201782-0994

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 - Total mg/l	0.1000	96	80-120	0.400	17-W1146	0.1264	0.5276	100	75-125	0.5276	0.5478	105	3.8	20	-	-	< 0.002
Sulfate mg/l	100	104	80-120	100	17-W1451	< 5	96.1	96	80-120	96.1	95.0	95	1.2	20	-	-	< 5
Thallium - Total mg/l	0.1000	104	80-120	0.400	17W1146q	< 0.0005	0.3904	98	75-125	0.3904	0.3716	93	4.9	20	-	-	< 0.0005
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	326000	306000	-	6.3	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	276000	275000	-	0.4	20	-	-	

Approved by: \_\_\_\_\_

*C. CMTD*

*15 May 17*



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 1 of 1

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 11 May 17  
 Lab Number: 17-W1146  
 Work Order #: 82-0994  
 Account #: 002800  
 Date Sampled: 21 Apr 17 9:15  
 Date Received: 21 Apr 17 10:58  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 104

Temp at Receipt: 7.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	21 Apr 17	KMD
pH - Field	7.00	units	NA	SM 4500 H+ B	21 Apr 17 9:15	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	21 Apr 17 18:00	SVS
Temperature - Field	8.14	Degrees C	NA	SM 2550B	21 Apr 17 9:15	DJN
Conductivity - Field	13821	umhos/cm	1	EPA 120.1	21 Apr 17 9:15	DJN
Fluoride	0.59	mg/l	0.10	SM4500-F-C	24 Apr 17 18:00	SVS
Sulfate	10400	mg/l	5.00	ASTM D516-07	5 May 17 9:17	EMS
Chloride	108	mg/l	1.0	SM4500-Cl-E	2 May 17 11:40	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Apr 17 11:16	EV
Total Dissolved Solids	14500	mg/l	10	I1750-85	26 Apr 17 11:06	SVS
Calcium - Total	444	mg/l	1.0	6010	24 Apr 17 11:34	SZ
Lithium - Total	2.06	mg/l	0.10	6010	25 Apr 17 15:24	KMD
Boron - Total	0.81	mg/l	0.10	6010	24 Apr 17 17:00	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	10 May 17 12:45	KMD
Arsenic - Total	< 0.005 ^	mg/l	0.0020	6020	10 May 17 12:45	KMD
Barium - Total	0.0089	mg/l	0.0020	6020	10 May 17 12:45	KMD
Beryllium - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	10 May 17 12:45	KMD
Cobalt - Total	0.0023	mg/l	0.0020	6020	10 May 17 12:45	KMD
Lead - Total	< 0.001 ^	mg/l	0.0005	6020	10 May 17 12:45	KMD
Molybdenum - Total	0.0041	mg/l	0.0020	6020	11 May 17 14:42	KMD
Selenium - Total	0.1264	mg/l	0.0020	6020	11 May 17 8:40	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	10 May 17 12:45	KMD

\* Holding time exceeded

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

Approved by:

*Cc*  
*Claudette K. Carroll 15 May 17*

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

CERTIFICATION: ND # ND-00016



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 104  
Sampling Personal: *Darren Newmy*

Weather Conditions: Temp: 39 °F Wind: *Light* Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	13.21	ft	
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	22.20	ft	
Water Level After Sample:	13.50	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	21 April 17	Time Purging Began:	0830 am/pm	
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	21 April 17	Time of Sampling:	0915 am/pm	
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	0835	7.95	13055	7.09	3.24	82.6	11.3	13.44	500	clear
2	0850	7.86	13667	7.01	2.22	68.7	9.56	13.44	500	clear
3	0855	7.92	13713	7.00	2.04	68.0	5.16	13.48	500	clear
4	0900	8.12	13723	7.00	1.61	67.6	3.42	13.51	500	clear
5	0905	7.99	13779	7.00	1.63	67.4	2.38	13.48	500	clear
6	0910	8.11	13788	7.00	1.58	67.0	2.50	13.48	500	clear
7	0915	8.14	13821	7.00	1.64	66.8	2.31	13.48	500	clear
8										
9										
10										

Stabilized: Yes No  
Comments: *(Signature)*

Total Volume Removed: 4500 mL



**Laboratories, Inc.**  
 2616 E. Broadway  
 Bismarck, ND 58501  
 Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-0994
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Darren Nieswan

Lab Number	Sample Information				Bottle Type			Field Parameters			Analysis Required
	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric	500mL Nitric (filtered)	Temp (°C)	Spec. Cond.	pH	
W1146	104	21 April	09:15	GW	X	X	X	8.14	1382	7.00	MDU CCR List with TSS and Dissolved CCR Metals.

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswan</i>	21 April 10:58	(Log In) Walk In #2	20.2 / 7.2 TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>Angela Simonson</i>	21 April 17 10:58



**CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 201782-0997  
**IML Lab Reference No/SDG:** S1704320  
**Client:** Montana Dakota Utilities  
**Location:** MDU Heskett Ash Site  
**Project Identification:** CCR April 2017  
**MVTL Laboratory Identifications:** 17-W1150  
**IML Laboratory Identifications:** S1704320-001  
**Page 1 of 2**

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
104	17-W1150	S1704320-001

**I. RECEIPT**

- All samples were received at the laboratory on 21 Apr 2017 at 1058.
- 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 7.2°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 26 Apr 2017.
  - 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.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0997  
IML Lab Reference No/SDG: S1704320  
Client: Montana Dakota Utilities  
Location: MDU Heskett Ash Site  
Project Identification: CCR April 2017  
MVTL Laboratory Identifications: 17-W1150  
IML Laboratory Identifications: S1704320-001

Page 2 of 2

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7/20/17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1150  
Work Order #: 82-0997  
Account #: 002800  
Date Sampled: 21 Apr 17 9:15  
Date Received: 21 Apr 17 10:58  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 104

Temp at Receipt: 7.2C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.00	units	NA	SM 4500 H+ B	21 Apr 17	9:15	DJN
Temperature - Field	8.14	Degrees C	NA	SM 2550B	21 Apr 17	9:15	DJN
Conductivity - Field	13821	umhos/cm	1	EPA 120.1	21 Apr 17	9:15	DJN
Radium 226	See Attached Report				9 May 17		OL
Radium 228	See Attached Report				27 May 17		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> *7 Jun 17*

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

CERTIFICATION: ND # ND-00016



Date: 5/30/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782-0997  
**Lab Order:** S1704320

**CASE NARRATIVE**  
**Report ID:** S1704320001

Sample 17-W1150 104 was received on April 26, 2017.

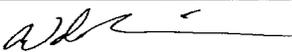
All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"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

LCSD-1746 - Radium 226 in Water -/Radium 226 - RPD outside accepted recovery limits

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704320001

**ProjectName:** 201782-0997  
**Lab ID:** S1704320-001  
**ClientSample ID:** 17-W1150 104  
**COC:** 201782-0997

**WorkOrder:** S1704320  
**CollectionDate:** 4/21/2017 9:15:00 AM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1004	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1004	MB
Radium 228	0.2	pCi/L		1	Ga-Tech	05/27/2017 1657	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	05/27/2017 1657	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Laboratories, Inc.  
**Work Order:** S1704320  
**Project:** 201782-0997

**Date:** 5/30/2017  
**Report ID:** S1704320001

<b>Radium 228 by Ga/Tech</b>		Sample Type	<b>MBLK</b>		Units: pCi/L			
MB-438 (05/26/17 19:32)	RunNo: 146224	PrepDate: 05/17/17 14:00	BatchID 13153					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	ND	1						

<b>Radium 228 by Ga/Tech</b>		Sample Type	<b>LCS</b>		Units: pCi/L			
LCS-438 (05/26/17 22:35)	RunNo: 146224	PrepDate: 05/17/17 14:00	BatchID 13153					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	43	1	40.1	107	65.9 - 132			

<b>Radium 228 by Ga/Tech</b>		Sample Type	<b>MS</b>		Units: pCi/L			
MS-438 (05/27/17 04:42)	RunNo: 146224	PrepDate: 05/17/17 14:00	BatchID 13153					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228	39	1	40.1	ND	96.0	50 - 139		

<b>Radium 228 by Ga/Tech</b>		Sample Type	<b>MSD</b>		Units: pCi/L			
MSD-438 (05/27/17 07:46)	RunNo: 146224	PrepDate: 05/17/17 14:00	BatchID 13153					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228	44	1	39	14.2	111	20		

<b>Radium 226 in Water -</b>		Sample Type	<b>MBLK</b>		Units: pCi/L			
MB-1746 (05/09/17 10:04)	RunNo: 145695	PrepDate: 05/01/17 0:00	BatchID 13143					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	ND	0.2						

<b>Radium 226 in Water -</b>		Sample Type	<b>LCS</b>		Units: pCi/L			
LCS-1746 (05/09/17 10:04)	RunNo: 145695	PrepDate: 05/01/17 0:00	BatchID 13143					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	5.1	0.2	5.89	86.3	67.1 - 122			

<b>Radium 226 in Water -</b>		Sample Type	<b>LCSD</b>		Units: pCi/L			
LCSD-1746 (05/09/17 10:04)	RunNo: 145695	PrepDate: 05/01/17 0:00	BatchID 13143					
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226	7.0	0.2	5.1	32.1	119	20	R	

<b>Radium 226 in Water -</b>		Sample Type	<b>MS</b>		Units: pCi/L			
S1704319-001AMS (05/09/17 10:04)	RunNo: 145695	PrepDate: 05/01/17 0:00	BatchID 13143					
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226	12.3	0.2	11.8	ND	105	65 - 131		

- Qualifiers:**
- B 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
  - 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

Phone: (701) 258-9720  
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

201782-0997

Company Name and Address:  <u>MVTL</u> <u>2616 E Broadway</u> <u>Bismarck, ND 58501</u>	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  <u>PO Box 249</u> <u>New Ulm, MN 56073</u>	Name of Sampler:	E-mail: <u>ccarroll@mvtl.com</u> For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 24-Apr-17
	Project Name/Number:	Purchase Order #: BL5843

Sample Information						Bottle Type					Analysis	
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials	Impreserved	Glass Jar	Other	Analysis Required
91704320 001	17-W1150	104	GW	21-Apr-17	915		4					Ra226 & Ra228

Comments: All results must be reported as a numerical value.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	24-Apr-17	1700		Kathy Boyd	4-26-17	12.10
2.						10.3



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 104  
Sampling Personal: Darren Murray

Weather Conditions: Temp: 39 °F Wind: Light Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	13.21 ft		
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	22.20 ft		
Water Level After Sample:	13.50 ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	21 Apr 17	Time Purging Began:	0830	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	21 Apr 17	Time of Sampling:	0915	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
1	0835	7.95	13055	7.09	3.24	68.6	11.3	13.44	500	clear
2	0850	7.86	13617	7.01	2.22	68.7	9.56	13.44	500	clear
3	0855	7.92	13713	7.00	2.04	68.0	5.16	13.48	500	clear
4	0900	8.12	13723	7.00	1.61	67.6	3.42	13.51	500	clear
5	0905	7.99	13779	7.00	1.63	67.4	2.38	13.48	500	clear
6	0910	8.11	13788	7.00	1.58	67.0	2.50	13.48	500	clear
7	0915	8.14	13821	7.00	1.64	66.8	2.31	13.48	500	clear
8										
9										
10										

Stabilized: Yes  No

Total Volume Removed: 4500 mL

Comments:



**Laboratories, Inc.**  
 2616 E. Broadway  
 Bismarck, ND 58501  
 Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 24 APR 17 150 <del>W</del> 82-0997
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Parren Nieswaag

Sample Information					Bottle Type				Field Parameters			Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	1 liter Nitric				Temp (°C)	Spec. Cond.	pH	Analysis Required	
W1150	104	21 Apr 17	0915	GW	4				8.14	1382	7.00	Rad 226 & Rad 228	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Parren Nieswaag</i>	21 Apr 17 1058	<del>Log In</del> Walk In #2	ROI 7.2 TM562 / <del>TM588</del>
2			

Received by:	
Name:	Date/Time
<i>Angel Simonson</i>	21 April 17 1058



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0998
IML Lab Reference No/SDG: S1704321
Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site
Project Identification: CCR April 2017
MVTL Laboratory Identifications: 17-W1151 through 17-W1157
IML Laboratory Identifications: S1704321-001 through S1704321-007

Page 1 of 2

Table with 3 columns: MDU Sample Identification, MVTL Laboratory #, IML Laboratory #. Rows include samples FB1, DUP1, 13, 101, 102, 103, and 70 with their corresponding lab numbers.

I. RECEIPT

- All samples were received at the laboratory on 21 Apr 2017 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 15.5°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 26 Apr 2017.
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.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0998  
IML Lab Reference No/SDG: S1704321  
Client: Montana Dakota Utilities  
Location: MDU Heskett Ash Site  
Project Identification: CCR April 2017  
MVTL Laboratory Identifications: 17-W1151 through 17-W1157  
IML Laboratory Identifications: S1704321-001 through S1704321-007  
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.

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7 Jun 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager





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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1152  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: Dup 1

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			27 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>CC</sup> 7/5/17

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1153  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17 8:55  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 13

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.96	units	NA	SM 4500 H+ B	19 Apr 17	8:55	DJN
Temperature - Field	8.01	Degrees C	NA	SM 2550B	19 Apr 17	8:55	DJN
Conductivity - Field	10457	umhos/cm	1	EPA 120.1	19 Apr 17	8:55	DJN
Radium 226	See Attached Report				9 May 17		OL
Radium 228	See Attached Report				28 May 17		OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll *CC*  
*7 JUN 17*

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1154  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17 15:03  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 101

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.74 units	NA	SM 4500 H+ B	19 Apr 17 15:03	DJN
Temperature - Field	8.97 Degrees C	NA	SM 2550B	19 Apr 17 15:03	DJN
Conductivity - Field	4733 umhos/cm	1	EPA 120.1	19 Apr 17 15:03	DJN
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*CC  
7 JUN 17*

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1155  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17 11:38  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 102

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.88	units	NA	SM 4500 H+ B	19 Apr 17 11:38	DJN
Temperature - Field	8.07	Degrees C	NA	SM 2550B	19 Apr 17 11:38	DJN
Conductivity - Field	6813	umhos/cm	1	EPA 120.1	19 Apr 17 11:38	DJN
Radium 226	See Attached Report				9 May 17	OL
Radium 228	See Attached Report				28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> <sub>7 Jun 17</sub>

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1156  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17 16:35  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 103

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.73	units	NA	SM 4500 H+ B	19 Apr 17 16:35	DJN
Temperature - Field	8.46	Degrees C	NA	SM 2550B	19 Apr 17 16:35	DJN
Conductivity - Field	4993	umhos/cm	1	EPA 120.1	19 Apr 17 16:35	DJN
Radium 226	See Attached Report				9 May 17	OL
Radium 228	See Attached Report				28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>CC</sup> 7 Jun 17

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1157  
Work Order #: 82-0998  
Account #: 002800  
Date Sampled: 19 Apr 17 13:23  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 70

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.02 units	NA	SM 4500 H+ B	19 Apr 17 13:23	DJN
Temperature - Field	8.60 Degrees C	NA	SM 2550B	19 Apr 17 13:23	DJN
Conductivity - Field	4313 umhos/cm	1	EPA 120.1	19 Apr 17 13:23	DJN
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* *7 Jun 17*

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

CERTIFICATION: ND # ND-00016



Date: 5/30/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782--0998  
**Lab Order:** S1704321

**CASE NARRATIVE**  
**Report ID:** S1704321001

Samples 17-W1151 FB1, 17-W1152 Dup 1, 17-W1153 13, 17-W1154 101, 17-W1155 102, 17-W1156 103, and 17-W1157 70 were received on April 26, 2017.

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

LCSD-1746 - Radium 226 in Water -/Radium 226 - RPD outside accepted recovery limits

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-001  
**ClientSample ID:** 17-W1151 FB1  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1004	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	05/09/2017 1004	MB
Radium 228	0.9	pCi/L		1	Ga-Tech	05/27/2017 2000	MB
Radium 228 Precision (±)	3.0	pCi/L			Ga-Tech	05/27/2017 2000	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-002  
**ClientSample ID:** 17-W1152 Dup 1  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1004	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1004	MB
Radium 228	0.2	pCi/L		1	Ga-Tech	05/27/2017 2304	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	05/27/2017 2304	MB

These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-003  
**ClientSample ID:** 17-W1153 13  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017 8:55:00 AM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1004	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1004	MB
Radium 228	0.8	pCi/L		1	Ga-Tech	05/28/2017 207	MB
Radium 228 Precision (±)	2.5	pCi/L			Ga-Tech	05/28/2017 207	MB

These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-004  
**ClientSample ID:** 17-W1154 101  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017 3:03:00 PM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1004	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1004	MB
Radium 228	-2.5	pCi/L		1	Ga-Tech	05/28/2017 511	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	05/28/2017 511	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-005  
**ClientSample ID:** 17-W1155 102  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017 11:38:00 AM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	-1.6	pCi/L		1	Ga-Tech	05/28/2017 815	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	05/28/2017 815	MB

These results apply only to the samples tested.

RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-006  
**ClientSample ID:** 17-W1156 103  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017 4:35:00 PM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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#### Radionuclides - Total

Radium 226	0.15	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1241 MB
Radium 228	-1.3	pCi/L		1	Ga-Tech	05/28/2017 1118 MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	05/28/2017 1118 MB

These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/30/2017  
**Report ID** S1704321001

**ProjectName:** 201782--0998  
**Lab ID:** S1704321-007  
**ClientSample ID:** 17-W1157 70  
**COC:** 201782-0998

**WorkOrder:** S1704321  
**CollectionDate:** 4/19/2017 1:23:00 PM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	0.5	pCi/L		1	Ga-Tech	05/28/2017 1422	MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	05/28/2017 1422	MB

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1704321
Project: 201782--0998

Date: 5/30/2017
Report ID: S1704321001

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-438 (05/26/17 19:32), Analyte, 146224, 05/17/17 14:00, 13153, ND, 1, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-438 (05/26/17 22:35), Analyte, 146224, 05/17/17 14:00, 13153, 43, 1, 40.1, 107, 65.9 - 132, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MS-438 (05/27/17 04:42), Analyte, 146224, 05/17/17 14:00, 13153, 39, 1, 40.1, ND, 96.0, 50 - 139, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: MSD-438 (05/27/17 07:46), Analyte, 146224, 05/17/17 14:00, 13153, 44, 1, 39, 14.2, 111, 20, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1746 (05/09/17 10:04), Analyte, 145695, 05/01/17 0:00, 13143, ND, 0.2, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1746 (05/09/17 10:04), Analyte, 145695, 05/01/17 0:00, 13143, 5.1, 0.2, 5.89, 86.3, 67.1 - 122, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: LCSD-1746 (05/09/17 10:04), Analyte, 145695, 05/01/17 0:00, 13143, 7.0, 0.2, 5.1, 32.1, 119, 20, R, Units: pCi/L.

Table with 10 columns: Sample ID, Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: S1704319-001AMS (05/09/17 10:04), Analyte, 145695, 05/01/17 0:00, 13143, 12.3, 0.2, 11.8, ND, 105, 65 - 131, Units: pCi/L.

- Qualifiers: B 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, 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

Phone: (701) 258-9720  
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

201782-0998

Company Name and Address:  <u>MVTL</u> <u>2616 E Broadway</u> <u>Bismarck, ND 58501</u>	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  <u>PO Box 249</u> <u>New Ulm, MN 56073</u>	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 24-Apr-17
	Project Name/Number:	Purchase Order #: BL5841

Sample Information						Bottle Type					Analysis
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Unpreserved	Glass Jar	Other	Analysis Required
S1704321 001	17-W1151	FB1	GW	19-Apr-17			4				Ra226 & Ra228
002	17-W1152	Dup1	GW	19-Apr-17			4				Ra226 & Ra228
003	17-W1153	13	GW	19-Apr-17	855		4				Ra226 & Ra228
004	17-W1154	101	GW	19-Apr-17	1503		4				Ra226 & Ra228
005	17-W1155	102	GW	19-Apr-17	1138		4				Ra226 & Ra228
006	17-W1156	103	GW	19-Apr-17	1635		4				Ra226 & Ra228
007	17-W1157	70	GW	19-Apr-17	1323		4				Ra226 & Ra228

Comments: All results must be reported as a numerical value.

2 coolers

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	24-Apr-17	1700		Patthy Boyd	4-26-17 12:10	11.3
2.						12.9



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 13  
Sampling Personal: Jerry Payer

Weather Conditions: Temp: 40 °F Wind: NES-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	28.76	ft
Total Well Depth:	—	
Well Volume:	—	
Depth to Top of Pump:	—	
Water Level After Sample:	29.23	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		PSI:	20
Duplicate Sample ID:	Dug 1		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	0805	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	—	am/pm
Sample Date:	19 Apr 17	Time of Sampling:	0855	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	0810	7.70	10365	6.95	4.01	216.5	3.89	29.15	500.0	Clear
2	0815	7.78	10353	6.95	3.90	220.2	3.96	29.20	500.0	Clear
3	0820	7.77	10357	6.95	3.94	220.9	1.90	29.27	500.0	Clear
4	0825	7.81	10345	6.95	3.96	221.4	2.23	29.30	500.0	Clear
5	0830	7.89	10355	6.96	4.06	204.0	10.0	29.25	500.0	Clear
6	0835	7.91	10374	6.96	4.22	154.9	11.9	29.24	500.0	Clear
7	0840	7.91	10395	6.96	4.30	98.7	12.4	29.25	500.0	Clear
8	0845	7.97	10412	6.96	4.25	77.8	9.36	29.24	500.0	Clear
9	0850	8.03	10424	6.96	4.26	69.4	9.52	29.25	500.0	Clear
10	0855	8.01	10457	6.96	4.35	62.1	9.74	29.24	500.0	Clear

Stabilized: Yes  No   
Comments:

Total Volume Removed: 5000.0 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 101  
Sampling Personal: Jerry Mayon

Weather Conditions: Temp: 45 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	36.54		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	40.32		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	25
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	19 Apr 17	Time Purging Began:	1422	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	19 Apr 17	Time of Sampling:	1503	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

SEQ #	Time	Stabilization (3 consecutive) Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
2	1437	8.90	4751	6.76	1.26	11.7	8.65	38.25	7000.0	Clear
3	1447	8.91	4739	6.75	1.06	7.6	9.00	39.08	1000.0	Clear
4	1453	9.02	4736	6.75	1.06	11.8	8.30	39.15	500.0	Clear
5	1458	8.96	4734	6.75	1.02	16.0	7.92	39.20	500.0	Clear
6	1503	8.97	4733	6.74	1.07	19.6	7.81	39.25	500.0	Clear
7										
8										
9										
10										

Stabilized: Yes  No   
Comments:

Total Volume Removed: 4000.0 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 102  
Sampling Personal: Jerry [Signature]

Weather Conditions: Temp: 45 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	15.48	ft
Total Well Depth:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	18.15	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>5</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: <u>15</u>
Duplicate Sample ID:	—	Pumping Rate: <u>100</u> mL/min
Purge Date:	19 Apr 17	Time Purging Began: <u>1053</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: <u>—</u> am/pm
Sample Date:	19 Apr 17	Time of Sampling: <u>1138</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ #	Time									clear, slightly turbid, turbid
1	1058	8.18	8031	6.80	1.83	46.6	17.9	16.35	500.0	clear
2	1108	8.19	7563	6.78	0.96	32.4	2.70	16.78	1000.0	clear
3	1108/1113	8.16	7268	6.79	0.98	30.5	1.29	16.92	500.0	clear
4	1118	8.19	7220	6.79	0.97	27.7	1.05	17.08	500.0	clear
5	1123	8.29	7129	6.80	0.95	21.1	0.71	17.20	500.0	clear
6	1128	8.27	7001	6.81	1.36	17.1	0.52	17.25	500.0	clear
7	1123	8.33	6774	6.84	1.45	13.0	0.52	17.31	500.0	clear
8	1128	8.27	6775	6.86	1.70	10.4	0.33	17.40	500.0	clear
9	1133	8.18	6774	6.87	1.76	7.7	0.32	17.50	500.0	clear
10	1138	8.07	6813	6.88	1.8	4.5	0.36	17.52	500.0	clear

Stabilized: Yes  No

Total Volume Removed: 5500.0 mL

Comments:







**Laboratories, Inc.**

2616 E. Broadway  
Bismarck, ND 58501  
Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> <b>MDU Heskett</b>	<b>Event:</b> <b>April 2017</b>	<b>Work Order Number:</b> <b>82-0998</b>
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> <i>Jeremy Shyne</i>

Lab Number	Sample ID	Date	Time	Sample Type	Bottle Type							Field Parameters			Analysis Required	
					1 liter Nitric								Temp (°C)	Spec. Cond.		pH
W1151	FB1	19 Apr 17	—	GW	4								—	—	—	Rad 226 & Rad 228
W1152	Dup 1	19 Apr 17	—	GW	4								—	—	—	
W1153	13	19 Apr 17	0855	GW	4							8.01	10457	6.96		
W1154	101	19 Apr 17	1503	GW	4							8.97	4733	6.74		
W1155	102	19 Apr 17	1138	GW	4							8.07	6813	6.88		
W1156	103	19 Apr 17	1635	GW	4							8.46	4993	6.73		
W1157	70	19 Apr 17	1323	GW	4							8.60	4313	7.02		

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
<i>[Signature]</i>	21 Apr 17	Log In	15.5
	6740	Walk In #2	TM562 / (TM588)

Received by:	
Name:	Date/Time
<i>Angel Simonson</i>	21 April 17
	800



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0999
IML Lab Reference No/SDG: S1704322
Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site
Project Identification: CCR April 2017
MVTL Laboratory Identifications: 17-W1158 through 17-W1165
IML Laboratory Identifications: S1704322-001 through S1704322-007
Page 1 of 2

Table with 3 columns: MDU Sample Identification, MVTL Laboratory #, IML Laboratory #. Rows include samples FB2, DUP2, 2-90, 3-90, 33, 44R, 80R, 105 with their corresponding lab numbers.

I. RECEIPT

- All samples were received at the laboratory on 21 Apr 2017 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 15.5°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 26 Apr 2017.
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



## CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0999  
IML Lab Reference No/SDG: S1704322  
Client: Montana Dakota Utilities  
Location: MDU Heskett Ash Site  
Project Identification: CCR April 2017  
MVTL Laboratory Identifications: 17-W1158 through 17-W1165  
IML Laboratory Identifications: S1704322-001 through S1704322-007  
Page 2 of 2

- 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.
- Sample 2-90 (17-W1160) was lost in a laboratory accident and was recollected at a later date.

### V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7 Jun 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1158  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: FB2

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll

CC  
7 JUN 17

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 6 Jun 17  
 Lab Number: 17-W1159  
 Work Order #: 82-0999  
 Account #: 002800  
 Date Sampled: 20 Apr 17  
 Date Received: 21 Apr 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: Dup 2

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> *7/26/17*

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1160  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17 15:25  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 2-90

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.90	units	NA	SM 4500 H+ B	20 Apr 17 15:25	JSM
Temperature - Field	8.66	Degrees C	NA	SM 2550B	20 Apr 17 15:25	JSM
Conductivity - Field	7797	umhos/cm	1	EPA 120.1	20 Apr 17 15:25	JSM

Approved by:

*Claudette K. Carroll*

CC  
7 JUN 17

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1161  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17 14:05  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 3-90

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.89 units	NA	SM 4500 H+ B	20 Apr 17 14:05	JSM
Temperature - Field	8.07 Degrees C	NA	SM 2550B	20 Apr 17 14:05	JSM
Conductivity - Field	4851 umhos/cm	1	EPA 120.1	20 Apr 17 14:05	JSM
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			28 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll

CC  
7 Jun 17

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1162  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17 12:40  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTl Field Services

Project Name: MDU Heskett  
Sample Description: 33

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.59	units	NA	SM 4500 H+ B	20 Apr 17 12:40	JSM
Temperature - Field	8.76	Degrees C	NA	SM 2550B	20 Apr 17 12:40	JSM
Conductivity - Field	4998	umhos/cm	1	EPA 120.1	20 Apr 17 12:40	JSM
Radium 226	See Attached Report				9 May 17	OL
Radium 228	See Attached Report				29 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> *JSM*

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1163  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17 7:43  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Heskett  
Sample Description: 44R

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.60 units	NA	SM 4500 H+ B	20 Apr 17 7:43	JSM
Temperature - Field	7.93 Degrees C	NA	SM 2550B	20 Apr 17 7:43	JSM
Conductivity - Field	9045 umhos/cm	1	EPA 120.1	20 Apr 17 7:43	JSM
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			29 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*C*  
*Claudette K. Carroll* *7 Jun 17*

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 1

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 6 Jun 17  
 Lab Number: 17-W1164  
 Work Order #: 82-0999  
 Account #: 002800  
 Date Sampled: 20 Apr 17 10:55  
 Date Received: 21 Apr 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 80R

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.12 units	NA	SM 4500 H+ B	20 Apr 17 10:55	JSM
Temperature - Field	7.48 Degrees C	NA	SM 2550B	20 Apr 17 10:55	JSM
Conductivity - Field	5747 umhos/cm	1	EPA 120.1	20 Apr 17 10:55	JSM
Radium 226	See Attached Report			9 May 17	OL
Radium 228	See Attached Report			29 May 17	OL

OL = Analysis performed by an Outside Laboratory.

CL  
 7 Jun 17

Approved by: Claudette K. Carroll

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

CERTIFICATION: ND # ND-00016



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Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 6 Jun 17  
Lab Number: 17-W1165  
Work Order #: 82-0999  
Account #: 002800  
Date Sampled: 20 Apr 17 9:25  
Date Received: 21 Apr 17 8:00  
Sampled By: MVTl Field Services

Project Name: MDU Heskett  
Sample Description: 105

Temp at Receipt: 15.5C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.75	units	NA	SM 4500 H+ B	20 Apr 17	9:25	JSM
Temperature - Field	7.36	Degrees C	NA	SM 2550B	20 Apr 17	9:25	JSM
Conductivity - Field	7168	umhos/cm	1	EPA 120.1	20 Apr 17	9:25	JSM
Radium 226	See Attached Report				9 May 17		OL
Radium 228	See Attached Report				29 May 17		OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*CC  
7 Jun 17*

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

CERTIFICATION: ND # ND-00016



Date: 6/5/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782-0999  
**Lab Order:** S1704322

**CASE NARRATIVE**  
**Report ID:** S1704322002  
(Replaces S1704322001)

Samples 17-W1158 FB2, 17-W1159 Dup2, 17-W1161 3-90, 17-W1162 33, 17-W1163 44R, 17-W1164 80R, and 17-W1165 105 were received on April 26, 2017.

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

LCSD-1746 - Radium 226 in Water -/Radium 226 - RPD outside accepted recovery limits

Report S1704322002 replaces report S1704322001. Client requested sample id change on S1704322-003.

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-001  
**ClientSample ID:** 17-W1158 FB2  
**COC:** 201782-0999

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.04	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	-3.5	pCi/L		1	Ga-Tech	05/28/2017 1726	MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	05/28/2017 1726	MB

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

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-002  
**ClientSample ID:** 17-W1159 Dup2  
**COC:** 201782-0999

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	-6.9	pCi/L		1	Ga-Tech	05/28/2017 2029	MB
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	05/28/2017 2029	MB

These results apply only to the samples tested.

RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-003  
**ClientSample ID:** 17-W1161 3-90  
**COC:** 201782-0999

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017 2:05:00 PM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	-1.9	pCi/L		1	Ga-Tech	05/28/2017 2333	MB
Radium 228 Precision (±)	2.7	pCi/L			Ga-Tech	05/28/2017 2333	MB

These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-004  
**ClientSample ID:** 17-W1162 33  
**COC:** 201782-0999

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017 12:40:00 PM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	0.6	pCi/L		1	Ga-Tech	05/29/2017 236	MB
Radium 228 Precision (±)	2.5	pCi/L			Ga-Tech	05/29/2017 236	MB

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

**RL - Reporting Limit**

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-005  
**ClientSample ID:** 17-W1163 44R  
**COC:** 201782-0999

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017 7:43:00 AM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1241	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1241	MB
Radium 228	-2.0	pCi/L		1	Ga-Tech	05/29/2017 540	MB
Radium 228 Precision (±)	2.9	pCi/L			Ga-Tech	05/29/2017 540	MB

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

#### RL - Reporting Limit

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - E Value above quantitation range
  - H Holding times for preparation or analysis exceeded
  - L Analyzed by another laboratory
  - ND Not Detected at the Reporting Limit
  - S Spike Recovery outside accepted recovery limits

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

Company: MVTL Laboratories, Inc.
2616 E Broadway Ave.
Bismarck, ND 58501

Date Reported 6/5/2017
Report ID S1704322002
(Replaces S1704322001)

ProjectName: 201782-0999
Lab ID: S1704322-006
ClientSample ID: 17-W1164 80R
COC: 201782-0999

WorkOrder: S1704322
CollectionDate: 4/20/2017 10:55:00 AM
DateReceived: 4/26/2017 12:10:00 PM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include Radionuclides - Total, Radium 226, Radium 226 Precision (±), Radium 228, and Radium 228 Precision (±).

These results apply only to the samples tested.

RL - Reporting Limit

- Qualifiers: B Analyte detected in the associated Method Blank
E Value above quantitation range
H Holding times for preparation or analysis exceeded
L Analyzed by another laboratory
ND Not Detected at the Reporting Limit
S Spike Recovery outside accepted recovery limits

- C Calculated Value
G Analyzed at IML Gillette laboratory
J Analyte detected below quantitation limits
M Value exceeds Monthly Ave or MCL or is less than LCL
O Outside the Range of Dilutions
X Matrix Effect

Reviewed by: [Signature]
Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 6/5/2017  
**Report ID** S1704322002  
(Replaces S1704322001)

**ProjectName:** 201782-0999  
**Lab ID:** S1704322-007  
**ClientSample ID:** 17-W1165 105  
**COC:** 201782-0999

**WorkOrder:** S1704322  
**CollectionDate:** 4/20/2017 9:25:00 AM  
**DateReceived:** 4/26/2017 12:10:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
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#### Radionuclides - Total

Radium 226	0.16	pCi/L		0.2	SM 7500 Ra-B	05/09/2017 1452 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/09/2017 1452 MB
Radium 228	-0.3	pCi/L		1	Ga-Tech	05/29/2017 1147 MB
Radium 228 Precision (±)	2.8	pCi/L			Ga-Tech	05/29/2017 1147 MB

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

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

**CLIENT:** MVTL Laboratories, Inc.  
**Work Order:** S1704322  
**Project:** 201782-0999

**Date:** 5/30/2017  
**Report ID:** S1704322001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-438 (05/26/17 19:32)	Analyte	RunNo:	146224	PrepDate:	05/17/17 14:00	BatchID	13153		
		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-438 (05/26/17 22:35)	Analyte	RunNo:	146224	PrepDate:	05/17/17 14:00	BatchID	13153		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		43	1	40.1	107	65.9 - 132			

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-438 (05/27/17 04:42)	Analyte	RunNo:	146224	PrepDate:	05/17/17 14:00	BatchID	13153		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		39	1	40.1	ND	96.0	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-438 (05/27/17 07:46)	Analyte	RunNo:	146224	PrepDate:	05/17/17 14:00	BatchID	13153		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		44	1	39	14.2	111	20		

- Qualifiers:**
- B 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
  - 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



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.  
Work Order: S1704322  
Project: 201782-0999

Date: 5/30/2017  
Report ID: S1704322001

Radium 226 in Water -		Sample Type	MBLK		Units: pCi/L				
MB-1746 (05/09/17 10:04)	Analyte	RunNo:	145695	PrepDate:	05/01/17 0:00	BatchID	13143		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
	Radium 226	ND	0.2						

MB-1747 (05/09/17 14:52)	Analyte	RunNo:	145696	PrepDate:	05/03/17 0:00	BatchID	13144		
		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-1746 (05/09/17 10:04)	Analyte	RunNo:	145695	PrepDate:	05/01/17 0:00	BatchID	13143		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
	Radium 226	5.1	0.2	5.89		86.3	67.1 - 122		

LCS-1747 (05/09/17 14:52)	Analyte	RunNo:	145696	PrepDate:	05/03/17 0:00	BatchID	13144		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
	Radium 226	5.9	0.2	6.41		91.2	67.1 - 122		

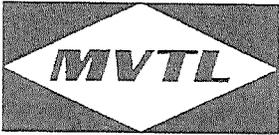
Radium 226 in Water -		Sample Type	LCSD		Units: pCi/L				
LCSD-1746 (05/09/17 10:04)	Analyte	RunNo:	145695	PrepDate:	05/01/17 0:00	BatchID	13143		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
	Radium 226	7.0	0.2	5.1	32.1	119	20	R	

LCSD-1747 (05/09/17 14:52)	Analyte	RunNo:	145696	PrepDate:	05/03/17 0:00	BatchID	13144		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
	Radium 226	6.0	0.2	5.9	1.78	92.9	20		

Radium 226 in Water -		Sample Type	MS		Units: pCi/L				
S1704319-001AMS (05/09/17 10:04)	Analyte	RunNo:	145695	PrepDate:	05/01/17 0:00	BatchID	13143		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
	Radium 226	12.3	0.2	11.8	ND	105	65 - 131		

S1704322-006AMS (05/09/17 14:52)	Analyte	RunNo:	145696	PrepDate:	05/03/17 0:00	BatchID	13144		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
	Radium 226	6.2	0.2	6.41	ND	96.8	65 - 131		

- Qualifiers:**
- B 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
  - 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

Phone: (701) 258-9720  
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

201782-0999

Company Name and Address:  <u>MVTL</u> <u>2616 E Broadway</u> <u>Bismarck, ND 58501</u>	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  <u>PO Box 249</u> <u>New Ulm, MN 56073</u>	Name of Sampler:	E-mail: <u>ccarroll@mvtl.com</u> For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 24-Apr-17
	Project Name/Number:	Purchase Order #: BL5842

Sample Information						Bottle Type					Analysis	
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials	Unpreserved	Glass Jar	Other	Analysis Required
51704322												
001	17-W1158	FB2	GW	20-Apr-17			4					Ra226 & Ra228
002	17-W1159	Dup2	GW	21-Apr-17			4					Ra226 & Ra228
	RD 17-W1160	Feb-90	GW	22-Apr-17	1525		4					Ra226 & Ra228
003	17-W1161	Mar-90	GW	23-Apr-17	1405		4					Ra226 & Ra228
004	17-W1162	33	GW	24-Apr-17	1240		4					Ra226 & Ra228
005	17-W1163	44R	GW	25-Apr-17	743		4					Ra226 & Ra228
006	17-W1164	80R	GW	26-Apr-17	1055		4					Ra226 & Ra228
007	17-W1165	105		27-Apr-17	925							Ra226 & Ra228

Comments: All results must be reported as a numerical value.

zodlers

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	24-Apr-17	1700		Kathy Boyd	4-26-17	12.9
2.						12.4





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 3-90  
Sampling Personal: Jerry Heskett

Weather Conditions: Temp: 45 °F Wind: N 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	Yes	No	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	17.30		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	17.42		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	No	Recover:	55 sec.
Duplicate Sample?:	<input checked="" type="radio"/> Yes	No	PSI:	10
Duplicate Sample ID:	Day 2		Pumping Rate:	100 mL/min
Purge Date:	20 Apr 17	Time Purging Began:	1340	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	20 Apr 17	Time of Sampling:	1405	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ #	Time								clear, slightly turbid, turbid
1	1345	8.33	4868	6.90	-45.6	2.26	17.37	500.0	clear
2	1350	8.23	4854	6.90	-49.2	1.59	17.48	500.0	clear
3	1355	8.12	4852	6.89	-47.4	0.83	17.52	500.0	clear
4	1400	8.11	4854	6.89	-43.6	0.79	17.48	500.0	clear
5	1405	8.07	4851	6.89	-41.3	0.77	17.40	500.0	clear
6									
7									
8									
9									
10									

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 2500.0 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 33  
Sampling Personal: Jerry [Signature]

Weather Conditions: Temp: 45 °F Wind: N05-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<u>No</u>	
Well Labeled?	<u>Yes</u>	No	
Casing Straight?	<u>Yes</u>	No	
Grout Seal Intact?	Yes	No	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>41.30</u>		ft
Total Well Depth:	<u>—</u>		ft
Well Volume:	<u>—</u>		liters
Depth to Top of Pump:	<u>—</u>		ft
Water Level After Sample:	<u>41.51</u>		ft
Measurement Method:	<u>Electric Water Level Indicator</u>		

### Sampling Information

Purging Method:	<u>Bladder</u>		Control Settings	
Sampling Method:	<u>Bladder</u>		Purge:	<u>5</u> sec.
Dedicated Equip?:	<u>Yes</u>	No	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	<u>20</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>20/4/17</u>	Time Purging Began:	<u>1200</u>	<u>am/pm</u>
Well Purged Dry?	Yes	<u>No</u>	Time Purged Dry:	<u>—</u> <u>am/pm</u>
Sample Date:	<u>20/4/17</u>	Time of Sampling:	<u>1240</u>	<u>am/pm</u>
Bottle List:	<u>CCR: 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric</u>			

### Field Measurements

Stabilization (3 consecutive)		Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
SEQ #	Time									
1	1205	8.73	5322	6.64	1.18	-20.2	5.59	41.50	500.0	clear
2	1215	8.77	5078	6.61	1.45	4.8	6.20	41.47	1000.0	clear
3	1225	8.76	5005	6.59	1.61	11.6	2.13	41.56	1000.0	clear
4	1230	8.71	4999	6.59	1.66	4.0	1.61	41.52	500.0	clear
5	1235	8.72	4998	6.59	1.64	-6.0	1.56	41.53	500.0	clear
6	1240	8.76	4998	6.59	1.63	-11.3	1.52	41.54	500.0	clear
7										
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 4000.0 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 44R  
Sampling Personal: Jay [Signature]

Weather Conditions: Temp: 40 °F Wind: N@S-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	25.05	ft
Total Well Depth:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	25.11	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: 55 sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: 20
Duplicate Sample ID:	—	Pumping Rate: 100 mL/min
Purge Date:	20 Apr 17	Time Purging Began: 0653 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: — am/pm
Sample Date:	20 Apr 17	Time of Sampling: 0743 am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	0658	7.73	9029	6.62	3.50	264.6	62.3	25.11	500.0	clear
2	0718	7.76	9043	6.60	2.50	249.4	9.44	25.18	2000.0	clear
3	0728	7.82	9049	6.60	2.45	245.0	7.59	25.15	1000.0	clear
4	0733	7.82	9040	6.60	2.43	242.4	6.35	25.19	500.0	clear
5	0738	7.89	9044	6.60	2.31	240.7	6.64	25.10	500	clear
6	0743	7.93	9045	6.60	2.36	239.0	6.21	25.08	500.0	clear
7										
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 5000.0 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 80 R  
Sampling Personal: Jerry Hays

Weather Conditions: Temp: 45 °F Wind: N0570 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	14.24	ft
Total Well Depth:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	14.52	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>5</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>15</u>
Duplicate Sample ID:	—	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>20 Apr 17</u>	Time Purging Began: <u>1015</u> am/pm
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry: <u>—</u> am/pm
Sample Date:	<u>20 Apr 17</u>	Time of Sampling: <u>1055</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1020	7.50	5749	7.13	3.18	179.0	0.35	14.40	500.0	Clear
2	1025	7.42	5736	7.13	1.20	179.7	0.41	14.48	500.0	Clear
3	1030	7.47	5739	7.12	0.95	179.9	0.42	14.55	500.0	clear
4	1035	7.44	5738	7.13	0.87	169.9	0.48	14.58	500.0	Clear
5	1040	7.38	5742	7.12	0.84	143.8	1.13	14.56	500.0	clear
6	1045	7.38	5741	7.12	0.77	122.3	0.79	14.57	500.0	clear
7	1050	7.45	5743	7.12	0.74	116.5	0.84	14.59	500.0	clear
8	1055	7.48	5742	7.12	0.74	111.3	0.88	14.57	500.0	clear
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 4000.0 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett

Event: 2017

Sample ID: 105

Sampling Personal: Jerry May

Weather Conditions: Temp: 45 °F Wind: N05-10 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:		2"	
Water Level Before Purge:		12.24	ft
Total Well Depth:		—	ft
Well Volume:		—	liters
Depth to Top of Pump:		—	ft
Water Level After Sample:		2+ 12.58	ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 5 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes No	Recover: 55 sec.
Duplicate Sample?:	Yes <input checked="" type="radio"/> No	PSI: 10
Duplicate Sample ID:	—	Pumping Rate: 100 mL/min
Purge Date:	20 Apr 17	Time Purging Began: 0845 am/pm
Well Purged Dry?:	Yes <input checked="" type="radio"/> No	Time Purged Dry: — am/pm
Sample Date:	20 Apr 17	Time of Sampling: 0925 am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	0850	6.99	6334	6.79	0.99	142.6	9.54	12.58	500.0	Clear
2	0900	7.24	6245	6.78	0.69	175.7	3.71	12.55	1000.0	Clear
3	0905	7.27	6556	6.77	0.68	172.8	4.23	12.56	500.0	Clear
4	0910	7.35	6775	6.76	0.67	171.0	4.53	12.58	500.0	Clear
5	0915	7.28	6932	6.76	0.68	170.2	4.37	12.55	500.0	Clear
6	0920	7.32	7076	6.75	0.68	169.7	4.16	12.57	500.0	Clear
7	0925	7.36	7168	6.75	0.68	169.3	4.17	12.56	500.0	Clear
8	<del>0930</del>									
9										
10										

Stabilized:  Yes No

Total Volume Removed: 4000.0 mL

Comments:

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Jerry P. [Signature]

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	19 Apr 17		Time:	0650		
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	19.47	6.97	7.00	6.95-7.05	-22.6	0 +/- 50
Buffer 10	19.73	9.89	10.00	9.95-10.05	-196.5	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	19.11	10225	10,003	±10%	Buffer 5000	5002
<b>ORP</b>						
231 mV @ 25C	7.95	241.5	250.5	±10 mV		
<b>DO</b>						
	10.00	104.8%	94.2%	Barometric Pressure (mm Hg)		
				mg/L	716.11	

Post Site Check		
Time:	1640	
<b>pH</b>	Temp °C	Reading
Buffer 7	15.31	7.02
<b>Conductivity</b>		
Buffer 5000	16.30	5009

Pre Site Calibration						
Date:	20 Apr 17		Time:	0650		
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	8.72	7.02	7.00	6.95-7.05	-23.9	0 +/- 50
Buffer 10	9.01	10.05	10.00	9.95-10.05	-198.7	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	9.31	10,134	10,008	±10%	Buffer 5000	4998
<b>ORP</b>						
231 mV @ 25C	8.37	258.0	250.5	±10 mV		
<b>DO</b>						
	7.52	111.0%	94.3%	Barometric Pressure (mm Hg)		
				mg/L	716.34	

Post Site Check		
Time:	1630	
<b>pH</b>	Temp °C	Reading
Buffer 7	20.53	7.00
<b>Conductivity</b>		
Buffer 5000	20.00	4989

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: \_\_\_\_\_

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date: _____		Time: _____				
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<input type="text"/>	<input type="text"/>	<input type="text"/>	6.95-7.05	<input type="text"/>	0 +/- 50
Buffer 10	<input type="text"/>	<input type="text"/>	<input type="text"/>	9.95-10.05	<input type="text"/>	-180 +/- 50
<b>Conductivity</b>					Check	
Buffer 10000	<input type="text"/>	<input type="text"/>	<input type="text"/>	±10%	Buffer 5000	<input type="text"/>
<b>ORP</b>						
231 mV @ 25C	<input type="text"/>	<input type="text"/>	<input type="text"/>	±10 mV		
<b>DO</b>					Barometric Pressure (mm Hg)	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	mg/L	<input type="text"/>	

Post Site Check		
Time: _____		
<b>pH</b>	Temp °C	Reading
Buffer 7	<input type="text"/>	<input type="text"/>
<b>Conductivity</b>		
Buffer 5000	<input type="text"/>	<input type="text"/>

Pre Site Calibration						
Date: _____		Time: _____				
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<input type="text"/>	<input type="text"/>	<input type="text"/>	6.95-7.05	<input type="text"/>	0 +/- 50
Buffer 10	<input type="text"/>	<input type="text"/>	<input type="text"/>	9.95-10.05	<input type="text"/>	-180 +/- 50
<b>Conductivity</b>					Check	
Buffer 10000	<input type="text"/>	<input type="text"/>	<input type="text"/>	±10%	Buffer 5000	<input type="text"/>
<b>ORP</b>						
231 mV @ 25C	<input type="text"/>	<input type="text"/>	<input type="text"/>	±10 mV		
<b>DO</b>					Barometric Pressure (mm Hg)	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	mg/L	<input type="text"/>	

Post Site Check		
Time: _____		
<b>pH</b>	Temp °C	Reading
Buffer 7	<input type="text"/>	<input type="text"/>
<b>Conductivity</b>		
Buffer 5000	<input type="text"/>	<input type="text"/>





# Laboratories, Inc.

2616 E. Broadway  
Bismarck, ND 58501  
Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-0999
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Jeremy Meyer Darren Nieswag

Sample Information					Bottle Type				Field Parameters			Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	1 liter Nitric					Temp (°C)	Spec. Cond.	pH	Analysis Required
W1158	FB2	20 Apr 17	—	GW	4					—	—	—	* Rad 226 & Rad 228
W1159	Dy 2	20 Apr 17	—	GW	4					—	—	—	
<del>W1160</del>	<del>2-90</del>	<del>20 Apr 17</del>	<del>1525</del>	<del>GW</del>	<del>4</del>					<del>8.66</del>	<del>7797</del>	<del>6.90</del>	
W1161	3-90	20 Apr 17	1405	GW	4					8.07	4851	6.89	
W1162	33	20 Apr 17	1240	GW	4					8.76	4998	6.59	
W1163	44R	20 Apr 17	0743	GW	4					7.93	9045	6.60	
W1164	80R	20 Apr 17	1055	GW	4					7.48	5747	7.12	
W1165	105	20 Apr 17	0925	GW	4					7.36	7168	6.75	

Comments: \* Lab accident. Sample will be recollected at a later date. cc 25 Apr 17

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1	21 Apr 17 0740	Log In Walk In #2	15.5 TM562 / TM588
2			

Received by:	
Name:	Date/Time
	21 Apr 17 800



CASE NARRATIVE – AMENDED 6 JUL 17 (Work Order)

MVTL Lab Reference No/SDG: 201782-1038
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR April 2017
MVTL Laboratory Identifications: 17-W1259
Page 1 of 1

Table with 2 columns: MDU Sample Identification (2-90) and MVTL Laboratory # (17-W1259)

I. RECEIPT

- All samples were received at the laboratory on 26 Apr17 at 1344.
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 7.4°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.
Methods 6010D and Method 6020B were used to analyze the metals.

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 the selenium 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.

V. REPORTING

- Per email dated 31 May 17 from Terri Olson at Barr, the QC report was amended to include the MS source ID, MS data, MS/MSD percent recoveries for molybdenum.
On 6 Jul 17, it was discovered that the template used to create the case narrative had an extra 7 in the work order (e.g. 2017782-1038). Case narrative has been corrected to reflect the correct work order.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7 JUL 17
Claudette Carroll - MVTL Bismarck Laboratory Manager

## Claudette Carroll

---

**From:** Terri A. Olson <TOlson@barr.com>  
**Sent:** Wednesday, May 31, 2017 9:04 PM  
**To:** Claudette Carroll  
**Subject:** RE: Emailing - 201782-1038 MDU HESK CCR APR 17.pdf

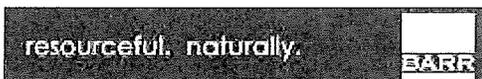
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Claudette,

This lab report is missing the MS source IDs, MS data, MS % recoveries, and the MSD % recoveries for Mo.

Thank-you,

Terri A. Olson  
Senior Data Quality Specialist  
Minneapolis, MN office: 952.842.3578  
[TOlson@barr.com](mailto:TOlson@barr.com)  
[www.barr.com](http://www.barr.com)



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**From:** Claudette Carroll [mailto:[ccarroll@mvtl.com](mailto:ccarroll@mvtl.com)]  
**Sent:** Tuesday, May 23, 2017 3:01 PM  
**To:** Barr Data Management <[BarrDM@barr.com](mailto:BarrDM@barr.com)>; Jesse Hedlund <[jhedlund@mvtl.com](mailto:jhedlund@mvtl.com)>; Julie Crispin <[jcrispin@mvtl.com](mailto:jcrispin@mvtl.com)>; Marshall, Samantha <[Samantha.Marshall@mdu.com](mailto:Samantha.Marshall@mdu.com)>; Mary Hames <[mhames@mvtl.com](mailto:mhames@mvtl.com)>; Steve Bowen <[sbowen@mvtl.com](mailto:sbowen@mvtl.com)>; Terri A. Olson <[TOlson@barr.com](mailto:TOlson@barr.com)>; Tonia D. O'Brien <[tobrien@barr.com](mailto:tobrien@barr.com)>  
**Subject:** Emailing - 201782-1038 MDU HESK CCR APR 17.pdf

Good afternoon,

Attached is a data package for the last sample from the April 2017 sampling done at MDU Heskett. Hard copies to follow to Sam and EDDs to follow from our IT department.

Have a good rest of your day!  
Claudette



**Minnesota Valley Testing  
Laboratories, Inc.**  
*Providing Analytical Excellence Since 1951*

[ccarroll@mvtl.com](mailto:ccarroll@mvtl.com)  
701-258-9720



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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 2616 E. Broadway Ave. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724  
 1201 Lincoln Highway ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885  
 www.mvtl.com

MEMBER  
ACIL

Page: 1 of 2

## Quality Control Report – Amended 7 Jun 17

Lab ID: 17-W1259

Project: MDU Heskett - CCR

Work Order: 201782-1038

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 - Total mg/l	0.1000	106	80-120	0.100	17-W1259D	< 0.001	0.1178	118	75-125	0.1178	0.1194	119	1.3	20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	105	80-120	0.100	17-W1259D	< 0.002	0.1159	116	75-125	0.1159	0.1177	118	1.5	20	-	-	< 0.002
Barium - Total mg/l	0.1000	102	80-120	0.100	17-W1259D	0.0100	0.1163	106	75-125	0.1163	0.1192	109	2.5	20	-	-	< 0.002
Beryllium - Total mg/l	0.1000	108	80-120	0.100	17-W1259D	< 0.0005	0.1136	114	75-125	0.1136	0.1158	116	1.9	20	-	-	< 0.0005
Boron - Total mg/l	0.40	102	80-120	0.400 0.400	17-W1092 17-W1199	< 0.1 3.97	0.40 4.33	100 90	75-125 75-125	0.40 4.33	0.40 4.33	100 90	0.0 0.0	20 20	- -	- -	< 0.1 < 0.1
Cadmium - Total mg/l	0.1000	109	80-120	0.100	17-W1259D	< 0.0005	0.1120	112	75-125	0.1120	0.1128	113	0.7	20	-	-	< 0.0005
Calcium - Total mg/l	20.0	111	80-120	500	17W1256q	450	975	105	75-125	975	955	101	2.1	20	- -	- -	< 1 < 1
Chloride mg/l	30.0 30.0	82 81	80-120 80-120	30.0	17-W1257	< 1	24.9	83	80-120	24.9	27.0	90	8.1	20	- -	- -	< 1 < 1
Chromium - Total mg/l	0.1000	104	80-120	0.100	17-W1259D	< 0.002	0.1108	111	75-125	0.1108	0.1136	114	2.5	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	102	80-120	0.100	17-W1259D	< 0.002	0.1096	110	75-125	0.1096	0.1110	111	1.3	20	-	-	< 0.002
Fluoride mg/l	0.50 0.50	104 106	90-110 90-110	0.500	17-W1268	1.11	1.61	100	80-120	1.61	1.61	100	0.0	20	- -	- -	< 0.1 < 0.1
Lead - Total mg/l	0.1000	102	80-120	0.100	17-W1259D	< 0.0005	0.1036	104	75-125	0.1036	0.1048	105	1.2	20	-	-	< 0.0005



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MEMBER  
ACIL

## Quality Control Report – Amended 7 Jun 17

Lab ID: 17-W1259

Project: MDU Heskett - CCR

Work Order: 201782-1038

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
Lithium - Total mg/l	0.40	105	80-120	0.400	17-W1319	0.06	0.50	110	75-125	0.50	0.50	110	0.0	20	-	-	< 0.1 < 0.1
Mercury - Total mg/l	0.0020	100	85-115	0.002 0.002	17-W1259 17-W1278	< 0.0002 < 0.0002	0.0020 0.0019	100 95	70-130 70-130	0.0020 0.0019	0.0019 0.0019	95 95	5.1 0.0	20 20	- -	- -	< 0.0002
Molybdenum - Total mg/l	0.1000	87	80-120	0.100	17-W1259Q	<0.002	0.1090	109	75-125	0.1090	0.1100	110	0.9	20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	7.0 7.8	7.0 7.8	- -	0.0 0.0	20 20	- -	- -	- -
Selenium - Total mg/l	0.1000	112	80-120	0.100	17-W1259D	0.1609	0.2956	135	75-125	0.2956	0.3013	140	1.9	20	-	-	< 0.002
Sulfate mg/l	100	83	80-120	1000	17-W1283	160	1020	86	80-120	1020	1010	85	1.0	20	-	-	< 5
Thallium - Total mg/l	0.1000	101	80-120	0.100	17-W1259D	< 0.0005	0.1019	102	75-125	0.1019	0.1036	104	1.7	20	-	-	< 0.0005
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1200 2470	1070 2460	- -	11.5 0.4	20 20	- -	- -	< 10 < 10

Approved by: \_\_\_\_\_

*C. Cantel*  
7 Jun 17



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890  
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Page: 1 of 1

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 22 May 17  
 Lab Number: 17-W1259  
 Work Order #: 82-1038  
 Account #: 002800  
 Date Sampled: 26 Apr 17 12:00  
 Date Received: 26 Apr 17 13:44  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 2-90

Temp at Receipt: 7.4C ROI

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	26 Apr 17	CC
pH - Field	6.91	units	NA	SM 4500 H+ B	26 Apr 17 12:00	DJN
pH	* 7.0	units	0.1	SM4500 H+ B	27 Apr 17 17:00	SVS
Temperature - Field	7.91	Degrees C	NA	SM 2550B	26 Apr 17 12:00	DJN
Conductivity - Field	7790	umhos/cm	1	EPA 120.1	26 Apr 17 12:00	DJN
Fluoride	1.02	mg/l	0.10	SM4500-F-C	27 Apr 17 17:00	SVS
Sulfate	4080	mg/l	5.00	ASTM D516-07	12 May 17 15:42	EMS
Chloride	78.0	mg/l	1.0	SM4500-Cl-E	4 May 17 16:08	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	2 May 17 12:53	EV
Total Dissolved Solids	7340	mg/l	10	I1750-85	28 Apr 17 13:42	SVS
Calcium - Total	500	mg/l	1.0	6010	1 May 17 16:05	SZ
Lithium - Total	1.14	mg/l	0.10	6010	5 May 17 15:19	KMD
Boron - Total	0.40	mg/l	0.10	6010	4 May 17 13:21	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	16 May 17 18:04	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	16 May 17 18:04	CC
Barium - Total	0.0103	mg/l	0.0020	6020	16 May 17 18:04	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	16 May 17 18:04	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	16 May 17 18:04	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	16 May 17 18:04	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	16 May 17 18:04	CC
Lead - Total	0.0006	mg/l	0.0005	6020	16 May 17 18:04	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	17 May 17 10:25	CC
Selenium - Total	0.1582	mg/l	0.0020	6020	16 May 17 18:04	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	16 May 17 18:04	CC

\* Holding time exceeded

Approved by:

*Claudette K Carroll* <sup>CC</sup> 23 May 17

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

CERTIFICATION: ND # ND-00016

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Darren Pieswaag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

**Pre Site Calibration**

Date: 26 Apr 17 Time: 1045

	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7		<u>19.53</u>	<u>6.96</u>	<u>7.00</u>	6.95-7.05	<u>-20.0</u>	0 +/- 50
Buffer 10		<u>19.59</u>	<u>10.02</u>	<u>10.00</u>	9.95-10.05	<u>-194.5</u>	-180 +/- 50
<b>Conductivity</b>							Check
Buffer 10000		<u>18.71</u>	<del><u>18.71</u></del> <u>9820</u>	<u>10005</u>	±10%	Buffer 5000	<u>4974</u>
<b>ORP</b>							
231 mV @ 25C		<u>8.73</u>	<u>230.8</u>	<u>231.0</u>	±10 mV		
<b>DO</b>							
		<u>14.46</u>	<u>10.43</u>	<u>9.52</u>	Barometric Pressure (mm Hg)	<u>713.1</u>	mg/L

Date: \_\_\_\_\_ Time: \_\_\_\_\_

	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7					6.95-7.05		0 +/- 50
Buffer 10					9.95-10.05		-180 +/- 50
<b>Conductivity</b>							Check
Buffer 10000					±10%	Buffer 5000	
<b>ORP</b>							
231 mV @ 25C					±10 mV		
<b>DO</b>							
					Barometric Pressure (mm Hg)		mg/L

**Post Site Check**

Time: 1338

	pH	Temp °C	Reading
Buffer 7		<u>19.02</u>	<u>6.99</u>
<b>Conductivity</b>			
Buffer 5000		<u>18.79</u>	<u>4961</u>

Time: \_\_\_\_\_

	pH	Temp °C	Reading
Buffer 7			
<b>Conductivity</b>			
Buffer 5000			



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 2-90  
Sampling Personal: Parren Nieswaag

Weather Conditions: Temp: 40 °F Wind: N 10-15 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>20.36</u>	ft	
Total Well Depth:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:		ft	
Water Level After Sample:		ft	
Measurement Method:	<u>Electric Water Level Indicator</u>		

### Sampling Information

Purging Method:	<u>Bladder</u>		Control Settings	
Sampling Method:	<u>Bladder</u>		Purge:	<u>5</u> sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Recover:	<u>10</u> sec.
Duplicate Sample?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>26 Apr 17</u>	Time Purging Began:	<u>1140</u>	<u>am/pm</u>
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Time Purged Dry:	<u>—</u> am/pm
Sample Date:	<u>26 Apr 17</u>	Time of Sampling:	<u>1200</u>	<u>am/pm</u>
Bottle List:	<u>CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric</u>			

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1145	7.72	7828	6.91	3.24	59.1	0.132	20.60	500	<u>clear</u>
2	1150	7.54	7822	6.91	3.18	57.9	0.118	20.60	500	<u>clear</u>
3	1155	7.77	7834	6.91	3.07	56.3	0.12	20.68	500	<u>clear</u>
4	1200	7.91	7790	6.91	3.12	55.6	0.118	20.68	500	<u>clear</u>
5										
6										
7										
8										
9										
10										

Stabilized: Yes  No   
Comments: —

Total Volume Removed: 2000 mL



# Laboratories, Inc.

2616 E. Broadway  
Bismarck, ND 58501  
Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> MDU Heskett	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-1038
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> Darrin Nesnaag

Lab Number	Sample ID	Sample Information			Bottle Type			Field Parameters			Analysis Required	
		Date	Time	Sample Type	1 liter	500mL Nitric	500mL Nitric (filtered)	Temp (°C)	Spec. Cond.	pH		
W1259	2-90	26 Apr 17	1200	GW	X	X	X	7.21	7790	6.91	MDU CCR List with TSS and Dissolved CCR Metals.	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darrin Nesnaag</i>	26 Apr 17	Log In	RO2 7.4
2	1344	Walk In #2	TM562/ TM588

Received by:	
Name:	Date/Time
<i>Tina [Signature]</i>	26 Apr 2017
	1344



**CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 201782-1039  
**IML Lab Reference No/SDG:** S1705014  
**Client:** Montana Dakota Utilities  
**Location:** MDU Heskett Ash Site  
**Project Identification:** CCR April 2017  
**MVTL Laboratory Identifications:** 17-W1260  
**IML Laboratory Identifications:** S1705014-001  
**Page 1 of 2**

MDU Sample Identification	MVTL Laboratory #	IML Laboratory #
2-90	17-W1260	S1705014-001

**I. RECEIPT**

- All samples were received at the laboratory on 26 Apr 2017 at 1344.
- 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 7.4°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 1 May 2017.
  - 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.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-1039  
IML Lab Reference No/SDG: S1705014  
Client: Montana Dakota Utilities  
Location: MDU Heskett Ash Site  
Project Identification: CCR April 2017  
MVTL Laboratory Identifications: 17-W1260  
IML Laboratory Identifications: S1705014-001  
Page 2 of 2

V. REPORTING

- Per email from Barr Engineering dated 10 March 2016, IML was directed to report numerical values, including negative results for both the sample results and the method analyte precision.
- Per email from Samantha Marshall with MDU, MVTL was directed to report the radium 226 and radium 228 values individually and then MDU would calculate the summation result using their database tabulations.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 26 May 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



# 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



Page: 1 of 1

Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 26 May 17  
Lab Number: 17-W1260  
Work Order #: 82-1039  
Account #: 002800  
Date Sampled: 26 Apr 17 12:00  
Date Received: 26 Apr 17 13:44  
Sampled By: MVTl Field Services

Project Name: MDU Heskett  
Sample Description: 2-90

Temp at Receipt: 7.4C ROI

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.91 units	NA	SM 4500 H+ B	26 Apr 17 12:00	DJN
Temperature - Field	7.91 Degrees C	NA	SM 2550B	26 Apr 17 12:00	DJN
Conductivity - Field	7790 umhos/cm	1	EPA 120.1	26 Apr 17 12:00	DJN
Radium 226	See Attached Report			17 May 17	OL
Radium 228	See Attached Report			10 May 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*cc*  
Claudette K. Carroll 26 May 17

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

CERTIFICATION: ND # ND-00016



Date: 5/19/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782-1039  
**Lab Order:** S1705014

**CASE NARRATIVE**  
**Report ID:** S1705014001

Sample 17-W1260 2-90 was received on May 1, 2017.

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



### Sample Analysis Report

**Company:** MVTL Laboratories, Inc.  
2616 E Broadway Ave.  
Bismarck, ND 58501

**Date Reported** 5/19/2017  
**Report ID** S1705014001

**ProjectName:** 201782-1039  
**Lab ID:** S1705014-001  
**ClientSample ID:** 17-W1260 2-90  
**COC:** 201782-1039

**WorkOrder:** S1705014  
**CollectionDate:** 4/26/2017 12:00:00 PM  
**DateReceived:** 5/1/2017 10:27:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
----------	--------	-------	------	----	--------	--------------------

#### Radionuclides - Total

Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	05/17/2017 1029 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/17/2017 1029 MB
Radium 228	0.0	pCi/L		1	Ga-Tech	05/10/2017 1926 MB
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	05/10/2017 1926 MB

These results apply only to the samples tested.

#### RL - Reporting Limit

**Qualifiers:**

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

- C Calculated Value
- G Analyzed at IML Gillette laboratory
- J Analyte detected below quantitation limits
- M Value exceeds Monthly Ave or MCL or is less than LCL
- O Outside the Range of Dilutions
- X Matrix Effect

Reviewed by: Wade Nieuwsma  
Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.  
Work Order: S1705014  
Project: 201782-1039

Date: 5/19/2017  
Report ID: S1705014001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-433 (05/09/17 09:45)	Analyte	RunNo:	145731	PrepDate:	05/03/17 12:00	BatchID	13157		
		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-433 (05/09/17 12:49)	Analyte	RunNo:	145731	PrepDate:	05/03/17 12:00	BatchID	13157		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		41	1	40.1		103	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-433 (05/09/17 18:56)	Analyte	RunNo:	145731	PrepDate:	05/03/17 12:00	BatchID	13157		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		42	1	40.1	ND	106	65.9 - 132		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-433 (05/09/17 22:00)	Analyte	RunNo:	145731	PrepDate:	05/03/17 12:00	BatchID	13157		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		45	1	42	5.31	111	20		

Radium 226 in Water -		Sample Type	MBLK		Units: pCi/L				
MB-1749 (05/17/17 10:29)	Analyte	RunNo:	145882	PrepDate:	05/08/17 0:00	BatchID	13173		
		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-1749 (05/17/17 10:29)	Analyte	RunNo:	145882	PrepDate:	05/08/17 0:00	BatchID	13173		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		6.4	0.2	6.41		100	67.1 - 122		

Radium 226 in Water -		Sample Type	LCSD		Units: pCi/L				
LCSD-1749 (05/17/17 10:29)	Analyte	RunNo:	145882	PrepDate:	05/08/17 0:00	BatchID	13173		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		5.8	0.2	6.4	10.7	90.2	20		

Radium 226 in Water -		Sample Type	MS		Units: pCi/L				
S1705059-003AMS (05/17/17 16:21)	Analyte	RunNo:	145882	PrepDate:	05/08/17 0:00	BatchID	13173		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		12.7	0.2	12.8	0.3	97.1	65 - 131		

Radium 226 in Water -		Sample Type	MSD		Units: pCi/L				
S1705059-003AMSD (05/17/17 16:21)	Analyte	RunNo:	145882	PrepDate:	05/08/17 0:00	BatchID	13173		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		12.3	0.2	12.7	3.49	93.7	20		

- Qualifiers:**
- B 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
  - 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

Phone: (701) 258-9720  
 Toll Free: (800) 279-6885 Fax: (701) 258-9724

201782-1039

Company Name and Address:  <u>MVTL</u> <u>2616 E Broadway</u> <u>Bismarck, ND 58501</u>	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  <u>PO Box 249</u> <u>New Ulm, MN 56073</u>	Name of Sampler:	E-mail: <u>ccarroll@mvtl.com</u> For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 27-Apr-17
	Project Name/Number:	Purchase Order #: BL5849

Sample Information						Bottle Type					Analysis	
IML Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials	Impreserved	Glass Jar	Other	Analysis Required
S1705014 001	17-W1260	2-90	GW	26-Apr-17	1200		4					Ra226 & Ra228

Comments: All results must be reported as a numerical value.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
A. Simonson	27-Apr-17	1700		Kathy Boy	5.1.17	10:27 12.2°C
2.						

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Darren Kjesnaag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102066

**Pre Site Calibration**

Date: 26 Apr 17 Time: 1045

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
<b>pH</b>						
Buffer 7	19.53	6.96	7.00	6.95-7.05	-20.0	0 +/- 50
Buffer 10	19.59	10.02	10.00	9.95-10.05	-194.5	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	18.71	<del>18.71</del> 9820	10005	±10%	Buffer 5000	4974
<b>ORP</b>						
231 mV @ 25C	8.73	230.8	231.0	±10 mV		
<b>DO</b>						
	14.46	10.43	9.52	Barometric Pressure (mm Hg)	713.1	mg/L

Date: \_\_\_\_\_ Time: \_\_\_\_\_

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
<b>pH</b>						
Buffer 7				6.95-7.05		0 +/- 50
Buffer 10				9.95-10.05		-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000				±10%	Buffer 5000	
<b>ORP</b>						
231 mV @ 25C				±10 mV		
<b>DO</b>						
				Barometric Pressure (mm Hg)		mg/L

**Post Site Check**

Time: 1338

	Temp °C	Reading
<b>pH</b>		
Buffer 7	19.02	6.99
<b>Conductivity</b>		
Buffer 5000	18.79	4961

Time: \_\_\_\_\_

	Temp °C	Reading
<b>pH</b>		
Buffer 7		
<b>Conductivity</b>		
Buffer 5000		



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Heskett  
Event: 2017  
Sample ID: 2-90  
Sampling Personal: Parren Niemi

Weather Conditions: Temp: 46 °F Wind: N10-15 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	20.36		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	ft		
Water Level After Sample:	ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	70 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	—
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	26 Apr 17	Time Purging Began:	1140	am/pm
Well Purged Dry?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	26 Apr 17	Time of Sampling:	1200	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

### Field Measurements

SEQ #	Time	Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
1	1145		7.72	7828	6.91	3.24	59.4	0.132	20.60	500	clear
2	1150		7.54	7822	6.91	3.18	57.9	0.18	20.60	500	clear
3	1155		7.77	7834	6.91	3.04	56.3	0.12	20.68	500	clear
4	1200		7.91	7790	6.91	3.12	55.6	0.18	20.68	500	clear
5											
6											
7											
8											
9											
10											

Stabilized: Yes  No   
Comments:   

Total Volume Removed: 2000 mL

**Laboratories, Inc.**2616 E. Broadway  
Bismarck, ND 58501  
Phone (701) 258-9720

# Chain of Custody Record

<b>Project Name:</b> <b>MDU Heskett</b>	<b>Event:</b> <b>April 2017</b>	<b>Work Order Number:</b> <b>82-1039</b>
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	<b>Carbon Copy:</b> Attn: Address:	<b>Name of Sampler(s):</b> <i>Darren Nieswaas</i>

Sample Information					Bottle Type				Field Parameters			Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	1 liter Nitric				Temp (°C)	Spec. Cond.	pH	Analysis Required	
<i>W1260</i>	<i>2-90</i>	<i>26 Apr 17</i>	<i>1200</i>	<i>GW</i>	<i>4</i>				<i>7.91</i>	<i>7790</i>	<i>6.91</i>	Rad 226 & Rad 228	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
<i>Darren Nieswaas</i>	<i>26 Apr 17</i> <i>1344</i>	<i>Log In</i> Walk In #2	<i>ROZ 7.4</i> TM562 / TM588
1			
2			

Received by:	
Name:	Date/Time
<i>Teri Ch...</i>	<i>26 Apr 2017</i> <i>1344</i>



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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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.mvttl.com



June 2, 2017

Montana Dakota Utilities  
Attn: Samantha Marshall  
400 N. 4<sup>th</sup> St.  
Bismarck, ND 58501

RE: Wells 104 and 105 - MDU Heskett Ash Site

Dear Ms. Marshall:

On May 25, 2017, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule.

Samples were collected from wells 104 and 105. A duplicate sample was collected from well 105. The samples collected were placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis.

Thank you for your trust and support of our services. If you have any questions, please call me at (800) 279-6885.

Sincerely,

Jeremy Meyer  
MVTL Field Services



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
Event: 2017  
Sample ID: 104  
Sampling Personal: Jerry Meyer

Weather Conditions: Temp: 50 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <del>No</del>	
Well Labeled?	Yes No	
Casing Straight?	Yes No	
Grout Seal Intact?	Yes No	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	13.54	ft
Total Well Depth:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	13.85	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>5</u> sec.
Dedicated Equip?:	Yes No	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <del>No</del>	PSI: <u>15</u>
Duplicate Sample ID:	—	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>25 May 17</u>	Time Purging Began: <u>0820</u> am/pm
Well Purged Dry?:	Yes <del>No</del>	Time Purged Dry: <u>—</u> am/pm
Sample Date:	<u>25 May 17</u>	Time of Sampling: <u>0845</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
										SEQ #
1	0825	10.03	13781	6.89	9.04	261.7	3.87	13.85	500.0	Clear
2	0830	9.93	13914	6.84	9.64	264.7	2.15	13.85	500.0	Clear
3	0835	9.85	13918	6.83	9.81	265.7	1.66	13.87	500.0	Clear
4	0840	9.78	13928	6.82	10.13	264.4	1.27	13.95	500.0	Clear
5	0845	9.82	13896	6.83	10.26	264.0	1.10	13.88	500.0	Clear
6										
7										
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 2500.0 mL



2616 E. Broadway Ave. Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Groundwater Assessment

Company: MDU Heskett  
 Event: 2017  
 Sample ID: 105  
 Sampling Personal: Jeery Meyer

Weather Conditions: Temp: 60 °F Wind: S @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Casing Straight?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Grout Seal Intact?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	12.46	ft
Total Well Depth:	—	ft
Well Volume:	—	liters
Depth to Top of Pump:	—	ft
Water Level After Sample:	12.72	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>5</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: <u>25</u>
Duplicate Sample ID:	Dup 1	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>25 May 17</u>	Time Purging Began: <u>0938</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: <u>—</u> am/pm
Sample Date:	<u>25 May 17</u>	Time of Sampling: <u>1013</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
1	0943	8.97	5951	6.65	8.61	231.4	7.79	12.66	500.0	Clear
2	0948	8.82	5877	6.64	7.32	228.7	7.84	12.68	500.0	Clear
3	0953	8.64	5977	6.64	5.41	226.7	6.32	12.69	500.0	Clear
4	0958	8.76	6469	6.64	6.28	220.9	4.54	12.83	500.0	Clear
5	1003	8.68	6695	6.62	6.09	218.0	4.80	12.84	500.0	Clear
6	1008	8.92	6875	6.62	5.92	216.2	5.08	12.85	500.0	Clear
7	1013	9.16	6998	6.62	6.11	213.3	4.88	12.83	500.0	Clear
8										
9										
10										

Stabilized: Yes  No   
 Comments:

Total Volume Removed: 3500.0 mL

# MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Jerry

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	25 May 17		Time:	0810		
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	15.18	7.04	7.00	6.95-7.05	-24.7	0 +/- 50
Buffer 10	15.46	9.98	10.00	9.95-10.05	-200.8	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000	14.89	9998	10000	±10%	Buffer 5000	4954
<b>ORP</b>						
231 mV @ 25C	15.40	242.4	244.0	±10 mV		
<b>DO</b>						
	14.43	130.1%	99.2%	Barometric Pressure (mm Hg)		
				mg/L	754.00	

Post Site Check		
Time:	1030	
<b>pH</b>	Temp °C	Reading
Buffer 7	16.01	7.01
<b>Conductivity</b>		
Buffer 5000	15.31	5034

Date:			Time:			
<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7				6.95-7.05		0 +/- 50
Buffer 10				9.95-10.05		-180 +/- 50
<b>Conductivity</b>						Check
Buffer 10000				±10%	Buffer 5000	
<b>ORP</b>						
231 mV @ 25C				±10 mV		
<b>DO</b>						
				Barometric Pressure (mm Hg)		
				mg/L		

Time:		
<b>pH</b>	Temp °C	Reading
Buffer 7		
<b>Conductivity</b>		
Buffer 5000		



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-1382
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR May 2017
MVTL Laboratory Identifications: 17-W2011 through 17-W2014
Page 1 of 1

Table with 2 columns: MDU Sample Identification, MVTL Laboratory #. Rows include 104, 105, Dup1, FB and their corresponding lab numbers.

I. RECEIPT

- All samples were received at the laboratory on 25 May 17 at 1340.
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 8.7°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.
Methods 6010D and Method 6020B were used to analyze the metals.

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.
For some analytes, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
One lithium matrix spike duplicate recovery was outside the acceptable limits. Recovery for the matrix spike was acceptable. RPD for the recoveries of the matrix spike duplicate and the matrix spike was within limits. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 13 Jun 17
Claudette Carroll - MVTL Bismarck Laboratory Manager

**Quality Control Report**

Lab IDs: 17-W2011 to 17-W2014

Project: MDU Heskett - CCR

Work Order: 201782-1382

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 - Total mg/l	0.1000	109	80-120	0.400	17W2013q	< 0.001	0.4300	108	75-125	0.4300	0.4312	108	0.3	20	-	-	< 0.001
				0.400	17W2022q	< 0.001	0.4316	108	75-125	0.4316	0.4664	117	7.8	20	-	-	
				0.400	17W2025q	< 0.001	0.4176	104	75-125	0.4176	0.4192	105	0.4	20	-	-	
Arsenic - Total mg/l	0.1000	104	80-120	0.400	17W2013q	< 0.002	0.4258	106	75-125	0.4258	0.4334	108	1.8	20	-	-	< 0.002
				0.400	17W2022q	0.0024	0.4398	109	75-125	0.4398	0.4662	116	5.8	20	-	-	
				0.400	17W2025q	< 0.002	0.4168	104	75-125	0.4168	0.4208	105	1.0	20	-	-	
Barium - Total mg/l	0.1000	103	80-120	0.400	17W2013q	0.0208	0.3920	93	75-125	0.3920	0.4154	99	5.8	20	-	-	< 0.002
				0.400	17W2022q	0.0613	0.4506	97	75-125	0.4506	0.4830	105	6.9	20	-	-	
				0.400	17W2025q	0.0404	0.4484	102	75-125	0.4484	0.4252	96	5.3	20	-	-	
Beryllium - Total mg/l	0.1000	115	80-120	0.400	17W2013q	< 0.0005	0.4542	114	75-125	0.4542	0.4654	116	2.4	20	-	-	< 0.0005
				0.400	17W2022q	< 0.0005	0.4678	117	75-125	0.4678	0.4924	123	5.1	20	-	-	
				0.400	17W2025q	< 0.0005	0.4720	118	75-125	0.4720	0.4548	114	3.7	20	-	-	
Boron - Total mg/l	0.40 0.40	98 100	80-120 80-120	0.400	17-M1275	8.52	8.86	85	75-125						-	-	< 0.1
				0.400	17-W1872	0.19	0.55	90	75-125	0.55	0.57	95	3.6	20	-	-	< 0.1
				15.0	17-W1888	29.0	44.4	103	75-125	44.4	43.8	99	1.4	20	-	-	< 0.1
				0.400	17-W2013	0.38	0.73	88	75-125	0.73	0.73	88	0.0	20	-	-	
				0.400	17-W2022	0.58	0.95	92	75-125	0.95	0.96	95	1.0	20	-	-	
Cadmium - Total mg/l	0.1000	114	80-120	0.400	17W2013q	< 0.0005	0.4238	106	75-125	0.4238	0.4266	107	0.7	20	-	-	< 0.0005
				0.400	17W2022q	< 0.0005	0.4500	112	75-125	0.4500	0.4784	120	6.1	20	-	-	
				0.400	17W2025q	< 0.0005	0.4346	109	75-125	0.4346	0.4260	106	2.0	20	-	-	
Calcium - Total mg/l	20.0 20.0	114 109	80-120 80-120	100	17W1994q	6.5	114	108	75-125	114	112	106	1.8	20	-	-	< 1
				500	17W2013q	410	910	100	75-125	910	975	113	6.9	20	-	-	< 1
				100	17W2025q	123	220	97	75-125	220	217	94	1.4	20	-	-	< 1
				100	17W2027q	6.0	111	105	75-125	111	110	104	0.9	20	-	-	< 1
Chloride mg/l	30.0 30.0	89 93	80-120 80-120	60.0	17-W1990	31.2	98.6	112	80-120	98.6	97.3	110	1.3	20	-	-	< 1
Chromium - Total mg/l	0.1000	101	80-120	0.400	17W2013q	< 0.002	0.3942	99	75-125	0.3942	0.3978	99	0.9	20	-	-	< 0.002
				0.400	17W2022q	< 0.002	0.4006	100	75-125	0.4006	0.4322	108	7.6	20	-	-	
				0.400	17W2025q	< 0.002	0.3888	97	75-125	0.3888	0.3944	99	1.4	20	-	-	



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 www.mvttl.com

MEMBER  
ACIL

**Quality Control Report**

Lab IDs: 17-W2011 to 17-W2014

Project: MDU Heskett - CCR

Work Order: 201782-1382

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	101	80-120	0.400	17W2013q	< 0.002	0.3878	97	75-125	0.3878	0.3886	97	0.2	20	-	-	< 0.002
				0.400	17W2022q	< 0.002	0.3988	100	75-125	0.3988	0.4322	108	8.0	20	-	-	-
				0.400	17W2025q	< 0.002	0.3852	96	75-125	0.3852	0.3888	97	0.9	20	-	-	-
Fluoride mg/l	0.50 0.50	94 100	90-110 90-110	0.500	17-W1990	3.17	3.69	104	80-120	3.69	3.67	100	0.5	20	-	-	< 0.1
				0.500	17-W1991	2.86	3.40	108	80-120	3.40	3.44	116	1.2	20	-	-	< 0.1
				0.500	17-W2022	0.13	0.62	98	80-120	0.62	0.62	98	0.0	20	-	-	< 0.1
Lead - Total mg/l	0.1000	103	80-120	0.400	17W2013q	< 0.0005	0.3674	92	75-125	0.3674	0.3916	98	6.4	20	-	-	< 0.0005
				0.400	17W2022q	< 0.0005	0.3914	98	75-125	0.3914	0.4206	105	7.2	20	-	-	-
				0.400	17W2025q	< 0.0005	0.4180	104	75-125	0.4180	0.3938	98	6.0	20	-	-	-
Lithium - Total mg/l	0.40	115	80-120	0.400	17-W2013	1.05	1.54	122	75-125	1.54	1.56	128	1.3	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Mercury - Total mg/l	0.0020	100	85-115	0.002	17-W1998	< 0.0002	0.0019	95	70-130	0.0019	0.0019	95	0.0	20	-	-	< 0.0002
				0.002	17-W2043	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	-
Molybdenum - Total mg/l	0.1000	110	80-120	0.400	17W2013q	< 0.002	0.4296	107	75-125	0.4296	0.4442	111	3.3	20	-	-	< 0.002
				0.400	17W2022q	< 0.002	0.4342	109	75-125	0.4342	0.4600	115	5.8	20	-	-	-
				0.400	17W2025q	< 0.002	0.4374	109	75-125	0.4374	0.4188	105	4.3	20	-	-	-
pH units	-	-	-	-	-	-	-	-	-	9.1	9.1	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	8.1	7.9	-	2.5	20	-	-	-
	-	-	-	-	-	-	-	-	-	8.8	8.9	-	1.1	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.3	7.5	-	2.7	20	-	-	-

**Quality Control Report**

Lab IDs: 17-W2011 to 17-W2014

Project: MDU Heskett - CCR

Work Order: 201782-1382

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 - Total mg/l	0.1000	117	80-120	0.400	17W2013q	< 0.005	0.4822	121	75-125	0.4822	0.4676	117	3.1	20	-	-	< 0.002
				0.400	17W2022q	< 0.005	0.4720	118	75-125	0.4720	0.4872	122	3.2	20	-	-	
				0.400	17W2025q	< 0.005	0.4786	120	75-125	0.4786	0.4490	112	6.4	20	-	-	
Sulfate mg/l	100	117	80-120	100	17-W1999	< 5	118	118	80-120	118	116	116	1.7	20	-	-	< 5
				100	17-W2014	1.60	121	119	80-120	121	121	119	0.0	20	-	-	< 5
Thallium - Total mg/l	0.1000	104	80-120	0.400	17W2013q	< 0.0005	0.3692	92	75-125	0.3692	0.3924	98	6.1	20	-	-	< 0.0005
				0.400	17W2022q	< 0.0005	0.3904	98	75-125	0.3904	0.4220	106	7.8	20	-	-	
				0.400	17W2025q	< 0.0005	0.4158	104	75-125	0.4158	0.4018	100	3.4	20	-	-	
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	6740	6770	-	0.4	20	-	-	< 10

Approved by: \_\_\_\_\_

*C. Gurep*

*13 Jun 17*



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Page: 1 of 4

## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 13 Jun 17  
 Lab Number: 17-W2011  
 Work Order #: 82-1382  
 Account #: 002800  
 Date Sampled: 25 May 17 8:45  
 Date Received: 25 May 17 13:40  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 104

Temp at Receipt: 8.7C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	25 May 17	SVS
pH - Field	6.83	units	NA	SM 4500 H+ B	25 May 17 8:45	JSM
pH	* 7.5	units	0.1	SM4500 H+ B	26 May 17 17:00	CC
Temperature - Field	9.82	Degrees C	NA	SM 2550B	25 May 17 8:45	JSM
Conductivity - Field	13896	umhos/cm	1	EPA 120.1	25 May 17 8:45	JSM
Fluoride	0.50	mg/l	0.10	SM4500-F-C	26 May 17 17:00	CC
Sulfate	12200	mg/l	5.00	ASTM D516-07	2 Jun 17 13:25	EMS
Chloride	111	mg/l	1.0	SM4500-Cl-E	9 Jun 17 8:22	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Jun 17 11:48	EV
Total Dissolved Solids	15200	mg/l	10	I1750-85	30 May 17 16:18	SVS
Calcium - Total	460	mg/l	1.0	6010	5 Jun 17 12:10	SZ
Lithium - Total	2.12	mg/l	0.10	6010	31 May 17 15:06	KMD
Boron - Total	0.94	mg/l	0.10	6010	1 Jun 17 10:48	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	8 Jun 17 14:25	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Barium - Total	0.0075	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Cobalt - Total	0.0023	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Selenium - Total	0.1598	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

13 Jun 17

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

CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 13 Jun 17  
 Lab Number: 17-W2012  
 Work Order #: 82-1382  
 Account #: 002800  
 Date Sampled: 25 May 17 10:13  
 Date Received: 25 May 17 13:40  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: 105

Temp at Receipt: 8.7C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	25 May 17	SVS
pH - Field	6.62	units	NA	SM 4500 H+ B	25 May 17 10:13	JSM
pH	* 7.3	units	0.1	SM4500 H+ B	26 May 17 18:00	CC
Temperature - Field	9.16	Degrees C	NA	SM 2550B	25 May 17 10:13	JSM
Conductivity - Field	6998	umhos/cm	1	EPA 120.1	25 May 17 10:13	JSM
Fluoride	0.25	mg/l	0.10	SM4500-F-C	26 May 17 18:00	CC
Sulfate	5160	mg/l	5.00	ASTM D516-07	2 Jun 17 13:25	EMS
Chloride	375	mg/l	1.0	SM4500-C1-E	9 Jun 17 8:22	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Jun 17 11:48	EV
Total Dissolved Solids	6520	mg/l	10	I1750-85	30 May 17 16:18	SVS
Calcium - Total	396	mg/l	1.0	6010	5 Jun 17 12:10	SZ
Lithium - Total	1.12	mg/l	0.10	6010	31 May 17 15:06	KMD
Boron - Total	0.37	mg/l	0.10	6010	1 Jun 17 10:48	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	8 Jun 17 14:25	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Barium - Total	0.0202	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD

\* Holding time exceeded

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

Approved by: Claudette K. Carroll *CC 13 Jun 17*

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

CERTIFICATION: ND # ND-00016



# 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



## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 13 Jun 17  
 Lab Number: 17-W2013  
 Work Order #: 82-1382  
 Account #: 002800  
 Date Sampled: 25 May 17  
 Date Received: 25 May 17 13:40  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: Dup 1

Temp at Receipt: 8.7C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	25 May 17	SVS
pH	* 7.3	units	0.1	SM4500 H+ B	26 May 17 18:00	CC
Fluoride	0.25	mg/l	0.10	SM4500-F-C	26 May 17 18:00	CC
Sulfate	4910	mg/l	5.00	ASTM D516-07	2 Jun 17 13:43	EMS
Chloride	378	mg/l	1.0	SM4500-CL-E	9 Jun 17 8:22	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Jun 17 11:48	EV
Total Dissolved Solids	6740	mg/l	10	I1750-85	30 May 17 16:18	SVS
Calcium - Total	410	mg/l	1.0	6010	5 Jun 17 12:10	SZ
Lithium - Total	1.05	mg/l	0.10	6010	31 May 17 15:06	KMD
Boron - Total	0.38	mg/l	0.10	6010	1 Jun 17 10:48	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	8 Jun 17 14:25	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Barium - Total	0.0208	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

CC  
13 Jun 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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## CERTIFICATE of ANALYSIS - CCR

Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 13 Jun 17  
 Lab Number: 17-W2014  
 Work Order #: 82-1382  
 Account #: 002800  
 Date Sampled: 25 May 17  
 Date Received: 25 May 17 13:40  
 Sampled By: MVTL Field Services

Project Name: MDU Heskett  
 Sample Description: FB

Temp at Receipt: 8.7C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	26 May 17	CS
pH	* 6.4	units	0.1	SM4500 H+ B	26 May 17 18:00	CC
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	26 May 17 18:00	CC
Sulfate	< 5	mg/l	5.00	ASTM D516-07	2 Jun 17 13:43	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	9 Jun 17 8:22	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Jun 17 11:48	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	30 May 17 16:18	SVS
Calcium - Total	< 1	mg/l	1.0	6010	5 Jun 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	31 May 17 15:06	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	1 Jun 17 10:48	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	8 Jun 17 14:25	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	8 Jun 17 14:25	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	8 Jun 17 14:25	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*CC  
13 Jun 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016