



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 110  
Sampling Personal: D. M. Neering

Weather Conditions: Temp: 32 °F Wind: N9 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	<u>Yes</u>	<u>No</u>	
Well Labeled?	<u>Yes</u>	No	
Casing Straight?	<u>Yes</u>	No	
Grout Seal Intact?	<u>Yes</u>	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	<u>8.74</u>	ft	
Total Well Depth:	<u>16.95</u>	ft	
Well Volume:	<u>5.1</u>	liters	
Depth to Top of Pump:	<u>13.50</u>	ft	
Water Level After Sample:	<u>8.89</u>	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings	
Sampling Method:	Bladder	Purge:	<u>5</u> sec.
Dedicated Equip?:	<u>Yes</u> No	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes <u>No</u>	PSI:	—
Duplicate Sample ID:	—	Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>11 Oct 16</u>	Time Purging Began:	<u>0837</u> am/pm
Well Purged Dry?	Yes <u>No</u>	Time Purged Dry:	— am/pm
Sample Date:	<u>11 Oct 16</u>	Time of Sampling:	<u>1002</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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.	
SEQ #	Time									
1	<u>0842</u>	<u>10.38</u>	<u>1105</u>	<u>7.28</u>	<u>5.83</u>	<u>177.6</u>	<u>33.6</u>	<u>8.89</u>	<u>500</u>	<u>cl</u>
2	<u>0857</u>	<u>9.38</u>	<u>1068</u>	<u>7.28</u>	<u>5.28</u>	<u>174.8</u>	<u>25.3</u>	<u>8.98</u>	<u>1500</u>	<u>cl</u>
3	<u>0912</u>	<u>9.63</u>	<u>1061</u>	<u>7.28</u>	<u>5.57</u>	<u>173.7</u>	<u>18.8</u>	<u>8.83</u>	<u>1500</u>	<u>cl</u>
4	<u>0927</u>	<u>10.30</u>	<u>1057</u>	<u>7.28</u>	<u>5.29</u>	<u>173.9</u>	<u>10.0</u>	<u>8.88</u>	<u>1500</u>	<u>cl</u>
5	<u>0942</u>	<u>9.37</u>	<u>1058</u>	<u>7.29</u>	<u>5.65</u>	<u>172.3</u>	<u>7.56</u>	<u>8.84</u>	<u>1500</u>	<u>cl</u>
6	<u>0952</u>	<u>9.48</u>	<u>1059</u>	<u>7.29</u>	<u>5.18</u>	<u>172.6</u>	<u>4.52</u>	<u>8.84</u>	<u>1500</u>	<u>cl</u>
7	<u>0957</u>	<u>9.52</u>	<u>1060</u>	<u>7.28</u>	<u>5.22</u>	<u>172.6</u>	<u>4.73</u>	<u>8.88</u>	<u>500</u>	<u>cl</u>
8	<u>1002</u>	<u>9.74</u>	<u>1058</u>	<u>7.27</u>	<u>5.47</u>	<u>172.1</u>	<u>4.69</u>	<u>8.85</u>	<u>500</u>	<u>cl</u>
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 9000 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 119  
Sampling Personal: *Darren Nieswaj*

Weather Conditions: Temp: *31* °F Wind: *W9* Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" 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?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Not Visible
Repairs Necessary:	<i>—</i>	
Casing Diameter:	2"	
Water Level Before Purge:	<i>8.62</i>	ft
Total Well Depth:	<i>94.6 / 6.5</i>	ft
Well Volume:	<i>5.0</i>	liters
Depth to Top of Pump:	<i>12.10</i>	ft
Water Level After Sample:		ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<i>5</i> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	<i>55</i> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	<i>—</i>
Duplicate Sample ID:	<i>—</i>		Pumping Rate:	<i>100</i> mL/min
Purge Date:	<i>11 Oct 16</i>	Time Purging Began:	<i>1105</i>	<i>am</i> /pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	<i>—</i> am/pm
Sample Date:	<i>11 Oct 16</i>	Time of Sampling:	<i>1145</i>	<i>am</i> /pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1110	13.39	1125	7.27	2.11	69.1	12.5	8.63	500	<i>clear</i>
2	1120	13.15	1125	7.28	2.10	60.7	9.49	8.64	1000	<i>clear</i>
3	1130	13.34	1129	7.27	2.03	47.1	3.70	8.64	1000	<i>clear</i>
4	1135	13.35	1131	7.27	2.00	47.5	3.38	8.64	500	<i>clear</i>
5	1140	13.34	1130	7.27	2.01	49.1	3.21	8.64	500	<i>clear</i>
6	1145	13.44	1130	7.27	2.02	48.7	3.10	8.64	500	<i>clear</i>
7										
8										
9										
10										

Stabilized: Yes No  
Comments: *—*

Total Volume Removed: 4000 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 2-10  
Sampling Personal: Darren Nieswag

Weather Conditions: Temp: 36 °F Wind: N9 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.27	ft	
Total Well Depth:	55.43	ft	
Well Volume:	16.5	liters	
Depth to Top of Pump:	30.00	ft	
Water Level After Sample:	10.54	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"/>	Recover: 55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: 10-15
Duplicate Sample ID:		Pumping Rate: 100 mL/min
Purge Date:	11 Oct 16	Time Purging Began: 1247 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry: <input checked="" type="checkbox"/>
Sample Date:	11 Oct 16	Time of Sampling: 1342 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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
									slightly turbid
									clear
									clear
									clear
									clear
									clear
									clear
									clear
									clear
									clear

Stabilized: Yes  No   
Comments:

Total Volume Removed: 5500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 102  
Sampling Personal: *Parren Nieswag*

Weather Conditions: Temp: 37 °F Wind: NW 9 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:	18.93	ft	
Total Well Depth:	29.70	ft	
Well Volume:		liters	
Depth to Top of Pump:	20.42	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="radio"/> No	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	10-15
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	11 Oct 16	Time Purging Began:	1451	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	11 Oct 16	Time of Sampling:	1611	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1456	11.21	6500	6.91	1.68	31.3	98.7	19.19	500	slightly turbid
2	1511	10.89	6492	6.91	1.22	25.4	38.7	19.21	1500	clear
3	1526	10.83	6519	6.92	0.99	22.5	29.5	19.24	1500	clear
4	1541	10.66	6499	6.91	0.40	21.9	13.1	19.28	1500	clear
5	1556	10.78	6496	6.91	1.10	21.2	6.31	19.28	1500	clear
6	1601	10.69	6514	6.92	1.89	21.0	4.97	19.28	500	clear
7	1606	10.68	6513	6.92	1.77	20.9	4.71	19.31	500	clear
8	1611	10.68	6518	6.92	1.90	20.6	4.71	19.30	500	clear
9										
10										

Stabilized:  Yes  No

Total Volume Removed: 8000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 118  
Sampling Personal: *Darren Niesway*

Weather Conditions: Temp: 27 °F Wind: SW 7 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:	<input checked="" type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.39	ft	
Total Well Depth:	11.90	ft	
Well Volume:	2.2	liters	
Depth to Top of Pump:	9.08	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 type="checkbox"/> No <input checked="" 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:	12 Oct 16	Time Purging Began:	0854 am/pm
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	12 Oct 16	Time of Sampling:	0949 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	0859	12.58	1721	7.38	3.84	153.3	74.8	8.48	500	Slightly turbid
2	0914	13.28	1697	7.39	3.26	147.2	25.2	8.55	1500	clear
3	0929	13.29	1699	7.40	2.98	139.5	11.8	8.48	1500	clear
4	0934	13.53	1698	7.40	2.96	136.4	4.25	8.45	500	clear
5	0939	13.57	1697	7.40	2.97	134.9	3.00	8.45	500	clear
6	0944	13.59	1699	7.41	2.91	134.1	2.91	8.45	500	clear
7	0949	13.64	1699	7.41	2.91	133.7	2.78	8.45	500	clear
8										
9										
10										

Stabilized: Yes No  
Comments: (circled Yes)

Total Volume Removed: 5500 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2016

Sample ID: 111

Sampling Personal: *Parron Nieswag*

Weather Conditions: Temp: *37* °F Wind: *NW 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:	<i>7.90</i>	ft
Total Well Depth:	<i>17.81</i>	ft
Well Volume:	<i>6.2</i>	liters
Depth to Top of Pump:	<i>14.30</i>	ft
Water Level After Sample:	<i>7.92</i>	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings		
Sampling Method:	Bladder	Purge: <i>5</i> sec.		
Dedicated Equip?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Recover: <i>55</i> sec.		
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: <i>—</i>		
Duplicate Sample ID:	<i>Purge-1</i>	Pumping Rate: <i>100</i> mL/min		
Purge Date:	<i>11 OCT 16</i>	Time Purging Began: <i>1715</i> am/pm		
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry: <i>—</i> am/pm		
Sample Date:	<i>11 OCT 16</i>	Time of Sampling: <i>1800</i> am/pm		
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1720	11.44	3894	6.97	1.65	52.6	34.4	7.92	500	<i>cl</i>
2	1735	11.72	3354	<del>6.97</del> 7.10	2.76	58.4	9.02	7.92	1500	<i>cl</i>
3	1740	11.64	3230	7.13	3.23	60.7	5.24	7.92	500	<i>cl</i>
4	1745	11.86	<del>3403</del> 3170	7.14	3.21	62.2	4.88	7.92	500	<i>cl</i>
5	1750	11.83	3168	7.15	3.28	63.6	3.68	7.92	500	<i>cl</i>
6	1755	11.64	3170	7.16	3.30	64.5	3.47	7.92	500	<i>cl</i>
7	1800	11.38	3159	7.16	3.60	65.6	3.57	7.92	500	<i>cl</i>
8										
9										
10										

Stabilized:  Yes  No

Total Volume Removed: *4500* mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 117  
Sampling Personal: *Rachel N. [unclear]*

Weather Conditions: Temp: ~~33~~ 25 °F Wind: W 6 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	No	Not Visible
Repairs Necessary:	<input checked="" type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	5.96		ft
Total Well Depth:	11.51		ft
Well Volume:	3.5		liters
Depth to Top of Pump:	8.09		ft
Water Level After Sample:	8.09		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	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	11 Oct 16	Time Purging Began:	0755	am/pm
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	No	Time Purged Dry:	1830
Sample Date:	12 Oct 16	Time of Sampling:	0753	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	0800	12.59	7514	7.01	7.28	196.5	6.87	500	clear
2	0810	12.29	7381	7.09	8.20	189.0	6.46	1000	clear
3	0820	12.69	7343	7.04	8.09	188.3	9.66	1000	clear
4	0830	12.87	7382	7.00	8.84	187.6	11.9	1000	clear
5									
6	0748	started to purge line							
7	0753	13.21	8017	7.03	7.23	168.2	4.92	500	clear
8									
9									
10									

Stabilized: Yes  No  
Comments:

Total Volume Removed: 3500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: 103  
Sampling Personal: Darren Nilsen

Weather Conditions: Temp: 40 °F Wind: 510 Precip: Sunny / Partly Cloudy / Cloudy

Well Information		
Well Locked?	Yes	No
Well Labeled?	Yes	No
Casing Straight?	Yes	No
Grout Seal Intact?	Yes	No
Repairs Necessary:	Not Visible	
Casing Diameter:	2"	
Water Level Before Purge:	10.26	ft
Total Well Depth:	21.15	ft
Well Volume:	17.3 + 6.8	liters
Depth to Top of Pump:	17.21	ft
Water Level After Sample:	10.29	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information		
Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 5 sec.
Dedicated Equip?:	Yes	Recover: 55 sec.
Duplicate Sample?:	Yes	PSI: -
Duplicate Sample ID:	Pumping Rate: 100 mL/min	
Purge Date:	12 Oct 16	Time Purging Began: 1225 am/pm
Well Purged Dry?	Yes	Time Purged Dry: - am/pm
Sample Date:	12 Oct 16	Time of Sampling: 1315 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter Nitric

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid	
1	1230	10.03	4389	7.22	3.54	119.4	89.1	10.27	500	slightly turbid
2	1245	11.40	4164	7.27	2.40	117.2	32.4	10.27	1500	SK
3	1300	11.74	1587	7.26	1.84	116.5	8.93	10.27	1500	clear
4	1305	11.45	1577	7.26	1.74	116.0	2.65	10.27	4500	clear
5	1310	11.40	1570	7.26	1.63	115.4	2.53	10.27	500	clear
6	1315	11.87	1562	7.26	1.58	115.0	2.41	10.27	500	clear
7										
8										
9										
10										

Stabilized: Yes No  
Comments: (signature)

Total Volume Removed: 5000 mL





# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2016  
 Sample ID: 109  
 Sampling Personal: Darren Niswaga

Weather Conditions: Temp: 35 °F Wind: 59 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	10.26	ft	
Total Well Depth:	17.04	ft	
Well Volume:	4.2	liters	
Depth to Top of Pump:	13.21	ft	
Water Level After Sample:	10.28	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	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No	PSI:	
Duplicate Sample ID:	Pumping Rate: 100 mL/min		
Purge Date:	12 Oct 16	Time Purging Began:	1053 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No	Time Purged Dry:	
Sample Date:	12 Oct 16	Time of Sampling:	1123 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	10.69	1614	7.25	3.21	125.8	4.62	10.28	500	clear
2	1103	10.25	1601	7.25	2.67	126.7	3.05	10.28	500	clear
3	1108	10.30	1598	7.24	2.39	127.0	1.19	10.28	500	clear
4	1113	10.09	1602	7.25	2.26	127.0	0.95	10.28	500	clear
5	1118	10.04	1602	7.24	2.15	127.0	0.92	10.28	500	clear
6	1125	10.20	1603	7.24	2.08	126.7	0.86	10.28	500	clear
7										
8										
9										
10										

Stabilized:  Yes  No  
 Comments:

Total Volume Removed: 3000 mL



**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.mvttl.com



January 18, 2017

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

RE: Groundwater Sampling Event - 2016 at MDU Lewis & Clark Site

Dear Ms. Marshall:

It was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the correct Field Data Report and a list of the corrections that BARR brought to our attention.

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

Sincerely,

Jeremy Meyer  
MVTL Field Services



## 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.mvtl.com](http://www.mvtl.com)



List of corrections for the August 2016 sampling event at Lewis and Clark.

1. On the field data report, MW110 lists EC = 1119 but the COC EC and lab report = 1114.
2. On the field data report, MW102 lists 9,000 mL for the volume removed but the raw data volumes add up to 10,500 mL.
3. On the field data report, MW117 has a sample date and time of 12/13/16 at 2233 but the raw data and COC list 12/14/16 at 0840.
4. On the field data report, MW117 has a starting water level at 5.96' but the raw data lists 4.94'.
5. On the field data report, MW109 lists 6,500 mL for the volume removed but the raw data volumes add up to 5,500 mL.



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Lewis and Clark**  
CCR Sampling

WO# 82-4070  
82-4047

Attn: Samantha Marshall  
400 North 4th St  
Bismarck, ND 58501

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	TOTAL DEPTH (FT)	WATER LEVEL END (FT)	VOLUME IN WELL (Liters)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE
											TEMP (°C)	EC	pH	Turb. NTU	
MW110	12-Dec-16	13:10	12-Dec-16	15:10	9.31	16.95	9.44	4.8	12000.0	Bladder	10.20	1114*	7.33	4.78	clear
MW119	12-Dec-16	17:00	12-Dec-16	18:00	8.56	16.65	9.21	4.8	6500.0	Bladder	8.89	1168	7.34	2.95	clear
MW210	13-Dec-16	9:15	13-Dec-16	10:35	9.34	35.43	11.65	16.1	8000.0	Bladder	9.27	1430	7.56	3.24	clear
MW102	13-Dec-16	11:45	13-Dec-16	13:30	18.80	24.70	19.18	3.7	10500.0*	Bladder	10.14	6948	6.93	4.51	clear
MW118	13-Dec-16	16:45	13-Dec-16	18:15	8.67	11.90	8.75	2.0	9000.0	Bladder	9.75	1695	7.50	4.77	clear
MW111	13-Dec-16	14:40	13-Dec-16	15:35	8.05	17.81	8.10	6.1	5500.0	Bladder	9.80	3230	7.22	1.35	clear
MW117	12-Dec-16	12:10	12/14/2016*	8:40*	4.94*	11.51	8.09	4.1	5500.0	Bladder	8.30	7879	6.99	67.50	slightly turbid
MW103	14-Dec-16	11:20	14-Dec-16	12:40	10.73	21.15	10.76	6.5	8000.0	Bladder	10.54	1537	7.27	4.45	clear
MW109	14-Dec-16	9:15	14-Dec-16	10:10	10.68	17.04	10.77	4.0	5500.0*	Bladder	10.12	1614	7.24	1.80	clear
MW101	NA	NA	12-Dec-16	11:33	9.28	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW105	NA	NA	12-Dec-16	11:55	8.99	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW106	NA	NA	12-Dec-16	11:53	9.67	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW107	NA	NA	12-Dec-16	11:31	4.41	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW108	NA	NA	12-Dec-16	11:50	16.72	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW116	NA	NA	12-Dec-16	11:45	10.68	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
*corrections made on 18 Jan 2017															



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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



January 3, 2017

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

RE: Groundwater Sampling Event - 2016 at MDU Lewis & Clark Site

Dear Ms. Marshall:

From December 12-14, 2016, MVTL Laboratories' Field Services division collected ground water samples at the MDU Lewis & Clark Station near Sidney, MT. The wells were sampled for CCR analysis, dissolved metals, and TSS. Samples were collected from 9 wells. A duplicate sample was also collected at well MW119. The wells were located, and were found to be in generally good condition. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer  
MVTL Field Services



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Lewis and Clark**  
CCR Sampling

Attn: Samantha Marshall  
400 North 4th St  
Bismarck, ND 58501

WO# 82-4070  
82-4047

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	TOTAL DEPTH (FT)	WATER LEVEL END (FT)	VOLUME IN WELL (Liters)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE
											TEMP (°C)	EC	pH	Turb. NTU	
MW110	12-Dec-16	13:10	12-Dec-16	15:10	9.31	16.95	9.44	4.8	12000.0	Bladder	10.20	1119	7.33	4.78	clear
MW119	12-Dec-16	17:00	12-Dec-16	18:00	8.56	16.65	9.21	4.8	6500.0	Bladder	8.89	1168	7.34	2.95	clear
MW210	13-Dec-16	9:15	13-Dec-16	10:35	9.34	35.43	11.65	16.1	8000.0	Bladder	9.27	1430	7.56	3.24	clear
MW102	13-Dec-16	11:45	13-Dec-16	13:30	18.80	24.70	19.18	3.7	9000.0	Bladder	10.14	6948	6.93	4.51	clear
MW118	13-Dec-16	16:45	13-Dec-16	18:15	8.67	11.90	8.75	2.0	9000.0	Bladder	9.75	1695	7.50	4.77	clear
MW111	13-Dec-16	14:40	13-Dec-16	15:35	8.05	17.81	8.10	6.1	5500.0	Bladder	9.80	3230	7.22	1.35	clear
MW117	12-Dec-16	12:10	13-Dec-16	22:33	5.96	11.51	8.09	4.1	5500.0	Bladder	8.30	7879	6.99	67.50	slightly turbid
MW103	14-Dec-16	11:20	14-Dec-16	12:40	10.73	21.15	10.76	6.5	8000.0	Bladder	10.54	1537	7.27	4.45	clear
MW109	14-Dec-16	9:15	14-Dec-16	10:10	10.68	17.04	10.77	4.0	6500.0	Bladder	10.12	1614	7.24	1.80	clear
MW101	NA	NA	12-Dec-16	11:33	9.28	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW105	NA	NA	12-Dec-16	11:55	8.99	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW106	NA	NA	12-Dec-16	11:53	9.67	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW107	NA	NA	12-Dec-16	11:31	4.41	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW108	NA	NA	12-Dec-16	11:50	16.72	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW116	NA	NA	12-Dec-16	11:45	10.68	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Parrish N. Esway

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date: <u>12 Dec 16</u>		Time: <u>0650</u>				
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.51</u>	<u>6.90</u>	<u>7.00</u>	6.95-7.05	<u>-48.4</u>	0 +/- 50
Buffer 10	<u>17.28</u>	<u>10.04</u>	<u>10.00</u>	9.95-10.05	<u>-226.7</u>	-180 +/- 50
Conductivity		Check				
Buffer 1413	<u>17.05</u>	<u>1426</u>	<u>1413</u>	±10%	Buffer 5000	<u>4970</u>
ORP		Barometric Pressure (mm Hg)				
231 mV @ 25C	<u>17.10</u>	<u>240.8</u>	<u>231.0</u>	±10 mV	mg/L	<u>711.5</u>
DO		Barometric Pressure (mm Hg)				
	<u>8.08</u>	<u>13.25</u>	<u>11.00</u>		mg/L	<u>711.5</u>

Pre Site Calibration						
Date: <u>13 Dec 16</u>		Time: <u>0700</u>				
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.92</u>	<u>7.05</u>	<u>7.00</u>	6.95-7.05	<u>-50.8</u>	0 +/- 50
Buffer 10	<u>17.32</u>	<u>9.96</u>	<u>10.00</u>	9.95-10.05	<u>-227.1</u>	-180 +/- 50
Conductivity		Check				
Buffer 1413	<u>17.47</u>	<u>1385</u>	<u>1414</u>	±10%	Buffer 5000	<u>5011</u>
ORP		Barometric Pressure (mm Hg)				
231 mV @ 25C	<u>17.60</u>	<u>228.5</u>	<u>231.1</u>	±10 mV	mg/L	<u>710.4</u>
DO		Barometric Pressure (mm Hg)				
	<u>17.58</u>	<u>8.70</u>	<u>8.88</u>		mg/L	<u>710.4</u>

Post Site Check		
Time: <u>2010</u>		
pH	Temp °C	Reading
Buffer 7	<u>7.05</u> <u>8.22</u>	<u>7.05</u>
Conductivity		
Buffer 1413	<u>10.15</u>	<u>1423</u>

Post Site Check		
Time: <u>1935</u>		
pH	Temp °C	Reading
Buffer 7	<u>13.58</u>	<u>7.04</u>
Conductivity		
Buffer 1413	<u>14.34</u>	<u>1422</u>

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Wiseman

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	14 Dec 16		Time:	0700		
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	18.50	7.05	6.99	6.95-7.05	-53.6	0 +/- 50
Buffer 10	18.64	9.97	10.00	9.95-10.05	-228.6	-180 +/- 50
Conductivity					Check	
Buffer 1413	19.69	1398	1413	±10%	Buffer 5000	4974
ORP						
231 mV @ 25C	1892	229.1	231.1	±10 mV		
DO				Barometric Pressure (mm Hg)		
	19.33	9.53	8.42	mg/L	715.7	

Post Site Check		
Time:	1250	
pH	Temp °C	Reading
Buffer 7	10.16	7.02
Conductivity		
Buffer 1413	10.20	1415

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
Conductivity					Check	
Buffer 1413				±10%	Buffer 5000	
ORP						
231 mV @ 25C				±10 mV		
DO				Barometric Pressure (mm Hg)		
				mg/L		

Time:		
pH	Temp °C	Reading
Buffer 7		
Conductivity		
Buffer 1413		





2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Water Level

Sampling Personnel:

Darren Nicoswamy

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	17 Dec 11	1115	Dry	
West Scrubber Pond Gauge	14 Dec 11	1114	6.30	
Stream behind Sewage Lagoon	14 Dec 11	1345	0.51	



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

# Field Datasheet

## Water Level

Sampling Personnel:

Darren Wieswag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	12 Dec 16	1133	9.28	
MW105	12 Dec 16	1155	8.99	
MW106	12 Dec 16	1153	9.67	
MW107	12 Dec 16	1131	4.41	
MW108	12 Dec 16	1150	6.72	
MW116	12 Dec 16	1145	10.68	



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2016

Sample ID: MW110

Sampling Personal: Darren Wisway

Weather Conditions: Temp: 6 °F Wind: NW 11 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:	9.31	ft	
Total Well Depth:	16.95	ft	
Well Volume:	4.8	liters	
Depth to Top of Pump:	13.52	ft	
Water Level After Sample:	9.44	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="radio"/> No	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	—
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	12 Dec 16	Time Purging Began:	1310	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	12 Dec 16	Time of Sampling:	1510	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1315		9.32	1114	7.36	3.28	168.3	15.2	9.51	500	Foam slightly turbid
2	1330		10.10	1112	7.33	2.44	164.5	76.1	9.39	1500	Slightly turbid
3	1345		10.63	1113	7.32	2.33	157.7	35.8	9.46	1500	ST
4	1400		11.25	1114	7.32	2.23	152.1	12.2	9.41	1500	clear
5	1415		10.94	1114	7.32	2.23	151.8	8.95	9.41	1500	clear
6	1430		10.85	1113	7.32	2.21	145.6	6.88	9.44	1500	clear
7	1445		10.13	1111	7.32	2.24	138.0	5.53	9.42	1500	clear
8	1500		9.94	1113	7.33	2.22	134.3	4.98	9.41	1500	clear
9	1505		10.07	1113	7.32	2.20	133.5	4.85	9.48	500	clear
10	1510		10.20	1114	7.33	2.20	133.0	4.78	9.48	500	clear

Stabilized:  Yes  No

Total Volume Removed: 12,000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW 119  
Sampling Personal: Darren Nieswanger

Weather Conditions: Temp: 4 °F Wind: NW 10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<u>No</u>	
Well Labeled?	Yes	No	
Casing Straight?	<u>Yes</u>	No	
Grout Seal Intact?	<u>Yes</u>	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.87		ft
Total Well Depth:	16.65		ft
Well Volume:	<del>14.9</del> 4.8		liters
Depth to Top of Pump:	13.31		ft
Water Level After Sample:	9.21		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 5 sec.
Dedicated Equip?:	Yes <u>No</u>	Recover: 55 sec.
Duplicate Sample?:	<u>Yes</u> No	PSI: <u>    </u>
Duplicate Sample ID:	Dup 1	Pumping Rate: 100 mL/min
Purge Date:	12 Dec 16	Time Purging Began: 1700 am/pm
Well Purged Dry?	Yes <u>No</u>	Time Purged Dry: <u>    </u> am/pm
Sample Date:	12 Dec 16	Time of Sampling: 1800 am/pm
Bottle	2 - 500 mL Nitric	2 - 1 Liter Raw
List:	2 - 500 mL Nitric (filtered)	8 - 1 Liter 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	1705	1148	7.30	3.18	142.5	19.9	9.21	500	cl
2	1720	1159	7.32	2.16	104.4	10.7	9.21	1500	cl
3	1735	1166	7.32	1.65	43.4	6.10	9.21	1500	cl
4	1745	1170	7.33	1.53	27.8	4.06	9.21	1500	cl
5	1750	1169	7.34	1.50	25.8	3.21	9.21	500	cl
6	1755	1170	7.34	1.53	24.0	3.04	9.21	500	cl
7	1800	1168	7.34	1.51	23.3	2.95	9.21	<del>500</del>	cl
8									
9									
10									

Stabilized: Yes No  
Comments:

Total Volume Removed: 6500 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: nw210  
Sampling Personal: Darren Wiseman

Weather Conditions: Temp: 5 °F Wind: sw 10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	<del>Yes</del> <input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Casing Straight?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes <input type="radio"/> No	Not Visible
Repairs Necessary:	<input type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	9.34	ft
Total Well Depth:	35.47	ft
Well Volume:	76.1	liters
Depth to Top of Pump:	29.91	ft
Water Level After Sample:	11.65	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="radio"/> No	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="radio"/> No	PSI: <u>-</u>
Duplicate Sample ID:	<u>-</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>13 Dec 16</u>	Time Purging Began: <u>0915</u> am/pm
Well Purged Dry?	Yes <input checked="" type="radio"/> No	Time Purged Dry: <u>-</u> am/pm
Sample Date:	<u>13 Dec 16</u>	Time of Sampling: <u>1035</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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.
SEQ #	Time								clear, slightly turbid, turbid
1	0920	9.59	1505	7.72	5.32	77.6	10.48	500	slightly turbid
2	0935	9.14	1467	7.57	1.72	-27.4	11.26	1500	clear
3	0950	9.47	1471	7.57	1.28	-56.8	11.57	1500	clear
4	1005	9.45	1473	7.58	1.07	-55.4	11.57	1500	clear
5	1015	9.78	1473	7.57	0.97	-57.0	11.61	1000	clear
6	1020	9.76	1472	7.57	0.96	-58.7	11.59	500	clear
7	1025	9.69	1472	7.57	0.95	-60.8	11.59	500	clear
8	1030	9.60	1468	7.56	0.94	-63.0	11.61	500	clear
9	1035	9.27	1430	7.56	0.94	-63.8	11.61	500	clear
10									

Stabilized:  Yes  No  
Comments: ✓

Total Volume Removed: 6,000 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: nw102  
Sampling Personal: Paron Niswag

Weather Conditions: Temp: 10 °F Wind: W 10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Well Labeled?	<input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Casing Straight?	<input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Grout Seal Intact?	<input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Visible
Repairs Necessary:	<u>---</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>18.80</u>		ft
Total Well Depth:	<u>24.70</u>		ft
Well Volume:	<u>3.7</u>		liters
Depth to Top of Pump:	<u>20.37</u>		ft
Water Level After Sample:	<u>19.18</u>		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>-</u>
Duplicate Sample ID:	<u>---</u>		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>13 Dec 16</u>	Time Purging Began:	<u>1145</u> <u>8:45</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>13 Dec 16</u>	Time of Sampling:	<u>1330</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter Nitric	

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1150	10.27	6835	6.91	2.46	28.9	19.8	19.18	500	clear
2	1205	10.46	6864	6.93	0.99	0.0	34.7	19.18	1500	clear
3	1220	10.39	6850	6.93	0.82	-7.0	23.1	19.18	1500	clear
4	1235	10.54	6862	6.92	0.69	-10.3	11.3	19.18	1500	clear
5	1250	10.43	6888	6.93	0.68	-12.3	8.72	19.18	1500	clear
6	1305	10.41	6895	6.93	0.66	-13.9	5.33	19.18	1500	clear
7	1320	10.15	6930	6.93	0.65	-15.1	4.84	19.18	1500	clear
8	1325	10.26	6943	6.93	0.64	-15.4	4.67	19.18	500	clear
9	1330	10.14	6948	6.93	0.61	-15.6	4.51	19.18	500	clear
10										

Stabilized: Yes No  
Comments: ---

Total Volume Removed: 9,000 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW118  
Sampling Personal: Darion McGowan

Weather Conditions: Temp: 9 °F Wind: W16 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.67		ft
Total Well Depth:	11.90		ft
Well Volume:	2.0		liters
Depth to Top of Pump:	9.55		ft
Water Level After Sample:	8.75		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	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	13 Dec 16	Time Purging Began:	1645	am/pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	
Sample Date:	13 Dec 16	Time of Sampling:	1815	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1650	9.48	1696	7.50	5.28	86.4	62.0	8.73	500	Slightly turbid
2	1705	9.58	1693	7.50	3.85	81.5	33.4	8.75	1500	clear
3	1720	9.31	1695	7.51	3.83	79.9	19.1	8.75	1500	clear
4	1735	9.68	1693	7.50	3.48	78.5	10.9	8.75	1500	clear
5	1750	9.72	1693	7.50	3.23	76.7	5.74	8.75	1500	clear
6	1805	9.73	1694	7.50	3.18	75.8	4.91	8.75	1500	clear
7	1810	9.78	1694	7.50	3.16	75.8	4.97	8.75	500	clear
8	1815	9.75	1695	7.50	3.19	75.7	4.77	8.75	500	clear
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 9000 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW11  
Sampling Personal: DARRIN N. SWANSON

Weather Conditions: Temp: 13 °F Wind: NW 16 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<del>No</del>	
Well Labeled?	<del>Yes</del>	No	
Casing Straight?	<del>Yes</del>	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.05		ft
Total Well Depth:	17.81		ft
Well Volume:	6.1		liters
Depth to Top of Pump:	13.38		ft
Water Level After Sample:	8.10		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes	<del>No</del>	Recover:	515 sec.
Duplicate Sample?:	Yes	<del>No</del>	PSI:	
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	13 Dec 16	Time Purging Began:	1440	am/pm
Well Purged Dry?	Yes	<del>No</del>	Time Purged Dry:	
Sample Date:	13 Dec 16	Time of Sampling:	1535	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1500	10.02	3249	7.19	2.22	45.2	14.3	8.10	1500	dr
3	1515	9.87	3240	7.21	2.26	56.1	7.01	8.10	1500	dr
4	1520	9.43	3239	7.22	2.27	61.4	2.22	8.10	500	dr
5	1525	9.89	3239	7.22	2.28	61.8	1.45	8.10	500	dr
6	1530	9.89	3230	7.22	2.28	63.4	1.41	8.10	500	clear
7	1535	9.80	3230	7.22	2.26	64.9	1.35	8.10	500	dr
8										
9										
10										

Stabilized: (Yes) No  
Comments:

Total Volume Removed: 5500 mL





# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW117  
Sampling Personal: *Darcia Nieswaj*

Weather Conditions: Temp: 5 °F Wind: NW 5 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:	<input checked="" type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	4.94	ft
Total Well Depth:	11.51	ft
Well Volume:	4.1	liters
Depth to Top of Pump:	8.09	ft
Water Level After Sample:	8.09 Top of Pump	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings
Sampling Method:	Bladder		Purge: <u>3</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Recover: <u>57</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		PSI: <u>-</u>
Duplicate Sample ID:	<u>-</u>		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>12 Dec 16</u>	Time Purging Began:	<u>1210</u> <del>am/pm</del>
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	<u>1245</u> <del>am/pm</del>
Sample Date:	<u>13 Dec 16</u>	Time of Sampling:	<u>0820</u> <del>am/pm</del>
	<u>14 Dec 16</u>		<u>0840</u> <del>am/pm</del>
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1215	7.69	7857	7.14	8.61	216.9	154	6.40	500	slightly turbid
2	1225	8.05	7858	7.17	7.57	210.7	126	7.15	1000	ST
3	1235	7.73	7814	7.13	7.20	204.9	85.6	7.62	1000	ST
4	1245	8.14	7846	7.13	6.99	200.8	214.0	8.00	1000	ST
5	1250	8.07	7841	7.11	6.61	193.0	204	8.09	1000	ST
6										13 Dec 16 started to purge
7	0815							6.10		Prep for 5 min. to clear
8	0820	8.20	8134	7.46	8.01	93.7	101	6.82	500	ST
9	0835							6.22		Purge line 14 Dec 16
10	0840	8.30	7879	6.99	9.10	188.6	67.5	6.72	500	ST

Stabilized: Yes  No   
Comments: ( )

Total Volume Removed: ~~3500~~ mL  
4500



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2016  
 Sample ID: NW103  
 Sampling Personal: Darren Nierman

Weather Conditions: Temp: -2 °F Wind: NW 9 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	10.73	ft	
Total Well Depth:	21.15	ft	
Well Volume:	6.5	liters	
Depth to Top of Pump:	17.18	ft	
Water Level After Sample:	10.76	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	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	
Duplicate Sample ID:			Pumping Rate:	107 mL/min
Purge Date:	14 Dec 16	Time Purging Began:	11:20	am/pm
Well Purged Dry?:	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	
Sample Date:	14 Dec 16	Time of Sampling:	12:40	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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.
1	11:25	1632	7.24	1.50	78.0	92.5	10.76	500	clear, slightly turbid, turbid
2	11:40	1660	7.25	1.00	76.5	47.1	10.76	1500	clear
3	11:55	1592	7.26	0.93	77.9	21.3	10.76	1500	clear
4	12:10	1548	7.26	0.83	77.6	12.6	10.76	1500	clear
5	12:25	1544	7.27	0.77	76.3	5.43	10.76	1500	clear
6	12:30	1554	7.27	0.78	76.0	4.47	10.76	500	clear
7	12:35	1541	7.27	0.73	75.4	4.80	10.76	500	clear
8	12:40	1537	7.27	0.72	75.0	4.75	10.76	500	clear
9									
10									

Stabilized:  Yes  No

Total Volume Removed: 8000 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW109  
Sampling Personal: Jarrod Nieswaj

Weather Conditions: Temp: -5 °F Wind: W7 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:	<u>-</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>10.68</u>	ft	
Total Well Depth:	<u>17.04</u>	ft	
Well Volume:	<u>4.0</u>	liters	
Depth to Top of Pump:	<u>13.37</u>	ft	
Water Level After Sample:	<u>10.77</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?:	Yes <input checked="" type="checkbox"/>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI:	<u>-</u>
Duplicate Sample ID:	<u>-</u>	Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>14 Dec 16</u>	Time Purging Began:	<u>0915</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry:	<u>-</u> am/pm
Sample Date:	<u>14 Dec 16</u>	Time of Sampling:	<u>-</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	0920	8.75	1613	7.26	1.72	200.6	23.2	10.78	500	cl
2	0935	9.73	1611	7.24	1.08	174.1	14.0	10.74	1500	cl
3	0950	9.89	1610	7.24	0.91	150.0	6.11	10.77	1500	cl
4	0955	10.11	1614	7.24	0.91	142.9	3.70	10.76	500	cl
5	1000	10.21	1615	7.24	0.90	138.3	1.71	10.75	500	cl
6	1005	10.20	1613	7.24	0.89	135.0	1.75	10.76	500	cl
7	1010	10.12	1614	7.24	0.87	130.5	1.80	10.77	500	cl
8										
9										
10										

Stabilized: Yes  No   
Comments: -

Total Volume Removed: 6500 mL



CASE NARRATIVE – AMENDED 21 FEB 17

MVTL Lab Reference No/SDG: 201682-4047
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater – December 2016 Event
MVTL Laboratory Identifications: 16-W5953 through 16-W5963
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include MW110, MW119, MW210, MW102, MW118, MW111, MW117, MW103, MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 15 December 2016 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 0.7°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.



CASE NARRATIVE – AMENDED 21 FEB 17

MVTL Lab Reference No/SDG: 201682-4047  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: CCR Groundwater – December 2016 Event  
MVTL Laboratory Identifications: 16-W5953 through 16-W5963  
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 metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - Recovery for one selenium matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.
  - The recoveries for one alkalinity 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 9 Feb 2017 from Terri Olson at Barr, the data package was amended to remove extraneous QC samples from the QC report. In addition, the event name was changed from November 2016 to December 2016.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 21 Feb 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

MEMBER  
ACIL

## Quality Control Report – Amended 22 Feb 2017

Lab IDs: 16-W5953 to 16-W5963

Project: MDU Lewis & Clark CCR

Work Order: 201682-4047

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.1000	106	80-120	0.100	16-W5961	0.0052	0.1108	106	75-125	0.1108	0.1124	107	1.4	20	-	-	< 0.001
				0.100	16-W5963	< 0.001	0.1036	104	75-125	0.1036	0.1037	104	0.1	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	104	80-120	0.400	16-W5953	< 0.001	0.4274	107	75-125	0.4274	0.4212	105	1.5	20	-	-	< 0.001
	0.1000	106	80-120	0.400	16-W5963	< 0.001	0.4384	110	75-125	0.4384	0.4308	108	1.7	20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.1000	105	80-120	0.100	16-W5961	0.0027	0.1070	104	75-125	0.1070	0.1049	102	2.0	20	-	-	< 0.002
				0.100	16-W5963	< 0.002	0.1002	100	75-125	0.1002	0.1017	102	1.5	20	-	-	< 0.002
Arsenic - Total mg/l	0.1000	108	80-120	0.400	16-W5953	< 0.002	0.4418	110	75-125	0.4418	0.4368	109	1.1	20	-	-	< 0.002
	0.1000	105	80-120	0.400	16-W5963	< 0.002	0.4386	110	75-125	0.4386	0.4262	107	2.9	20	-	-	< 0.002
Barium - Dissolved mg/l	0.1000	102	80-120	0.100	16-W5961	0.0224	0.1196	97	75-125	0.1196	0.1214	99	1.5	20	-	-	< 0.002
				0.100	16-W5963	< 0.002	0.0990	99	75-125	0.0990	0.0999	100	0.9	20	-	-	< 0.002
Barium - Total mg/l	0.1000	102	80-120	0.400	16-W5953	0.0339	0.4420	102	75-125	0.4420	0.4384	101	0.8	20	-	-	< 0.002
	0.1000	102	80-120	0.400	16-W5963	< 0.002	0.4102	103	75-125	0.4102	0.4032	101	1.7	20	-	-	< 0.002
Beryllium - Dissolved mg/l	0.1000	105	80-120	0.100	16-W5961	< 0.0005	0.1050	105	75-125	0.1050	0.1040	104	1.0	20	-	-	< 0.0005
				0.100	16-W5963	< 0.0005	0.1056	106	75-125	0.1056	0.1042	104	1.3	20	-	-	< 0.0005
Beryllium - Total mg/l	0.1000	107	80-120	0.400	16-W5953	< 0.0005	0.4258	106	75-125	0.4258	0.4254	106	0.1	20	-	-	< 0.0005
	0.1000	105	80-120	0.400	16-W5963	< 0.0005	0.4312	108	75-125	0.4312	0.4170	104	3.3	20	-	-	< 0.0005
Boron - Dissolved mg/l	0.40	115	80-120	0.400	16-W5953	0.22	0.58	90	75-125	0.58	0.59	93	1.7	20	-	-	< 0.1
	0.40	115	80-120	0.400	16-W5963	< 0.1	0.45	112	75-125	0.45	0.46	115	2.2	20	-	-	< 0.1
Boron - Total mg/l	0.40	100	80-120	2.00	16-D5016	1.04	3.00	98	75-125	3.00	2.96	96	1.3	20	-	-	< 0.1
	0.40	120	80-120	0.400	16-W5953	0.30	0.68	95	75-125	0.68	0.69	97	1.5	20	-	-	< 0.1
	0.40	115	80-120	0.400	16-W5963	0.12	0.51	97	75-125	0.51	0.51	97	0.0	20	-	-	< 0.1
	0.40	115	80-120	0.400	16-W5963	< 0.1	0.44	110	75-125	0.44	0.44	110	0.0	20	-	-	< 0.1
	0.40	110	80-120	0.400	17-D2	1.01	1.40	97	75-125	1.40	1.39	95	0.7	20	-	-	< 0.1
	0.40	115	80-120	0.400	16-W6027	0.39	0.74	88	75-125	0.74	0.73	85	1.4	20	-	-	< 0.1
																-	-



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MEMBER  
ACIL

## Quality Control Report

Lab IDs: 16-W5953 to 16-W5963

Project: MDU Lewis & Clark CCR

Work Order: 201682-4047

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			
Cadmium - Dissolved mg/l	0.1000	113	80-120	0.100 0.100	16-W5961	< 0.0005	0.1036	104	75-125	0.1036	0.1072	107	3.4	20	-	-	< 0.0005			
					16-W5963	< 0.0005	0.1049	105	75-125	0.1049	0.1078	108	2.7	20	-	-	< 0.0005			
Cadmium - Total mg/l	0.1000 0.1000	107 113	80-120 80-120	0.400 0.400	16-W5953	< 0.0005	0.4252	106	75-125	0.4252	0.4184	105	1.6	20	-	-	< 0.0005			
					16-W5963	< 0.0005	0.4514	113	75-125	0.4514	0.4486	112	0.6	20	-	-	< 0.0005			
Calcium - Dissolved mg/l	20.0	98	80-120	100 100	16W5953q	79.8	164	84	75-125	164	164	84	0.0	20	-	-	< 1			
					16W5963q	< 1	93.7	94	75-125	93.7	92.6	93	1.2	20	-	-	< 1			
Calcium - Total mg/l	20.0 20.0	98 98	80-120 80-120	100 100	16W5953q	83.9	171	87	75-125	171	169	85	1.2	20	-	-	< 1			
					16W5963q	< 1	91.4	91	75-125	91.4	91.2	91	0.2	20	-	-	< 1			
																		-	-	< 1
																			-	-
Chloride mg/l	30.0	88	80-120	60.0	16-W5953	21.0	75.6	91	80-120	75.6	74.3	89	1.7	20	-	-	< 1			
Chromium - Dissolved mg/l	0.1000	97	80-120	0.100 0.100	16-W5961	< 0.002	0.0944	94	75-125	0.0944	0.0936	94	0.9	20	-	-	< 0.002			
					16-W5963	< 0.002	0.0948	95	75-125	0.0948	0.0948	95	0.0	20	-	-	< 0.002			
Chromium - Total mg/l	0.1000 0.1000	101 97	80-120 80-120	0.400 0.400	16-W5953	< 0.002	0.3976	99	75-125	0.3976	0.3936	98	1.0	20	-	-	< 0.002			
					16-W5963	< 0.002	0.3918	98	75-125	0.3918	0.3828	96	2.3	20	-	-	< 0.002			
Cobalt - Dissolved mg/l	0.1000	97	80-120	0.100 0.100	16-W5961	< 0.002	0.0960	96	75-125	0.0960	0.0957	96	0.3	20	-	-	< 0.002			
					16-W5963	< 0.002	0.0945	94	75-125	0.0945	0.0951	95	0.6	20	-	-	< 0.002			
Cobalt - Total mg/l	0.1000 0.1000	101 97	80-120 80-120	0.400 0.400	16-W5953	< 0.002	0.3914	98	75-125	0.3914	0.3870	97	1.1	20	-	-	< 0.002			
					16-W5963	< 0.002	0.3958	99	75-125	0.3958	0.3830	96	3.3	20	-	-	< 0.002			
Fluoride mg/l	0.50	100	90-110	0.500 0.500	16-W5958	2.14	2.54	80	80-120	2.54	2.59	90	1.9	20	-	-	< 0.1			
					16-W5963	< 0.1	0.51	102	80-120	0.51	0.52	104	1.9	20	-	-	< 0.1			
Lead - Dissolved mg/l	0.1000	102	80-120	0.100 0.100	16-W5961	< 0.0005	0.0922	92	75-125	0.0922	0.0918	92	0.4	20	-	-	< 0.0005			
					16-W5963	< 0.0005	0.0964	96	75-125	0.0964	0.0962	96	0.2	20	-	-	< 0.0005			
Lead - Total mg/l	0.1000 0.1000	101 102	80-120 80-120	0.400 0.400	16-W5953	< 0.0005	0.3988	100	75-125	0.3988	0.3936	98	1.3	20	-	-	< 0.0005			
					16-W5963	< 0.0005	0.4004	100	75-125	0.4004	0.3920	98	2.1	20	-	-	< 0.0005			
Lithium - Dissolved mg/l	0.40 0.40	105 105	80-120 80-120	0.400 0.400	16-W5953	< 0.1	0.42	105	75-125	0.42	0.42	105	0.0	20	-	-	< 0.1			
					16-W5963	< 0.1	0.38	95	75-125	0.38	0.37	92	2.7	20	-	-	< 0.1			



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MEMBER  
ACIL

## Quality Control Report

Lab IDs: 16-W5953 to 16-W5963

Project: MDU Lewis & Clark CCR

Work Order: 201682-4047

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	16-W5953	< 0.1	0.47	118	75-125	0.47	0.46	115	2.2	20	-	-	< 0.1
	0.40	105	80-120	0.400	16-W5963	< 0.1	0.42	105	75-125	0.42	0.43	108	2.4	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Magnesium - Dissolved mg/l	20.0	101	80-120	100	16W5953q	49.7	138	88	75-125	138	138	88	0.0	20	-	-	< 1
				100	16W5963q	< 1	95.5	96	75-125	95.5	94.4	94	1.2	20	-	-	< 1
Magnesium - Total mg/l	20.0	100	80-120	100	16W5953q	52.2	143	91	75-125	143	142	90	0.7	20	-	-	< 1
	20.0	101	80-120	100	16W5963q	< 1	93.5	94	75-125	93.5	93.0	93	0.5	20	-	-	< 1
															-	-	< 1
															-	-	< 1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	16-W5961	< 0.0002	0.0019	95	70-130	0.0019	0.0018	90	5.4	20	-	-	< 0.0002
				0.002	16-W6025	< 0.0002	0.0019	95	70-130	0.0019	0.0019	95	0.0	20	-	-	< 0.0002
Mercury - Total mg/l	0.0020	105	85-115	0.002	16-W5960	< 0.0002	0.0019	95	70-130	0.0019	0.0020	100	5.1	20	-	-	< 0.0002
				0.002	16-W5976	< 0.0002	0.0019	95	70-130	0.0019	0.0020	100	5.1	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	100	80-120	0.100	16-W5961	0.0250	0.1245	100	75-125	0.1245	0.1314	106	5.4	20	-	-	< 0.002
				0.100	16-W5963	< 0.002	0.0945	94	75-125	0.0945	0.0970	97	2.6	20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000	101	80-120	0.400	16-W5953	0.0045	0.4050	100	75-125	0.4050	0.4092	101	1.0	20	-	-	< 0.002
	0.1000	100	80-120	0.400	16-W5963	< 0.002	0.4072	102	75-125	0.4072	0.4010	100	1.5	20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	7.6	7.6	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.7	7.8	-	1.3	20	-	-	-
Potassium - Dissolved mg/l	10.0	88	80-120	20.0	16W5953q	6.1	23.8	88	75-125	23.8	23.8	88	0.0	20	-	-	< 1
				20.0	16W5963q	< 1	17.6	88	75-125	17.6	17.5	88	0.6	20	-	-	< 1
Potassium - Total mg/l	10.0	88	80-120	20.0	16W5953q	6.6	24.9	92	75-125	24.9	24.7	91	0.8	20	-	-	< 1
	10.0	88	80-120	20.0	16W5963q	< 1	17.3	86	75-125	17.3	17.1	86	1.2	20	-	-	< 1
															-	-	< 1
															-	-	< 1
Selenium - Dissolved mg/l	0.1000	116	80-120	0.100	16-W5961	0.0696	0.1842	115	75-125	0.1842	0.1821	112	1.1	20	-	-	< 0.002
				0.100	16-W5963	< 0.005	0.1152	115	75-125	0.1152	0.1102	110	4.4	20	-	-	< 0.002



**Quality Control Report**

Lab IDs: 16-W5953 to 16-W5963

Project: MDU Lewis & Clark CCR

Work Order: 201682-4047

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	116	80-120	0.400	16-W5953	< 0.01	0.4764	119	75-125	0.4764	0.4618	115	3.1	20	-	-	< 0.002
	0.1000	116	80-120	0.400	16-W5963	< 0.005	0.5246	131	75-125	0.5246	0.5000	125	4.8	20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0	96	80-120	100	16W5953q	78.6	164	85	75-125	164	164	85	0.0	20	-	-	< 1
				100	16W5963q	< 1	91.9	92	75-125	91.9	91.6	92	0.3	20	-	-	< 1
Sodium - Total mg/l	20.0	95	80-120	100	16W5953q	82.9	172	89	75-125	172	171	88	0.6	20	-	-	< 1
	20.0	96	80-120	100	16W5963q	< 1	90.5	90	75-125	90.5	91.2	91	0.8	20	-	-	< 1
Sulfate mg/l	100	92	80-120	1000	16-W5908	1570	2740	117	80-120	2740	2740	117	0.0	20	-	-	< 5
	100	95	80-120	100	16-W5953	172	267	95	80-120	267	271	99	1.5	20	-	-	< 5
	100	91	80-120	100	16-W5970	137	232	95	80-120	232	230	93	0.9	20	-	-	< 5
Thallium - Dissolved mg/l	0.1000	99	80-120	0.100	16-W5961	< 0.001	0.0933	93	75-125	0.0933	0.0944	94	1.2	20	-	-	< 0.0005
				0.100	16-W5963	< 0.001	0.0969	97	75-125	0.0969	0.0985	98	1.6	20	-	-	< 0.0005
Thallium - Total mg/l	0.1000	99	80-120	0.400	16-W5953	0.0006	0.3944	98	75-125	0.3944	0.3922	98	0.6	20	-	-	< 0.0005
	0.1000	99	80-120	0.400	16-W5963	< 0.001	0.4024	101	75-125	0.4024	0.3970	99	1.4	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	91	90-110	410	16-D5025	663	1021	87	80-120	1021	1024	88	0.3	20	90	80-120	< 20
	410	91	90-110	410	16-W5961	295	655	88	80-120	655	656	88	0.2	20	90	80-120	< 20
	410	91	90-110	410	16-W5971	301	614	76	80-120	614	613	76	0.2	20			< 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	984	1010	-	2.6	20	-	-	< 5
	-	-	-	-	-	-	-	-	-	< 5	< 5	-	0.0	*	-	-	< 5
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	35	36	-	2.8	20	-	-	< 1
	-	-	-	-	-	-	-	-	-	88	83	-	5.8	20	-	-	< 1

\* Due to result < 10 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 3 mg/L.

Approved by: C. Cam...

22 Feb 17



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Page: 1 of 2

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

Report Date: 11 Jan 17  
 Lab Number: 16-W5953  
 Work Order #: 82-4047  
 Account #: 002800  
 Date Sampled: 12 Dec 16 15:10  
 Date Received: 15 Dec 16 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
 Sample Description: MW110

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	15 Dec 16	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	15 Dec 16 17:00	SVS
Total Suspended Solids	5	mg/l	2	I3765-85	15 Dec 16 14:27	SVS
pH - Field	7.33	units	NA	SM 4500 H+ B	12 Dec 16 15:10	DJN
Temperature - Field	10.2	Degrees C	NA	SM 2550B	12 Dec 16 15:10	DJN
Total Alkalinity	337	mg/l CaCO3	20	SM2320-B	15 Dec 16 17:00	SVS
Conductivity - Field	1114	umhos/cm	1	EPA 120.1	12 Dec 16 15:10	DJN
Fluoride	0.49	mg/l	0.10	SM4500-F-C	15 Dec 16 17:00	SVS
Sulfate	172	mg/l	5.00	ASTM D516-07	20 Dec 16 16:25	KMD
Chloride	21.0	mg/l	1.0	SM4500-Cl-E	16 Dec 16 10:37	KMD
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	20 Dec 16 11:21	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	618	mg/l	10	I1750-85	16 Dec 16 14:43	SVS
Calcium - Total	83.9	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Magnesium - Total	52.2	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Sodium - Total	82.9	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Potassium - Total	6.6	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	20 Dec 16 10:09	SZ
Boron - Total	0.30	mg/l	0.10	6010	20 Dec 16 12:54	SZ
Calcium - Dissolved	79.8	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Magnesium - Dissolved	49.7	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Sodium - Dissolved	78.6	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Potassium - Dissolved	6.1	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	20 Dec 16 11:11	SZ
Boron - Dissolved	0.22	mg/l	0.10	6010	20 Dec 16 14:45	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	28 Dec 16 18:11	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Barium - Total	0.0339	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Cadmium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Molybdenum - Total	0.0045	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Selenium - Total	< 0.01 ^	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	29 Dec 16 10:48	CC

RL = Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016



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Page: 2 of 2

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

Report Date: 11 Jan 17
Lab Number: 16-W5953
Work Order #: 82-4047
Account #: 002800
Date Sampled: 12 Dec 16 15:10
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW110

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll

Handwritten initials and date: 11 Jan 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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Samantha Marshall
Montana Dakota Utilities
400 N. 4th
Bismarck ND 58501

Report Date: 11 Jan 17
Lab Number: 16-W5954
Work Order #: 82-4047
Account #: 002800
Date Sampled: 12 Dec 16 18:00
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW119

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical tests like pH, Total Suspended Solids, Temperature, etc.

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

Report Date: 11 Jan 17  
Lab Number: 16-W5954  
Work Order #: 82-4047  
Account #: 002800  
Date Sampled: 12 Dec 16 18:00  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
Sample Description: MW119

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Barium - Dissolved	0.0342	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	29 Dec 16 10:48	CC
Cadmium - Dissolved	0.0005	mg/l	0.0005	6020	29 Dec 16 10:48	CC
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	29 Dec 16 10:48	CC
Molybdenum - Dissolved	0.0043	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	29 Dec 16 10:48	CC
Thallium - Dissolved	< 0.001 ^	mg/l	0.0005	6020	29 Dec 16 10:48	CC

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* 11 Jan 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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Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 11 Jan 17  
Lab Number: 16-W5955  
Work Order #: 82-4047  
Account #: 002800  
Date Sampled: 13 Dec 16 10:35  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
Sample Description: MW210

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	15 Dec 16	SVS
pH	* 7.5	units	N/A	SM4500 H+ B	15 Dec 16 17:00	SVS
Total Suspended Solids	2	mg/l	2	I3765-85	15 Dec 16 14:27	SVS
pH - Field	7.56	units	NA	SM 4500 H+ B	13 Dec 16 10:35	DJN
Temperature - Field	9.27	Degrees C	NA	SM 2550B	13 Dec 16 10:35	DJN
Total Alkalinity	372	mg/l CaCO3	20	SM2320-B	15 Dec 16 17:00	SVS
Conductivity - Field	1430	umhos/cm	1	EPA 120.1	13 Dec 16 10:35	DJN
Fluoride	0.96	mg/l	0.10	SM4500-F-C	15 Dec 16 17:00	SVS
Sulfate	359	mg/l	5.00	ASTM D516-07	20 Dec 16 17:00	KMD
Chloride	4.5	mg/l	1.0	SM4500-Cl-E	16 Dec 16 10:37	KMD
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	20 Dec 16 11:21	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	873	mg/l	10	I1750-85	16 Dec 16 14:43	SVS
Calcium - Total	42.3	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Magnesium - Total	23.6	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Sodium - Total	248	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Potassium - Total	8.7	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	20 Dec 16 10:09	SZ
Boron - Total	0.25	mg/l	0.10	6010	20 Dec 16 12:54	SZ
Calcium - Dissolved	39.4	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Magnesium - Dissolved	22.2	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Sodium - Dissolved	234	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Potassium - Dissolved	8.0	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	20 Dec 16 11:11	SZ
Boron - Dissolved	0.19	mg/l	0.10	6010	20 Dec 16 14:45	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	28 Dec 16 18:11	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Barium - Total	0.0260	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Cadmium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Molybdenum - Total	0.0047	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Selenium - Total	< 0.01 ^	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	29 Dec 16 10:48	CC

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016



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

Report Date: 11 Jan 17
Lab Number: 16-W5955
Work Order #: 82-4047
Account #: 002800
Date Sampled: 13 Dec 16 10:35
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW210

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll

Handwritten signature and date: CC 11 Jan 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:

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 2

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

Report Date: 11 Jan 17  
 Lab Number: 16-W5956  
 Work Order #: 82-4047  
 Account #: 002800  
 Date Sampled: 13 Dec 16 13:30  
 Date Received: 15 Dec 16 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
 Sample Description: MW102

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	15 Dec 16	SVS
pH	* 7.3	units	N/A	SM4500 H+ B	15 Dec 16 17:00	SVS
Total Suspended Solids	12	mg/l	2	I3765-85	15 Dec 16 14:27	SVS
pH - Field	6.93	units	NA	SM 4500 H+ B	13 Dec 16 13:30	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	13 Dec 16 13:30	DJN
Total Alkalinity	362	mg/l CaCO3	20	SM2320-B	15 Dec 16 17:00	SVS
Conductivity - Field	6948	umhos/cm	1	EPA 120.1	13 Dec 16 13:30	DJN
Fluoride	1.68	mg/l	0.10	SM4500-F-C	15 Dec 16 17:00	SVS
Sulfate	5070	mg/l	5.00	ASTM D516-07	20 Dec 16 17:00	KMD
Chloride	53.5	mg/l	1.0	SM4500-Cl-E	16 Dec 16 10:37	KMD
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	20 Dec 16 11:21	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	7310	mg/l	10	I1750-85	16 Dec 16 14:43	SVS
Calcium - Total	284	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Magnesium - Total	1060	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Sodium - Total	194	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Potassium - Total	22.2	mg/l	1.0	6010	16 Dec 16 10:07	SZ
Lithium - Total	< 0.5 @	mg/l	0.10	6010	20 Dec 16 10:09	SZ
Boron - Total	26.3	mg/l	0.10	6010	20 Dec 16 12:54	SZ
Calcium - Dissolved	264	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Magnesium - Dissolved	995	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Sodium - Dissolved	180	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Potassium - Dissolved	20.3	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010	20 Dec 16 11:11	SZ
Boron - Dissolved	24.6	mg/l	0.10	6010	20 Dec 16 14:45	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	28 Dec 16 18:11	CC
Arsenic - Total	0.0022	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Barium - Total	0.0182	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Cadmium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Cobalt - Total	0.0068	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Molybdenum - Total	0.1180	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Selenium - Total	< 0.01 ^	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	29 Dec 16 10:48	CC

RL = Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016





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

Report Date: 11 Jan 17
Lab Number: 16-W5956
Work Order #: 82-4047
Account #: 002800
Date Sampled: 13 Dec 16 13:30
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW102

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by: Claudette K. Carroll 11 JAN 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 2

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

Report Date: 11 Jan 17  
Lab Number: 16-W5957  
Work Order #:82-4047  
Account #: 002800  
Date Sampled: 13 Dec 16 18:15  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
Sample Description: MW118

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	15 Dec 16	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	15 Dec 16 17:00	SVS
Total Suspended Solids	4	mg/l	2	I3765-85	15 Dec 16 14:27	SVS
pH - Field	7.50	units	NA	SM 4500 H+ B	13 Dec 16 18:15	DJN
Temperature - Field	9.75	Degrees C	NA	SM 2550B	13 Dec 16 18:15	DJN
Total Alkalinity	315	mg/l CaCO3	20	SM2320-B	15 Dec 16 17:00	SVS
Conductivity - Field	1695	umhos/cm	1	EPA 120.1	13 Dec 16 18:15	DJN
Fluoride	1.28	mg/l	0.10	SM4500-F-C	15 Dec 16 17:00	SVS
Sulfate	578	mg/l	5.00	ASTM D516-07	20 Dec 16 17:00	KMD
Chloride	19.7	mg/l	1.0	SM4500-CL-E	16 Dec 16 10:37	KMD
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	20 Dec 16 11:21	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	1140	mg/l	10	I1750-85	16 Dec 16 14:43	SVS
Calcium - Total	75.9	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Magnesium - Total	160	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Sodium - Total	84.6	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Potassium - Total	7.5	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	20 Dec 16 10:09	SZ
Boron - Total	2.31	mg/l	0.10	6010	20 Dec 16 12:54	SZ
Calcium - Dissolved	67.2	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Magnesium - Dissolved	143	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Sodium - Dissolved	75.6	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Potassium - Dissolved	6.5	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	20 Dec 16 11:11	SZ
Boron - Dissolved	2.13	mg/l	0.10	6010	20 Dec 16 14:45	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	28 Dec 16 18:11	CC
Arsenic - Total	0.0023	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Barium - Total	0.0321	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Cadmium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Molybdenum - Total	0.0636	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Selenium - Total	0.0745	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	29 Dec 16 10:48	CC

RL = Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016



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

Report Date: 11 Jan 17  
Lab Number: 16-W5957  
Work Order #: 82-4047  
Account #: 002800  
Date Sampled: 13 Dec 16 18:15  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
Sample Description: MW118

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	0.0022 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Barium - Dissolved	0.0254 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Beryllium - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Cobalt - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Molybdenum - Dissolved	0.0584 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Selenium - Dissolved	0.0746 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Thallium - Dissolved	< 0.001 ^ mg/l		0.0005	6020	29 Dec 16 10:48	CC

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* 11 Jan 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 2

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

Report Date: 11 Jan 17
Lab Number: 16-W5958
Work Order #:82-4047
Account #: 002800
Date Sampled: 13 Dec 16 15:35
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW111

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical tests like pH, Total Suspended Solids, Temperature, etc.

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 2

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

Report Date: 11 Jan 17
Lab Number: 16-W5958
Work Order #: 82-4047
Account #: 002800
Date Sampled: 13 Dec 16 15:35
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW111

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll

Handwritten initials and date: CC 11 Jan 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:

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

CERTIFICATION: ND # ND-00016



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Page: 1 of 2

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

Report Date: 11 Jan 17  
 Lab Number: 16-W5959  
 Work Order #: 82-4047  
 Account #: 002800  
 Date Sampled: 14 Dec 16 8:40  
 Date Received: 15 Dec 16 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
 Sample Description: MW117

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	15 Dec 16	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	15 Dec 16 17:00	SVS
Total Suspended Solids	88	mg/l	2	I3765-85	15 Dec 16 14:27	SVS
pH - Field	6.99	units	NA	SM 4500 H+ B	14 Dec 16 8:40	DJN
Temperature - Field	8.30	Degrees C	NA	SM 2550B	14 Dec 16 8:40	DJN
Total Alkalinity	380	mg/l CaCO3	20	SM2320-B	16 Dec 16 17:00	SVS
Conductivity - Field	7879	umhos/cm	1	EPA 120.1	14 Dec 16 8:40	DJN
Fluoride	0.26	mg/l	0.10	SM4500-F-C	15 Dec 16 17:00	SVS
Sulfate	6110	mg/l	5.00	ASTM D516-07	20 Dec 16 17:00	KMD
Chloride	44.0	mg/l	1.0	SM4500-Cl-E	16 Dec 16 10:37	KMD
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	20 Dec 16 11:21	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	28 Dec 16 12:13	EV
Total Dissolved Solids	8550	mg/l	10	I1750-85	16 Dec 16 14:43	SVS
Calcium - Total	392	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Magnesium - Total	1060	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Sodium - Total	535	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Potassium - Total	27.8	mg/l	1.0	6010	16 Dec 16 11:07	SZ
Lithium - Total	< 0.5 @	mg/l	0.10	6010	20 Dec 16 10:09	SZ
Boron - Total	9.85	mg/l	0.10	6010	20 Dec 16 12:54	SZ
Calcium - Dissolved	386	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Magnesium - Dissolved	1040	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Sodium - Dissolved	540	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Potassium - Dissolved	27.4	mg/l	1.0	6010	16 Dec 16 11:49	SZ
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010	20 Dec 16 11:11	SZ
Boron - Dissolved	10.0	mg/l	0.10	6010	20 Dec 16 14:45	SZ
Antimony - Total	< 0.001	mg/l	0.0010	6020	28 Dec 16 18:11	CC
Arsenic - Total	0.0024	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Barium - Total	0.0897	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Cadmium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Chromium - Total	0.0037	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Lead - Total	0.0018	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Molybdenum - Total	0.0045	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Selenium - Total	0.0267	mg/l	0.0020	6020	28 Dec 16 18:11	CC
Thallium - Total	< 0.001 ^	mg/l	0.0005	6020	28 Dec 16 18:11	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	29 Dec 16 10:48	CC

RL = Method Reporting Limit

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 ! = 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: 11 Jan 17
Lab Number: 16-W5959
Work Order #: 82-4047
Account #: 002800
Date Sampled: 14 Dec 16 8:40
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW117

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll 11 Jan 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 sample quantity
# = Due to concentration of other analytes
+ = 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: 11 Jan 17
Lab Number: 16-W5960
Work Order #: 82-4047
Account #: 002800
Date Sampled: 14 Dec 16 12:40
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW103

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical and physical tests such as pH, Total Suspended Solids, Temperature, etc.

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: 11 Jan 17  
Lab Number: 16-W5960  
Work Order #: 82-4047  
Account #: 002800  
Date Sampled: 14 Dec 16 12:40  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR  
Sample Description: MW103

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	0.0031 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Barium - Dissolved	0.0240 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Beryllium - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Cobalt - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Molybdenum - Dissolved	0.0267 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Selenium - Dissolved	0.0598 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Thallium - Dissolved	< 0.001 ^ mg/l		0.0005	6020	29 Dec 16 10:48	CC

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* 11 Jan 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:  
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: = Due to sample quantity + = Due to internal standard response

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

Report Date: 11 Jan 17
Lab Number: 16-W5961
Work Order #: 82-4047
Account #: 002800
Date Sampled: 14 Dec 16 10:10
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW109

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Lists various chemical and physical tests such as pH, Total Suspended Solids, Temperature, etc.

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: 11 Jan 17
Lab Number: 16-W5961
Work Order #: 82-4047
Account #: 002800
Date Sampled: 14 Dec 16 10:10
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: MW109

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll 11 Jan 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 sample quantity
# = Due to concentration of other analytes
+ = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Page: 1 of 2

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

Report Date: 11 Jan 17
Lab Number: 16-W5962
Work Order #:82-4047
Account #: 002800
Date Sampled: 12 Dec 16
Date Received: 15 Dec 16 8:00
Sampled By: MVTl Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: DUP 1

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH, Total Suspended Solids, Total Alkalinity, Fluoride, Sulfate, Chloride, Mercury - Total, Mercury - Dissolved, Total Dissolved Solids, Calcium - Total, Magnesium - Total, Sodium - Total, Potassium - Total, Lithium - Total, Boron - Total, Calcium - Dissolved, Magnesium - Dissolved, Sodium - Dissolved, Potassium - Dissolved, Lithium - Dissolved, Boron - Dissolved, Antimony - Total, Arsenic - Total, Barium - Total, Beryllium - Total, Cadmium - Total, Chromium - Total, Cobalt - Total, Lead - Total, Molybdenum - Total, Selenium - Total, Thallium - Total, Antimony - Dissolved, Arsenic - Dissolved, Barium - Dissolved, Beryllium - Dissolved.

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: 11 Jan 17
Lab Number: 16-W5962
Work Order #: 82-4047
Account #: 002800
Date Sampled: 12 Dec 16
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR
Sample Description: DUP 1

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll 11 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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! = Due to sample quantity
# = Due to concentration of other analytes
+ = 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: 11 Jan 17
Lab Number: 16-W5963
Work Order #: 82-4047
Account #: 002800
Date Sampled: 14 Dec 16
Date Received: 15 Dec 16 8:00
Sampled By: MVTL Field Services

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

Temp at Receipt: 0.7C

Event and Year: December 2016

Table with 7 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical tests like pH, Total Suspended Solids, Fluoride, etc.

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 2

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

Report Date: 11 Jan 17  
Lab Number: 16-W5963  
Work Order #: 82-4047  
Account #: 002800  
Date Sampled: 14 Dec 16  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

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

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Cobalt - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	29 Dec 16 10:48	CC
Molybdenum - Dissolved	< 0.002 mg/l		0.0020	6020	29 Dec 16 10:48	CC
Selenium - Dissolved	< 0.005 ^ mg/l		0.0020	6020	29 Dec 16 10:48	CC
Thallium - Dissolved	< 0.001 ^ mg/l		0.0005	6020	29 Dec 16 10:48	CC

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*CC*  
*11 Jan 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



**Laboratories, Inc.**

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

**Chain of Custody Record**

<b>Project Name:</b> MDU Lewis and Clark CCR Groundwater			Dec <sup>20</sup> cc October 2016 14 Dec 16			<b>Name of Sampler(s):</b> Darren Wiswag		
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829			<b>Carbon Copy:</b> Attn: Address:			<b>Work Order Number:</b> 82-4047		

Sample Information				Bottle Type			Field Parameters			Analysis			
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	500 ml HNO <sub>3</sub> 1 liter	500 ml HNO <sub>3</sub> (filtered)			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
W5953	MW110	12 Dec 16	1510	GW	Up	X X X				10.20	1114	7.33	MDU CCR List with TSS and Dissolved CCR Metals. No RadChem.
W5954	MW119	12 Dec 16	1800	GW	Up	X X X				8.89	1168	7.34	
W5955	MW210	13 Dec 16	1035	GW	Up	X X X				9.27	1430	7.56	
W5956	MW102	13 Dec 16	1330	GW	Down	X X X				10.14	6948	6.93	
W5957	MW118	13 Dec 16	1815	GW	Down	X X X				9.75	1695	7.50	
W5958	MW111	13 Dec 16	1535	GW	Down	X X X				9.80	3230	7.22	
W5959	MW117	14 Dec 16	0840	GW	Down	X X X				8.30	7879	6.99	
W5960	MW103	14 Dec 16	1240	GW		X X X				10.54	1537	7.27	
W5961	MW109	14 Dec 16	1610	GW		X X X				10.12	1614	7.24	
W5962	Dup 1	12 Dec 16	NA	W		X X X				NA	NA	NA	
W5963	Field Blank (FB)	14 Dec 16	NA	W		X X X				NA	NA	NA	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Darren Wiswag		14 Dec 16 1755	Angel [Signature]		13 Dec 16 800	0.7
2							TM 588
3							14 Dec 16 1755





**CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 201682-4070  
**IML Lab Reference No/SDG:** S1612256  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – December 2016 Event  
**MVTL Laboratory Identifications:** 16-W5991 through 16-W6001  
Page 1 of 2

MDU Sample Identification	IML Sample Identification	MVTL Laboratory #
MW110	S1612256-001	16-W5991
MW119	S1612256-002	16-W5992
MW210	S1612256-003	16-W5993
MW102	S1612256-004	16-W5994
MW118	S1612256-005	16-W5995
MW111	S1612256-006	16-W5996
MW117	S1612256-007	16-W5997
MW103	S1612256-008	16-W5998
MW109	S1612256-009	16-W5999
Dup 1	S1612256-010	16-W6000
Field Blank (FB)	S1612256-011	16-W6001

**I. RECEIPT**

- All samples were received at the laboratory on 15 Dec 2016 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 0.7°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 21 Dec 2016.
  - 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.



**CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 201682-4070  
**IML Lab Reference No/SDG:** S1612256  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – December 2016 Event  
**MVTL Laboratory Identifications:** 16-W5991 through 16-W6001  
Page 2 of 2

**III. METHODS**

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

**IV. ANALYSIS**

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 23 Jan 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  
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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  
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Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 23 Jan 17  
 Lab Number: 16-W5991  
 Work Order #: 82-4070  
 Account #: 002800  
 Date Sampled: 12 Dec 16 15:10  
 Date Received: 15 Dec 16 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
 Sample Description: MW110

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.33	units	NA	SM 4500 H+ B	12 Dec 16 15:10	DJN
Temperature - Field	10.2	Degrees C	NA	SM 2550B	12 Dec 16 15:10	DJN
Conductivity - Field	1114	umhos/cm	1	EPA 120.1	12 Dec 16 15:10	DJN
Radium 226	See Attached Report				4 Jan 17	OL
Radium 228	See Attached Report				12 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>CC</sup> 23 Jan 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:  
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CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
Lab Number: 16-W5992  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 12 Dec 16 18:00  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTl Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW119

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34 units	NA	SM 4500 H+ B	12 Dec 16 18:00	DJN
Temperature - Field	8.89 Degrees C	NA	SM 2550B	12 Dec 16 18:00	DJN
Conductivity - Field	1168 umhos/cm	1	EPA 120.1	12 Dec 16 18:00	DJN
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			12 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>CC</sup> 23 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
 Lab Number: 16-W5993  
 Work Order #: 82-4070  
 Account #: 002800  
 Date Sampled: 13 Dec 16 10:35  
 Date Received: 15 Dec 16 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
 Sample Description: MW210

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.56 units	NA	SM 4500 H+ B	13 Dec 16 10:35	DJN
Temperature - Field	9.27 Degrees C	NA	SM 2550B	13 Dec 16 10:35	DJN
Conductivity - Field	1430 umhos/cm	1	EPA 120.1	13 Dec 16 10:35	DJN
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			12 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>IC</sup> 23 JAN 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
Lab Number: 16-W5994  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 13 Dec 16 13:30  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW102

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.93	units	NA	SM 4500 H+ B	13 Dec 16 13:30	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	13 Dec 16 13:30	DJN
Conductivity - Field	6948	umhos/cm	1	EPA 120.1	13 Dec 16 13:30	DJN
Radium 226	See Attached Report				4 Jan 17	OL
Radium 228	See Attached Report				12 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 23 Jan 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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Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 23 Jan 17  
Lab Number: 16-W5995  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 13 Dec 16 18:15  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW118

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.50 units	NA	SM 4500 H+ B	13 Dec 16 18:15	DJN
Temperature - Field	9.75 Degrees C	NA	SM 2550B	13 Dec 16 18:15	DJN
Conductivity - Field	1695 umhos/cm	1	EPA 120.1	13 Dec 16 18:15	DJN
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* *23 Jan 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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! = 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: 23 Jan 17  
Lab Number: 16-W5996  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 13 Dec 16 15:35  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW111

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.22	units	NA	SM 4500 H+ B	13 Dec 16 15:35	DJN
Temperature - Field	9.80	Degrees C	NA	SM 2550B	13 Dec 16 15:35	DJN
Conductivity - Field	3230	umhos/cm	1	EPA 120.1	13 Dec 16 15:35	DJN
Radium 226	See Attached Report				4 Jan 17	OL
Radium 228	See Attached Report				13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>12</sup> 23 Jan 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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Samantha Marshall  
Montana Dakota Utilities  
400 N. 4th  
Bismarck ND 58501

Report Date: 23 Jan 17  
Lab Number: 16-W5997  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 14 Dec 16 8:40  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW117

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.99 units	NA	SM 4500 H+ B	14 Dec 16 8:40	DJN
Temperature - Field	8.30 Degrees C	NA	SM 2550B	14 Dec 16 8:40	DJN
Conductivity - Field	7879 umhos/cm	1	EPA 120.1	14 Dec 16 8:40	DJN
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>cc</sup> 23 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
Lab Number: 16-W5998  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 14 Dec 16 12:40  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW103

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.27	units	NA	SM 4500 H+ B	14 Dec 16 12:40	DJN
Temperature - Field	10.5	Degrees C	NA	SM 2550B	14 Dec 16 12:40	DJN
Conductivity - Field	1537	umhos/cm	1	EPA 120.1	14 Dec 16 12:40	DJN
Radium 226	See Attached Report				4 Jan 17	OL
Radium 228	See Attached Report				13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll 23 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
Lab Number: 16-W5999  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 14 Dec 16 10:10  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW109

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	14 Dec 16 10:10	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	14 Dec 16 10:10	DJN
Conductivity - Field	1614	umhos/cm	1	EPA 120.1	14 Dec 16 10:10	DJN
Radium 226	See Attached Report				4 Jan 17	OL
Radium 228	See Attached Report				13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*23 Jan 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



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

Report Date: 23 Jan 17  
Lab Number: 16-W6000  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 12 Dec 16  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: DUP1

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 23 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 23 Jan 17  
Lab Number: 16-W6001  
Work Order #: 82-4070  
Account #: 002800  
Date Sampled: 14 Dec 16  
Date Received: 15 Dec 16 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: FIELD BLANK

Temp at Receipt: 0.7C

Event and Year: December 2016

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			4 Jan 17	OL
Radium 228	See Attached Report			13 Jan 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 23 Jan 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

CERTIFICATION: ND # ND-00016



Date: 1/18/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201682-4070  
**Lab Order:** S1612256

**CASE NARRATIVE**  
**Report ID:** S1612256001

Samples 16-W5991 MW110, 16-W5992 MW119, 16-W5993 MW210, 16-W5994 MW102, 16-W5995 MW118, 16-W5996 MW111, 16-W5997 MW117, 16-W5998 MW103, 16-W5999 MW109, 16-W6000 Dup 1, and 16-W6001 Field Blank were received on December 21, 2016.

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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-001  
**ClientSample ID:** 16-W5991 MW110  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/12/2016 3:10:00 PM  
**DateReceived:** 12/21/2016 1:12:00 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	01/04/2017 1416	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1416	MB
Radium 228	2.3	pCi/L		1	Ga-Tech	01/12/2017 701	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	01/12/2017 701	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
- 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

- C Calculated Value
- 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

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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-002  
**ClientSample ID:** 16-W5992 MW119  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/12/2016 6:00:00 PM  
**DateReceived:** 12/21/2016 1:12:00 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	01/04/2017 1416	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1416	MB
Radium 228	2.0	pCi/L		1	Ga-Tech	01/12/2017 1627	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	01/12/2017 1627	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
  - 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

- C Calculated Value
- 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

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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-003  
**ClientSample ID:** 16-W5993 MW210  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/13/2016 10:35:00 AM  
**DateReceived:** 12/21/2016 1:12:00 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	01/04/2017 1416	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1416	MB
Radium 228	-0.9	pCi/L		1	Ga-Tech	01/12/2017 1928	MB
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	01/12/2017 1928	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
  - 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

- C Calculated Value
- 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

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



### Sample Analysis Report

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

**Date Reported** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-004  
**ClientSample ID:** 16-W5994 MW102  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/13/2016 1:30:00 PM  
**DateReceived:** 12/21/2016 1:12:00 PM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.7	pCi/L		0.2	SM 7500 Ra-B	01/04/2017 1417	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1417	MB
Radium 228	-0.6	pCi/L		1	Ga-Tech	01/12/2017 2229	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/12/2017 2229	MB

These results apply only to the samples tested.

RL - Reporting Limit

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | 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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-005  
**ClientSample ID:** 16-W5995 MW118  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/13/2016 6:15:00 PM  
**DateReceived:** 12/21/2016 1:12:00 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	01/04/2017 1417	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1417	MB
Radium 228	-0.8	pCi/L		1	Ga-Tech	01/13/2017 130	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/13/2017 130	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
  - 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

- C Calculated Value
- 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

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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-006  
**ClientSample ID:** 16-W5996 MW111  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/13/2016 3:35:00 PM  
**DateReceived:** 12/21/2016 1:12:00 PM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

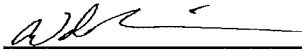
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	01/04/2017 1417	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 1417	MB
Radium 228	0.8	pCi/L		1	Ga-Tech	01/13/2017 432	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/13/2017 432	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
  - 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

- C Calculated Value
- 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

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager



Sample Analysis Report

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

Date Reported 1/18/2017
Report ID S1612256001

ProjectName: 201682-4070
Lab ID: S1612256-007
ClientSample ID: 16-W5997 MW117
COC: 201682-4070

WorkOrder: S1612256
CollectionDate: 12/14/2016 8:40:00 AM
DateReceived: 12/21/2016 1:12:00 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
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

- C Calculated Value
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

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



### Sample Analysis Report

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

**Date Reported** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-008  
**ClientSample ID:** 16-W5998 MW103  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/14/2016 12:40:00 PM  
**DateReceived:** 12/21/2016 1:12:00 PM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

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

**Radionuclides - Total**

Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	01/04/2017 2219 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 2219 MB
Radium 228	0.3	pCi/L		1	Ga-Tech	01/13/2017 1034 MB
Radium 228 Precision (±)	1.7	pCi/L			Ga-Tech	01/13/2017 1034 MB

These results apply only to the samples tested.

**RL - Reporting Limit**

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | 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 1/18/2017
Report ID S1612256001

ProjectName: 201682-4070
Lab ID: S1612256-009
ClientSample ID: 16-W5999 MW109
COC: 201682-4070

WorkOrder: S1612256
CollectionDate: 12/14/2016 10:10:00 AM
DateReceived: 12/21/2016 1:12:00 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
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

- C Calculated Value
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

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



### Sample Analysis Report

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

**Date Reported** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-010  
**ClientSample ID:** 16-W6000 Dup 1  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/12/2016  
**DateReceived:** 12/21/2016 1:12:00 PM  
**FieldSampler:**  
**Matrix:** Water

**Comments**

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

Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	01/04/2017 2219 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 2219 MB
Radium 228	0.6	pCi/L		1	Ga-Tech	01/13/2017 1637 MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/13/2017 1637 MB

These results apply only to the samples tested.

RL - Reporting Limit

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | 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** 1/18/2017  
**Report ID** S1612256001

**ProjectName:** 201682-4070  
**Lab ID:** S1612256-011  
**ClientSample ID:** 16-W6001 Field Blank  
**COC:** 201682-4070

**WorkOrder:** S1612256  
**CollectionDate:** 12/14/2016  
**DateReceived:** 12/21/2016 1:12:00 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	01/04/2017 2219	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	01/04/2017 2219	MB
Radium 228	-1.2	pCi/L		1	Ga-Tech	01/13/2017 1939	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	01/13/2017 1939	MB

These results apply only to the samples tested.

**RL - Reporting Limit**

- |                    |  |  |
|--------------------|--|--|
| <b>Qualifiers:</b> | B Analyte detected in the associated Method Blank      | C Calculated Value                                   |
|                    | E Value above quantitation range                       | H Holding times for preparation or analysis exceeded |
|                    | J Analyte detected below quantitation limits           | L Analyzed by another laboratory                     |
|                    | M Value exceeds Monthly Ave or MCL or is less than LCL | ND Not Detected at the Reporting Limit               |
|                    | O Outside the Range of Dilutions                       | S Spike Recovery outside accepted recovery limits    |
|                    | X Matrix Effect  |  |

Reviewed by:

Wade Nieuwsma, Assistant Laboratory Manager



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.  
Work Order: S1612256  
Project: 201682-4070

Date: 1/18/2017  
Report ID: S1612256001

Radium 228 by Ga/Tech		Sample Type	MBLK	Units: pCi/L			
MB-409 (01/11/17 15:55)	Analyte	RunNo:	142463	PrepDate:	12/21/16 14:00	BatchID	12745
		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-409 (01/11/17 12:53)	Analyte	RunNo:	142463	PrepDate:	12/21/16 14:00	BatchID	12745
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual
Total Radium 228			36		1	39.1	92.7 65.9 - 132

Radium 228 by Ga/Tech		Sample Type	MS	Units: pCi/L			
MS-409 (01/11/17 18:56)	Analyte	RunNo:	142463	PrepDate:	12/21/16 14:00	BatchID	12745
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual
Total Radium 228			36		1	39.1	2 87.5 50 - 139

Radium 228 by Ga/Tech		Sample Type	MSD	Units: pCi/L			
MSD-409 (01/11/17 21:58)	Analyte	RunNo:	142463	PrepDate:	12/21/16 14:00	BatchID	12745
		Result	RL	Conc	%RPD	%REC	% RPD Limits Qual
Total Radium 228			36		1	36	0.887 86.7 20

Radium 226 in Water -		Sample Type	MBLK	Units: pCi/L			
MB-1704 (01/04/17 14:16)	Analyte	RunNo:	142291	PrepDate:	12/21/16 0:00	BatchID	12723
		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-1704 (01/04/17 14:16)	Analyte	RunNo:	142291	PrepDate:	12/21/16 0:00	BatchID	12723
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual
Radium 226			5.8		0.2	5.89	97.6 67.1 - 122

Radium 226 in Water -		Sample Type	MS	Units: pCi/L			
MS-1704 (01/04/17 14:16)	Analyte	RunNo:	142291	PrepDate:	12/21/16 0:00	BatchID	12723
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits Qual
Radium 226			6.0		0.2	5.89	ND 101 65 - 131

Radium 226 in Water -		Sample Type	MSD	Units: pCi/L			
MSD-1704 (01/04/17 14:16)	Analyte	RunNo:	142291	PrepDate:	12/21/16 0:00	BatchID	12723
		Result	RL	Conc	%RPD	%REC	% RPD Limits Qual
Radium 226			6.0		0.2	6.0	0.167 101 20

- Qualifiers:**
- B Analyte detected in the associated Method Blank
  - 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
  - E Value above quantitation range
  - J Analyte detected below quantitation limits
  - ND Not Detected at the Reporting Limit
  - R RPD outside accepted recovery limits
  - X Matrix Effect



**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

201682-4070

Company Name and Address:  <b>MVTL</b> 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  PO Box 249 New Ulm, MN 56073	Name of Sampler: Claudette	E-mail: ccarroll@mvtl.com For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted:
	Project Name/Number:	Purchase Order #: BL5748

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
51612256												
001	16-W5991	MW110 *	GW	12-Dec-16	1510 #	4						Ra226 & Ra228
002	16-W5992	MW119 *	GW	12-Dec-16	1800 #	4						Ra226 & Ra228
003	16-W5993	MW210 *	GW	13-Dec-16	1035 #	4						Ra226 & Ra228
004	16-W5994	MW102 *	GW	13-Dec-16	1330 #	4						Ra226 & Ra228
005	16-W5995	Mw118 *	GW	13-Dec-16	1815 #	4						Ra226 & Ra228
006	16-W5996	MW111 *	GW	13-Dec-16	1535 #	4						Ra226 & Ra228
007	16-W5997	MW117 *	GW	14-Dec-16	840 #	4						Ra226 & Ra228
008	16-W5998	MW103 *	GW	14-Dec-16	1240 #	4						Ra226 & Ra228
009	16-W5999	MW109 *	GW	14-Dec-16	1010 #	4						Ra226 & Ra228
010	16-W6000	Dup 1 *	GW	12-Dec-16		4						Ra226 & Ra228
011	16-W6001	Field Blank *	GW	14-Dec-16		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	19-Dec-16	1700		Kathy Boyd	12.21.16	13:12 11.6'

11.4  
2

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Parrish N. Swaney

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

**Pre Site Calibration**

Date: 12 Dec 16 Time: 0650

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.51</u>	<u>6.90</u>	<u>7.00</u>	6.95-7.05	<u>-48.4</u>	0 +/- 50
Buffer 10	<u>17.28</u>	<u>10.04</u>	<u>10.00</u>	9.95-10.05	<u>-226.7</u>	-180 +/- 50

**Conductivity**

Buffer 1413	Temp °C	Pre Cal	Post Cal	Check
<u>17.05</u>	<u>17.05</u>	<u>1426</u>	<u>1413</u>	±10% Buffer 5000 <u>4970</u>

**ORP**

231 mV @ 25C	Pre Cal	Post Cal	Check
<u>17.60</u>	<u>240.8</u>	<u>231.0</u>	±10 mV

**DO**

Pre Cal	Post Cal	Check
<u>8.08</u>	<u>13.25</u>	<u>11.00</u>

Barometric Pressure (mm Hg) 711.5  
mg/L

**Pre Site Calibration**

Date: 13 Dec 16 Time: 0700

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>17.92</u>	<u>7.05</u>	<u>7.00</u>	6.95-7.05	<u>-50.8</u>	0 +/- 50
Buffer 10	<u>17.32</u>	<u>9.96</u>	<u>10.00</u>	9.95-10.05	<u>-227.1</u>	-180 +/- 50

**Conductivity**

Buffer 1413	Temp °C	Pre Cal	Post Cal	Check
<u>17.47</u>	<u>17.47</u>	<u>1385</u>	<u>1414</u>	±10% Buffer 5000 <u>5011</u>

**ORP**

231 mV @ 25C	Pre Cal	Post Cal	Check
<u>17.60</u>	<u>228.5</u>	<u>231.1</u>	±10 mV

**DO**

Pre Cal	Post Cal	Check
<u>17.58</u>	<u>8.70</u>	<u>8.88</u>

Barometric Pressure (mm Hg) 710.4  
mg/L

**Post Site Check**

Time: 2010

pH	Temp °C	Reading
Buffer 7	<u>7.05</u> <u>8.22</u>	<u>7.05</u>

**Conductivity**

Buffer 1413	Temp °C	Reading
<u>10.15</u>	<u>10.15</u>	<u>1423</u>

**Post Site Check**

Time: 1935

pH	Temp °C	Reading
Buffer 7	<u>13.58</u>	<u>7.04</u>

**Conductivity**

Buffer 1413	Temp °C	Reading
<u>14.34</u>	<u>14.34</u>	<u>1422</u>

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren A. [Signature]

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date: <u>14 Dec 16</u>		Time: <u>0700</u>				
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7	<u>18.50</u>	<u>7.05</u>	<u>6.99</u>	6.95-7.05	<u>-53.6</u>
Buffer 10	<u>18.64</u>	<u>9.97</u>	<u>10.00</u>	9.95-10.05	<u>-238.6</u>	-180 +/- 50
Conductivity						Check
	Buffer 1413	<u>19.69</u>	<u>1398</u>	<u>1403</u>	±10%	Buffer 5000
ORP						
	231 mV @ 25C	<u>189.2</u>	<u>229.1</u>	<u>231.1</u>	±10 mV	
DO						
		<u>19.33</u>	<u>9.53</u>	<u>8.42</u>	Barometric Pressure (mm Hg)	mg/L

Post Site Calibration						
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
Conductivity						Check
	Buffer 1413			±10%	Buffer 5000	
ORP						
	231 mV @ 25C			±10 mV		
DO						
				Barometric Pressure (mm Hg)	mg/L	

Post Site Check		
Time: <u>1250</u>		
pH	Temp °C	Reading
Buffer 7	<u>10.16</u>	<u>7.02</u>
Conductivity		
	Buffer 1413	<u>10.20</u>

Post Site Check		
Time:		
pH	Temp °C	Reading
Buffer 7		
Conductivity		
	Buffer 1413	



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Water Level

Sampling Personnel:

Darren Nieswray

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	17 Dec 11	1115	Dry	
West Scrubber Pond Gauge	14 Dec 11	1114	6.30	
Stream behind Sewage Lagoon	14 Dec 16	1345	0.51	



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Nieswag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	12 Dec 16	1133	9.28	
MW105	12 Dec 16	1155	8.99	
MW106	12 Dec 16	1153	9.67	
MW107	12 Dec 16	1131	4.41	
MW108	12 Dec 16	1150	16.72	
MW116	12 Dec 16	1145	10.68	



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW110  
Sampling Personal: Darren Wiesway

Weather Conditions: Temp: 6 °F Wind: WNW 11 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:	9.31	ft	
Total Well Depth:	16.95	ft	
Well Volume:	4.8	liters	
Depth to Top of Pump:	13.52	ft	
Water Level After Sample:	9.44	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"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI:	
Duplicate Sample ID:		Pumping Rate:	100 mL/min
Purge Date:	12 Dec 16	Time Purging Began:	1310 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry:	
Sample Date:	12 Dec 16	Time of Sampling:	1510 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1330		10.10	1112	7.33	2.44	164.5	76.1	9.39	1500	Slightly turbid
3	1345		10.63	1113	7.32	2.33	157.7	35.8	9.46	1500	ST
4	1400		11.25	1114	7.32	2.23	152.1	12.2	9.41	1500	clear
5	1415		10.94	1114	7.32	2.23	151.8	8.95	9.41	1500	clear
6	1430		10.85	1113	7.32	2.21	145.6	6.88	9.44	1500	clear
7	1445		10.13	1111	7.32	2.24	138.0	5.53	9.42	1500	clear
8	1500		9.94	1113	7.33	2.22	134.3	4.98	9.41	1500	clear
9	1505		10.07	1113	7.32	2.20	133.5	4.85	9.48	500	clear
10	1510		10.20	1114	7.33	2.20	133.0	4.78	9.48	500	clear

Stabilized: Yes No  
Comments:

Total Volume Removed: 12,000 mL





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW 119  
Sampling Personal: Darren Nieswong

Weather Conditions: Temp: 4 °F Wind: NW 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:	<u>9.87</u>	ft
Total Well Depth:	<u>16.65</u>	ft
Well Volume:	<u>24.95</u> <del>4.8</del>	liters
Depth to Top of Pump:	<u>13.31</u>	ft
Water Level After Sample:	<u>9.21</u>	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>    </u>
Duplicate Sample ID:	<u>Dup 1</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>12 Dec 16</u>	Time Purging Began: <u>1700</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>12 Dec 16</u>	Time of Sampling: <u>1800</u> am/pm
Bottle	<u>2 - 500 mL Nitric</u>	<u>2 - 1 Liter Raw</u>
List:	<u>2 - 500 mL Nitric (filtered)</u>	<u>4 - 1 Liter Nitric</u>

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid	
1	1705	<u>8.89</u>	<u>1148</u>	<u>7.30</u>	<u>3.18</u>	<u>142.5</u>	<u>19.9</u>	<u>9.21</u>	<u>500</u>	<u>cl</u>
2	1720	<u>8.80</u>	<u>1159</u>	<u>7.32</u>	<u>2.16</u>	<u>104.4</u>	<u>10.7</u>	<u>9.21</u>	<u>1500</u>	<u>cl</u>
3	1735	<u>8.95</u>	<u>1166</u>	<u>7.32</u>	<u>1.65</u>	<u>43.4</u>	<u>6.10</u>	<u>9.21</u>	<u>1500</u>	<u>cl</u>
4	1745	<u>8.92</u>	<u>1170</u>	<u>7.33</u>	<u>1.53</u>	<u>27.8</u>	<u>4.06</u>	<u>9.21</u>	<u>1500</u>	<u>cl</u>
5	1750	<u>9.01</u>	<u>1169</u>	<u>7.34</u>	<u>1.050</u>	<u>25.8</u>	<u>3.21</u>	<u>9.21</u>	<u>500</u>	<u>cl</u>
6	1755	<u>8.92</u>	<u>1170</u>	<u>7.34</u>	<u>1.53</u>	<u>24.0</u>	<u>3.04</u>	<u>9.21</u>	<u>500</u>	<u>cl</u>
7	1800	<u>8.89</u>	<u>1168</u>	<u>7.34</u>	<u>1.51</u>	<u>23.3</u>	<u>2.95</u>	<u>9.21</u>	<u>500</u>	<u>cl</u>
8										
9										
10										

Stabilized: Yes No  
Comments:     

Total Volume Removed: 6500 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2016

Sample ID: nw210

Sampling Personal: Darren Nieswaj

Weather Conditions: Temp: 5 °F Wind: sw 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:	9.34	ft
Total Well Depth:	35.47	ft
Well Volume:	16cl	liters
Depth to Top of Pump:	29.91	ft
Water Level After Sample:	11.65	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings	
Sampling Method:	Bladder	Purge:	5 sec.
Dedicated Equip?:	Yes <input type="checkbox"/> No <input checked="" 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:	13 Dec 16	Time Purging Began:	0915 am/pm
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry:	am/pm
Sample Date:	13 Dec 16	Time of Sampling:	1035 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	0920	9.59	1505	7.72	5.32	-77.6	17.9	10.48	500	Slightly turbid
2	0935	9.14	1467	7.57	1.72	-27.4	4.61	11.26	1500	clear
3	0950	9.47	1471	7.57	1.28	-56.8	19.2	11.57	1500	clear
4	1005	9.45	1473	7.58	1.07	-55.4	5.52	11.57	1500	clear
5	1015	9.78	1473	7.57	0.97	-57.0	4.84	11.61	1000	clear
6	1020	9.76	1472	7.57	0.96	-58.7	4.78	11.59	500	clear
7	1025	9.69	1472	7.57	0.95	-60.8	3.50	11.59	500	clear
8	1030	9.60	1468	7.56	0.94	-63.0	3.31	11.61	500	clear
9	1035	9.27	1430	7.56	0.94	-63.8	3.24	11.61	500	clear
10										

Stabilized:  Yes  No

Total Volume Removed: 6,000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2016

Sample ID: MW 102

Sampling Personal: Darren N. [Signature]

Weather Conditions: Temp: 10 °F Wind: W 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:	18.80	ft	
Total Well Depth:	24.70	ft	
Well Volume:	3.7	liters	
Depth to Top of Pump:	20.37	ft	
Water Level After Sample:	19.18	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"/>	Recover: 55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: —
Duplicate Sample ID:	—	Pumping Rate: 100 mL/min
Purge Date:	13 Dec 16	Time Purging Began: 11:45 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/>	Time Purged Dry: <del>8:45</del> am/pm
Sample Date:	13 Dec 16	Time of Sampling: 1:30 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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.
1	11.50	10.27	6835	6.91	2.46	28.9	19.18	500	clear
2	12.05	10.46	6864	6.93	0.99	0.0	19.18	1500	clear
3	12.20	10.39	6850	6.93	0.82	-7.0	19.18	1500	clear
4	12.35	10.54	6862	6.92	0.69	-10.3	19.18	1500	clear
5	12.50	10.43	6884	6.93	0.68	-10.3	19.18	1500	clear
6	13.05	10.41	6895	6.93	0.66	-13.9	19.18	1500	clear
7	13.20	10.15	6930	6.93	0.65	-15.1	19.18	1500	clear
8	13.25	10.26	6943	6.93	0.64	-15.4	19.18	500	clear
9	13.30	10.14	6948	6.93	0.61	-15.6	19.18	500	clear
10									

Stabilized:  Yes  No

Total Volume Removed: 9,000 mL

Comments:





# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW11  
Sampling Personal: DARRIN RESWAAG

Weather Conditions: Temp: 13 °F Wind: NW 16 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"/>	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	8.05	ft	
Total Well Depth:	17.81	ft	
Well Volume:	6.1	liters	
Depth to Top of Pump:	13.38	ft	
Water Level After Sample:	8.10	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:	
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	13 Dec 16	Time Purging Began:	1440	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	
Sample Date:	13 Dec 16	Time of Sampling:	1535	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1445	14.29	3403	7.14	1.34	24.6	25.7	8.08	500	clr
2	1500	10.02	3249	7.19	2.22	45.2	14.3	8.10	1500	clr
3	1515	9.87	3240	7.21	2.26	56.1	7.01	8.10	1500	clr
4	1520	9.93	3239	7.22	2.27	61.4	2.22	8.10	500	clr
5	1525	9.89	3239	7.22	2.28	61.8	1.45	8.10	500	clr
6	1530	9.89	3230	7.22	2.28	63.4	1.41	8.10	500	clr
7	1535	9.80	3230	7.22	2.26	64.9	1.35	8.10	500	clr
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 5500 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2016  
 Sample ID: MW117  
 Sampling Personal: Darra Nieswazy

Weather Conditions: Temp: 5 °F Wind: NW 5 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" 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:	<input checked="" type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	4.94	ft
Total Well Depth:	11.51	ft
Well Volume:	4.1	liters
Depth to Top of Pump:	8.09	ft
Water Level After Sample:	8.09 Top of pump	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 3 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: 57 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: -
Duplicate Sample ID:		Pumping Rate: 100 mL/min
Purge Date:	12 Dec 16	Time Purging Began: 1210 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: <del>1245</del> am/pm
Sample Date:	13 Dec 16	Time of Sampling: 0820 am/pm
	14 Dec 16	0840 am
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1215	7.69	7857	7.14	8.61	216.9	154	6.40	500	slightly turbid
2	1225	8.05	7858	7.17	7.57	210.7	126	7.15	1000	ST
3	1235	7.73	7814	7.13	7.20	204.9	85.6	7.62	1000	ST
4	1245	8.14	7846	7.13	6.99	200.8	214.0	8.00	1000	ST
5	1250	8.07	7841	7.11	6.61	193.0	204	8.09	1000	ST
6										13 Dec 16 started to purge
7	0815							6.10		purge for 5 min to clear
8	0820	8.20	8134	7.46	8.01	93.7	101	6.82	500	ST
9	0835							6.22		purge line 14 Dec 16
10	0840	8.30	7879	6.99	9.10	188.6	67.5	6.72	500	ST

Stabilized: Yes  No

Total Volume Removed: 3500 mL

Comments:

4500



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: NW103  
Sampling Personal: Darren Nieswong

Weather Conditions: Temp: -2 °F Wind: NW 9 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:	2"	
Water Level Before Purge:	<u>10.73</u>	ft
Total Well Depth:	<u>21.15</u>	ft
Well Volume:	<u>6.5</u>	liters
Depth to Top of Pump:	<u>17.18</u>	ft
Water Level After Sample:	<u>10.76</u>	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 <u>No</u>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <u>No</u>	PSI: _____
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>14 Dec 16</u>	Time Purging Began: <u>11:20</u> am/pm
Well Purged Dry?	Yes <u>No</u>	Time Purged Dry: _____ am/pm
Sample Date:	<u>14 Dec 16</u>	Time of Sampling: <u>12:40</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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									
1	<u>11:25</u>	<u>11.32</u>	<u>2270</u>	<u>7.24</u>	<u>1.50</u>	<u>78.0</u>	<u>92.5</u>	<u>500</u>	<u>slightly turbid</u>	
2	<u>11:40</u>	<u>11.35</u>	<u>1660</u>	<u>7.25</u>	<u>1.00</u>	<u>76.5</u>	<u>47.1</u>	<u>1500</u>	<u>clear</u>	
3	<u>11:50</u>	<u>10.76</u>	<u>1592</u>	<u>7.26</u>	<u>0.93</u>	<u>77.9</u>	<u>21.3</u>	<u>10.76</u>	<u>1500</u>	<u>clear</u>
4	<u>12:10</u>	<u>10.74</u>	<u>1548</u>	<u>7.26</u>	<u>0.83</u>	<u>77.6</u>	<u>12.6</u>	<u>10.76</u>	<u>1500</u>	<u>clear</u>
5	<u>12:25</u>	<u>10.61</u>	<u>1544</u>	<u>7.27</u>	<u>0.77</u>	<u>76.3</u>	<u>5.43</u>	<u>10.76</u>	<u>1500</u>	<u>clear</u>
6	<u>12:30</u>	<u>10.46</u>	<u>1557</u>	<u>7.27</u>	<u>0.78</u>	<u>76.0</u>	<u>4.47</u>	<u>10.76</u>	<u>500</u>	<u>clear</u>
7	<u>12:35</u>	<u>10.41</u>	<u>1541</u>	<u>7.27</u>	<u>0.73</u>	<u>75.4</u>	<u>4.80</u>	<u>10.76</u>	<u>500</u>	<u>clear</u>
8	<u>12:40</u>	<u>10.54</u>	<u>1537</u>	<u>7.27</u>	<u>0.72</u>	<u>75.0</u>	<u>4.75</u>	<u>10.76</u>	<u>500</u>	<u>clear</u>
9										
10										

Stabilized: Yes No

Total Volume Removed: 8000 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2016  
Sample ID: MW109  
Sampling Personal: *Darren Nieswag*

Weather Conditions: Temp: *-5* °F Wind: *W7* 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:	10.68	ft	
Total Well Depth:	17.04	ft	
Well Volume:	4.0	liters	
Depth to Top of Pump:	13.31	ft	
Water Level After Sample:	10.77	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:	
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	14 Dec 16	Time Purging Began:	0915	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	
Sample Date:	14 Dec 16	Time of Sampling:		am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter Nitric		

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	0935	9.73	1611	7.24	1.08	174.1	14.0	10.74	1500	cl
3	0950	9.89	1610	7.24	0.91	150.0	6.11	10.77	1500	cl
4	0955	10.11	1614	7.24	0.91	142.9	3.70	10.76	500	cl
5	1000	10.21	1615	7.24	0.90	138.3	1.71	10.75	500	cl
6	1005	10.20	1613	7.24	0.89	135.0	1.75	10.76	500	cl
7	1010	10.12	1614	7.24	0.87	130.5	1.80	10.77	500	cl
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: *6500* mL





**Laboratories, Inc.**

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

**Chain of Custody Record**

<b>Project Name:</b> MDU Lewis and Clark CCR Radiochem			Dec @cc 14 Dec 16 October 2016	<b>Name of Sampler(s):</b> Darren Nieswaag
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829		<b>Carbon Copy:</b> Attn: Address:		<b>Work Order Number:</b> 82-4070

Sample Information						Bottle Type				Field Parameters			Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO <sub>3</sub>					Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
WS991	MW110	12 Dec 16	1510	GW	Up	4					10.20	1114	7.33	MDU CCR combined
WS992	MW119	12 Dec 16	1800	GW	Up	4					8.89	1168	7.34	RadChem
WS993	MW210	13 Dec 16	1035	GW	Up	4					9.27	1430	7.56	
WS994	MW102	13 Dec 16	1330	GW	Down	4					10.14	6948	6.93	
WS995	MW118	13 Dec 16	1815	GW	Down	4					9.75	1695	7.50	
WS996	MW111	13 Dec 16	1535	GW	Down	4					9.80	3230	7.22	
WS997	MW117	14 Dec 16	0840	GW	Down	4					8.30	7879	6.99	
WS998	MW103	14 Dec 16	1240	GW		4					10.54	1537	7.27	
WS999	MW109	14 Dec 16	1010	GW		4					10.12	1614	7.24	
AS @ 16 Dec 16 WS999600	Dup 1	12 Dec 16	NA	W		4					NA	NA	NA	
WS999600	Field Blank (FB)		NA	W		4					NA	NA	NA	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	Don Nieswaag	Walkin 2	14 Dec 16 1755	Angel Simonson		15 Dec 16 8:00 am	0.7
2							TM 588
3							14 Dec 16 1755



**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.mvttl.com



March 17, 2017

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

RE: Groundwater Sampling Event - 2017 at MDU Lewis & Clark Site

Dear Ms. Marshall:

It was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the corrected Field Data Report.

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

Sincerely,

Jeremy Meyer  
MVTL Field Services



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Lewis and Clark**  
CCR Sampling

WO# 82-0309  
82-0310

Attn: Samantha Marshall  
400 North 4th St  
Bismarck, ND 58501

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	TOTAL DEPTH (FT)	WATER LEVEL END (FT)	VOLUME IN WELL (Liters)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE
											TEMP (°C)	EC	pH	Turb. NTU	
MW110	6-Feb-17	12:52	6-Feb-17	14:57	9.42	16.95	9.71	4.6	12500.0	Bladder	6.69	1118	7.37	4.51	clear
MW119	6-Feb-17	15:49	6-Feb-17	16:54	9.42	16.65	9.45	4.5	6500.0	Bladder	6.38	1204	7.36	4.57	clear
MW210	6-Feb-17	17:50	6-Feb-17	18:40	9.66	35.43	NR	15.9	5000.0	Bladder	6.46	1465	7.65	4.12	clear
MW102	7-Feb-17	10:20	7-Feb-17	12:45	18.32	24.70	19.28	3.9	14500.0	Bladder	10.06	6912	6.81	4.88	clear
MW118	7-Feb-17	16:10	7-Feb-17	17:25	8.82	11.90	8.90	1.9	7500.00*	Bladder	5.34	1672	7.45	4.87	clear
MW111	7-Feb-17	14:00	7-Feb-17	14:55	8.07	17.81	8.27	6.0	6000.0	Bladder	7.62	3178	7.13	2.83	clear
MW117	6-Feb-17	11:58	7-Feb-17	8:40	6.30	11.51	8.09	3.2	4500.0	Bladder	4.52	8425	6.97	33.80	clear
MW103	8-Feb-17	10:40	8-Feb-17	11:45	10.78	21.15	10.99	6.4	6500.0	Bladder	9.16	1560	7.30*	3.38	clear
MW109	8-Feb-17	8:40	8-Feb-17	9:30	10.82	17.04	10.91	3.8	5000.0	Bladder	7.80	1663	7.29	1.32	clear
MW101	NA	NA	6-Feb-17	11:34	9.50	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW105	NA	NA	6-Feb-17	11:46	9.13	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW106	NA	NA	6-Feb-17	11:44	9.74	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW107	NA	NA	6-Feb-17	11:32	4.53	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW108	NA	NA	6-Feb-17	11:42	17.06	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level
MW116	NA	NA	6-Feb-17	11:37	11.29	NA	NA	NA	NA	WL	NA	NA	NA	NA	Water Level

NR= Not Recorded NA = Not Applicable

\*ammended due to typing or calculation error



**MINNESOTA VALLEY TESTING LABORATORIES, INC.**

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



February 10, 2017

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

RE: Groundwater Sampling Event - 2017 at MDU Lewis & Clark Site

Dear Ms. Marshall:

From February 6-8, 2017, MVTL Laboratories' Field Services division collected ground water samples at the MDU Lewis & Clark Station near Sidney, MT. The wells were sampled for CCR analysis, dissolved metals, and TSS. Samples were collected from 9 wells. A duplicate sample was also collected at well MW103. The wells were located, and were found to be in generally good condition. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer  
MVTL Field Services

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Niesway

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	6 Feb 17		Time:	0712		
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	19.18	6.92	7.00	6.95-7.05	-59.0	0 +/- 50
Buffer 10	19.20	10.01	10.00	9.95-10.05	-210.7	-180 +/- 50
Conductivity						Check
Buffer 1413	18.83	1408	1413	±10%	Buffer 5000	5041
ORP						
231 mV @ 25C	8.44	235.6	231.1	±10 mV		
DO						
	11.08	<del>10.97</del>	10.16			
				Barometric Pressure (mm Hg)		
				mg/L	704.3	

Pre Site Calibration						
Date:	7 Feb 17		Time:	0735		
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	20.17	6.97	7.00	6.95-7.05	-63.7	0 +/- 50
Buffer 10	19.70	9.99	10.00	9.95-10.05	-235.6	-180 +/- 50
Conductivity						Check
Buffer 1413	20.09	1429	1414	±10%	Buffer 5000	4987
ORP						
231 mV @ 25C	19.84	224.8	231.0	±10 mV		
DO						
	21.55	6.87	8.20			
				Barometric Pressure (mm Hg)		
				mg/L	707.3	

Post Site Check		
Time:	0810	
pH	Temp °C	Reading
Buffer 7	7.04	7.04
	15.24	
Conductivity		
Buffer 1413	15.20	1423

Post Site Check		
Time:	0705	
pH	Temp °C	Reading
Buffer 7	9.58	6.97
Conductivity		
Buffer 1413	9.58	1424

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren McElwain

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	Time:					
	<u>9 Feb 17</u>	<u>0700</u>				
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>19.46</u>	<u>6.96</u>	<u>6.99</u>	6.95-7.05	<u>-53.1</u>	0 +/- 50
Buffer 10	<u>19.26</u>	<u>10.04</u>	<u>9.99</u>	9.95-10.05	<u>-22.8</u>	-180 +/- 50
Conductivity					Check	
Buffer 1413	<u>19.44</u>	<u>1396</u>	<u>1413</u>	±10%	Buffer 5000	<u>4985</u>
ORP						
231 mV @ 25C	<u>19.18</u>	<u>237.1</u>	<u>237.1</u>	±10 mV		
DO					Barometric Pressure (mm Hg)	
	<u>20.82</u>	<u>9.18</u>	<u>8.35</u>	mg/L	<u>712.5</u>	

Post Site Check		
Time:		
	<u>1230</u>	
pH	Temp °C	Reading
Buffer 7	<u>10.13</u>	<u>302</u>
Conductivity		
Buffer 1413	<u>9.70</u>	<u>1419</u>

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
Conductivity					Check	
Buffer 1413				±10%	Buffer 5000	
ORP						
231 mV @ 25C				±10 mV		
DO					Barometric Pressure (mm Hg)	
				mg/L		

Time:		
pH	Temp °C	Reading
Buffer 7		
Conductivity		
Buffer 1413		



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Niles Wrag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	6 Feb 17	1134	9.50	
MW105	6 Feb 17	1146	9.13	
MW106	6 Feb 17	1144	9.74	
MW107	6 Feb 17	1132	4.53	
MW108	6 Feb 17	1142	17.06	
MW116	6 Feb 17	1137	11.29	



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Niswamy

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	8 Feb 17	1051	Dry	-
West Scrubber Pond Gauge	8 Feb 17	1052	5.58	
Stream behind Sewage Lagoon	8 Feb 17	0818	0.35	





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW110  
Sampling Personal: Darren Wiesmeyer

Weather Conditions: Temp: 10 °F Wind: NE 13 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:	9.42	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	14.19	ft
Water Level After Sample:	9.71	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 type="checkbox"/> No <input checked="" type="checkbox"/>	Recover: <u>135</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>    </u>
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>6 Feb 17</u>	Time Purging Began: <u>7252</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>6 Feb 17</u>	Time of Sampling: <u>1457</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	1257	628	1146	7.40	6.21	130.6	179	9.71	500	Turbid
2	1317	6.69	1119	7.38	3.60	120.3	49.4	9.71	2000	sk clear
3	1337	6.69	1119	7.35	3.24	112.4	26.3	9.71	2000	clear
4	1357	6.69	1119	7.36	3.09	107.1	19.5	9.71	2000	clear
5	1417	6.70	1119	7.38	2.96	104.4	13.4	9.71	2000	clear
6	1437	6.78	1118	7.36	2.86	102.6	6.31	9.71	2000	clear
7	1442	6.85	1119	7.37	2.95	101.7	5.03	9.71	2050	clear
8	1447	6.86	1090	7.37	2.93	101.4	4.72	9.71	500	clear
9	1452	6.77	1118	7.37	2.90	100.7	4.68	9.71	500	clear
10	1457	6.69	1118	7.37	2.86	100.6	4.51	9.71	500	clear

Stabilized:  Yes  No

Total Volume Removed: 13500 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2017

Sample ID: *22W19*

Sampling Personal: *Lauren Nieswag*

Weather Conditions: Temp: *8* °F Wind: *NE 13* 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	<i>9.42</i>	ft	
Total Well Depth:	<i>-</i>	ft	
Well Volume:	<i>-</i>	liters	
Depth to Top of Pump:	<i>13.39</i>	ft	
Water Level After Sample:	<i>9.45</i>	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings
Sampling Method:	Bladder		Purge: <i>5</i> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover: <i>55</i> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI: <i>-</i>
Duplicate Sample ID:	<i>-</i>		Pumping Rate: <i>0.0</i> mL/min
Purge Date:	<i>6 Feb 17</i>	Time Purging Began:	<i>1549</i> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry: <i>-</i> am/pm
Sample Date:	<i>6 Feb 17</i>	Time of Sampling:	<i>1654</i> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter Nitric	

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	<i>1514</i>	<i>6.34</i>	<i>1201</i>	<i>7.33</i>	<i>2.23</i>	<i>86.0</i>	<i>13.4</i>	<i>9.49</i>	<i>500</i>	<i>clear</i>
3	<i>1634</i>	<i>6.25</i>	<i>1202</i>	<i>7.35</i>	<i>1.99</i>	<i>45.6</i>	<i>6.05</i>	<i>9.49</i>	<i>2000</i>	<i>clear</i>
4	<i>1644</i>	<i>6.37</i>	<i>1203</i>	<i>7.35</i>	<i>1.95</i>	<i>21.8</i>	<i>4.90</i>	<i>9.49</i>	<i>1000</i>	<i>clear</i>
5	<i>1649</i>	<i>6.38</i>	<i>1203</i>	<i>7.35</i>	<i>1.95</i>	<i>28.2</i>	<i>4.78</i>	<i>9.49</i>	<i>500</i>	<i>clear</i>
6	<i>1654</i>	<i>6.38</i>	<i>1204</i>	<i>7.36</i>	<i>1.94</i>	<i>24.2</i>	<i>4.57</i>	<i>9.49</i>	<i>500</i>	<i>clear</i>
7										
8										
9										
10										

Stabilized? Yes No

Total Volume Removed: 6500 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 210  
Sampling Personal: Darren Nieswazy

Weather Conditions: Temp: 8 °F Wind: NE 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"/>	Not Visible
Repairs Necessary:	<input checked="" type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	9.66	ft
Total Well Depth:	-	ft
Well Volume:	-	liters
Depth to Top of Pump:	28.33	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:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		PSI:	-
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	6 Feb 17	Time Purging Began:	1750	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	-	am/pm
Sample Date:	6 Feb 17	Time of Sampling:	1840	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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 #
	1755	4.65	1450	7.75	7.28	103.8	20.2	10.62	500	clear
	1810	6.00	1473	7.71	2.35	88.6	9.22	11.38	1500	cl
	1820	6.41	1465	7.67	1.59	61.9	6.74	11.56	1000	cl
	1825	6.44	1463	7.66	1.48	36.7	4.78	11.61	500	cl
	1830	6.24	1462	7.65	1.39	6.0	4.42	11.63	500	cl
	1835	6.45	1461	7.65	1.37	2.4	4.40	11.65	500	cl
	1840	6.46	1465	7.65	1.70	-2.4	4.12	11.64	500	cl

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 5000 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 102  
Sampling Personal: Darren Niebuhr

Weather Conditions: \_\_\_\_\_ Temp: 3 °F Wind: NW 5 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:	18.32	ft
Total Well Depth:	_____	
Well Volume:	_____ liters	
Depth to Top of Pump:	20.68	ft
Water Level After Sample:	19.28	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input type="checkbox"/> No <input checked="" 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:	7 Feb 17	Time Purging Began:	1020	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	_____	am/pm
Sample Date:	7 Feb 17	Time of Sampling:	1245	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1025	7.43	6829	6.81	5.12	117.4	19.18	500	Turbid
2	1055	9.80	6825	6.81	2.58	48.0	19.22	<del>2500</del> 7000	Turbid
3	1125	10.25	6810	6.81	2.63	37.7	19.22	3000	clear
4	1140	10.07	6855	6.81	2.40	32.8	19.28	1500	clear
5	1210	10.05	6882	6.81	2.63	33.5	19.28	3000	clear
6	1225	10.01	6903	6.81	2.28	31.4	19.28	1500	clear
7	1235	10.07	6913	6.81	2.47	31.3	19.28	1000	clear
8	1240	10.09	6912	6.81	2.48	31.2	19.28	500	clear
9	1245	10.06	6912	6.81	2.44	31.0	19.28	500	clear
10									

Stabilized:  Yes  No

Total Volume Removed: 14,500 mL

Comments:

Had pump in overnight and next morning pump wasn't working so changed it. That is why turbidity started so high.



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 118  
Sampling Personal: Darren Niesmaas

Weather Conditions: Temp: 0 °F Wind: N/E 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:	8.82	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	9.89	ft	
Water Level After Sample:	8.90	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	Recover: 5% sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: -
Duplicate Sample ID:	-	Pumping Rate: 100 mL/min
Purge Date:	7 Feb 17	Time Purging Began: 1610 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/>	Time Purged Dry: am/pm
Sample Date:	7 Feb 17	Time of Sampling: 1725 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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								
1	1615	5.29	1652	6.10	85.9	7000	8.87	500	Turbid
2	1645	5.45	1661	7.43 7.45	83.1	24.5	8.90	2000	clear
3	1700	5.35	1661	7.44	83.4	11.5	8.90	1500	clear
4	1710	5.30	1667	7.44	83.1	7.03	8.90	1000	clear
5	1715	5.35	1673	7.45	82.5	4.83	8.90	500	clear
6	1720	5.38	1667	7.45	82.2	4.74	8.90	500	clear
7	1725	5.34	1672	7.45	82.5	4.87	8.50	500	clear
8	1730								
9									
10									

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 6500 mL

Had trouble with the pump at the beginning and changed it, check ball was sticking, that is why it is turbid at the beginning



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: MW 11  
 Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 2 °F Wind: NS 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:	8.07	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	13.38	ft
Water Level After Sample:	8.27	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>4</u> sec.
Dedicated Equip?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>-</u>
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>7 Feb 17</u>	Time Purging Began: <u>1400</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>7 Feb 17</u>	Time of Sampling: <u>6450</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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.
SEQ #	Time								clear, slightly turbid, turbid
1	1405	7.04	3983	6.86	4.59	73.4	8.27	500	slightly turbid
2	1425	7.39	3282	7.08	2.67	81.0	8.27	2500	clear
3	1435	7.47	3206	7.11	2.98	82.5	8.27	1000	clear
4	1440	7.35	3190	7.12	3.11	83.2	8.27	500	clear
5	1445	7.56	3177	7.13	3.25	84.1	8.27	500	clear
6	1450	7.58	3178	7.13	3.27	84.3	8.27	500	clear
7	1455	7.62	3178	7.13	3.29	84.6	8.27	500	clear
8									
9									
10									

Stabilized: Yes No

Total Volume Removed: 6000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 117  
Sampling Personal: Darren Willway

Weather Conditions: Temp: -6 °F Wind: NW5 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	6.30		ft
Total Well Depth:	-		ft
Well Volume:	-		liters
Depth to Top of Pump:	8.09		ft
Water Level After Sample:	8.09	Top	ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: 56 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: -
Duplicate Sample ID:		Pumping Rate: 100 mL/min
Purge Date:	6 Feb 17	Time Purging Began: 1158 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: 1238 am/pm
Sample Date:	7 Feb 17	Time of Sampling: 0840 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	1203	5.95	8217	7.02	8.76	194.2	160	6.30	500	Turbid
2	1213	5.14	8130	7.07	8.37	185.7	121	6.91	1000	Turbid
3	1223	4.90	8046	7.08	7.93	164.7	71.5	7.81	1000	Slightly turbid
4	1238	5.09	7931	7.10	7.99	154.9	84.9	8.09	1500	ST
5								6.52		
6	0835							6.52		
7	0840	4.52	8425	6.97	9.65	217.4	33.8	6.81	500	clear
8										
9										
10										

Stabilized: Yes  No   
Comments:

Total Volume Removed: 4000 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW103  
Sampling Personal: Darren Nieswary

Weather Conditions: Temp: °F 0 Wind: W7 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:	10.28	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	17.86	ft	
Water Level After Sample:	10.99	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 40-4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: 50-54 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: Orange Box
Duplicate Sample ID:	Dup-1	Pumping Rate: 600 mL/min
Purge Date:	8 Feb 17	Time Purging Began: 10:40 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: am/pm
Sample Date:	8 Feb 17	Time of Sampling: 11:45 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	1045	7.93	3546	7.26	4.71	102.2	92.5	10.98	500	slightly turbid
2	1105	8.21	1720	7.31	1.66	89.6	14.9	10.99	2000	clear
3	1120	8.52	1643	7.31	1.38	86.2	8.56	10.99	1500	clear
4	1125	8.48	1604	7.31	1.21	84.3	5.74	10.99	500	clear
5	1130	8.59	1595	7.31	1.17	84.4	4.24	10.99	500	clear
6	1135	9.09	1572	7.30	1.06	83.5	3.40	10.99	500	clear
7	1140	9.06	1564	7.30	1.02	83.4	3.62	10.99	500	clear
8	1145	9.16	1560	7.30	1.04	83.0	3.38	10.99	500	clear
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 6500 mL





# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW109  
Sampling Personal: Parren Nieswong

Weather Conditions: \_\_\_\_\_ Temp: -9 °F Wind: SW 5 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>10.82</u>	ft	
Total Well Depth:	<u>-</u>	ft	
Well Volume:	<u>-</u>	liters	
Depth to Top of Pump:	<u>13.92</u>	ft	
Water Level After Sample:	<u>10.91</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>4</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	<u>56</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	<u>-</u>
Duplicate Sample ID:	<u>-</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>8 Feb 17</u>	Time Purging Began:	<u>0840</u>	<u>am/pm</u>
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	<u>-</u> am/pm
Sample Date:	<u>8 Feb 17</u>	Time of Sampling:	<u>0930</u>	<u>am/pm</u>
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	<u>0845</u>		<u>5.77</u>	<u>1712</u>	<u>7.18</u>	<u>4.38</u>	<u>126.4</u>	<u>17.8</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
2	<u>080910</u>		<u>7.02</u>	<u>1667</u>	<u>7.26</u>	<u>2.68</u>	<u>101.3</u>	<u>4.60</u>	<u>10.89</u>	<u>2500</u>	<u>cl</u>
3	<u>0915</u>		<u>7.51</u>	<u>1664</u>	<u>7.27</u>	<u>2.06</u>	<u>96.0</u>	<u>2.25</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
4	<u>0920</u>		<u>7.74</u>	<u>1668</u>	<u>7.29</u>	<u>1.61</u>	<u>90.8</u>	<u>1.26</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
5	<u>0925</u>		<u>7.72</u>	<u>1665</u>	<u>7.29</u>	<u>1.60</u>	<u>90.6</u>	<u>1.31</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
6	<u>0930</u>		<u>7.80</u>	<u>1663</u>	<u>7.29</u>	<u>1.58</u>	<u>90.1</u>	<u>1.32</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
7											
8											
9											
10											

Stabilized: (Yes) No  
Comments: (circled)

Total Volume Removed: 5000 mL



CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201782-0310
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater – February 2017 Event
MVTL Laboratory Identifications: 17-W298 through 17-W308
Page 1 of 2

Table with 2 columns: MDU Sample Identification, MVTL Laboratory #. Rows include MW110, MW119, MW210, MW102, MW118, MW111, MW117, MW103, MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 9 Feb 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 0.2°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).



CASE NARRATIVE

-MVTl Lab Reference No/SDG: 201782-0310
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater - February 2017 Event
MVTl Laboratory Identifications: 17-W298 through 17-W308
Page 2 of 2

- o For some metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
o One alkalinity 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.
o One selenium total 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.
o The recoveries for three selenium total matrix spikes/matrix spike duplicates 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.
o One selenium dissolved 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.
o The recoveries for one selenium dissolved matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
o One lead dissolved 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.
o The recoveries for one lithium total 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.
o Recovery for one fluoride matrix spike was outside of the acceptable limits. Recovery of the matrix spike duplicate was acceptable. RPD for the recoveries of the matrix spike/matrix spike duplicate was acceptable. No further action was taken.

All laboratory data has been approved by MVTl Laboratories.

SIGNED: Claudette Carroll DATE: 28 FEB 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.mvttl.com



Page: 1 of 2

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

Report Date: 22 Feb 17  
Lab Number: 17-W298  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 6 Feb 17 14:57  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW110  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.4	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	4	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	7.37	units	NA	SM 4500 H+ B	6 Feb 17 14:57	DJN
Temperature - Field	6.69	Degrees C	NA	SM 2550B	6 Feb 17 14:57	DJN
Total Alkalinity	332	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	1118	umhos/cm	1	EPA 120.1	6 Feb 17 14:57	DJN
Fluoride	0.47	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	214	mg/l	5.00	ASTM D516-07	10 Feb 17 8:53	EMS
Chloride	21.2	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	636	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	92.6	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Total	57.3	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Total	88.3	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Total	6.7	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	15 Feb 17 14:15	KMD
Boron - Total	0.20	mg/l	0.10	6010	14 Feb 17 10:31	KMD
Calcium - Dissolved	88.2	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	54.6	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	84.3	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	6.4	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	0.19	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 9:50	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Barium - Total	0.0304	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Molybdenum - Total	0.0039	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 10:50	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

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 2

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

Report Date: 22 Feb 17
Lab Number: 17-W298
Work Order #: 82-0310
Account #: 002800
Date Sampled: 6 Feb 17 14:57
Date Received: 9 Feb 17 8:00
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater
Sample Description: MW110
Sample Site: MDU Lewis & Clark
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

Table with 7 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, Time, Analyst. Lists various metals and their detection results.

\* Holding time exceeded

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

Approved by:

Handwritten signature: Claudette K. Carroll 28 FEB 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 2

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

Report Date: 22 Feb 17
Lab Number: 17-W299
Work Order #:82-0310
Account #: 002800
Date Sampled: 6 Feb 17 16:54
Date Received: 9 Feb 17 8:00
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater
Sample Description: MW119
Sample Site: MDU Lewis & Clark
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Lists various chemical tests and results such as pH, Total Suspended Solids, Calcium, Magnesium, etc.

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 2

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

Report Date: 22 Feb 17  
Lab Number: 17-W299  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 6 Feb 17 16:54  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW119  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0331	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	0.0007	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0041	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	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> *28 FEB 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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Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 22 Feb 17  
 Lab Number: 17-W300  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 6 Feb 17 18:40  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW210  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.8	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	6	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	7.65	units	NA	SM 4500 H+ B	6 Feb 17 18:40	DJN
Temperature - Field	6.46	Degrees C	NA	SM 2550B	6 Feb 17 18:40	DJN
Total Alkalinity	374	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	1465	umhos/cm	1	EPA 120.1	6 Feb 17 18:40	DJN
Fluoride	0.98	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	349	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	3.8	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	893	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	46.5	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Total	25.7	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Total	276	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Total	9.2	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	15 Feb 17 14:15	KMD
Boron - Total	0.17	mg/l	0.10	6010	14 Feb 17 10:31	KMD
Calcium - Dissolved	43.1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	24.0	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	256	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	8.5	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	0.17	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 9:50	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Barium - Total	0.0230	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Molybdenum - Total	0.0043	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

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: 22 Feb 17  
Lab Number: 17-W300  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 6 Feb 17 18:40  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW210  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0256	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0038	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* *28 FEB 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:

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

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Page: 1 of 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W301  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 6 Feb 17 12:45  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW102  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.4	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	11	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	6.81	units	NA	SM 4500 H+ B	7 Feb 17 12:45	DJN
Temperature - Field	10.1	Degrees C	NA	SM 2550B	7 Feb 17 12:45	DJN
Total Alkalinity	365	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	6912	umhos/cm	1	EPA 120.1	7 Feb 17 12:45	DJN
Fluoride	1.73	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	4700	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	56.2	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	7340	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	324	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	1190	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	216	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	24.4	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	< 0.5 @	mg/l	0.10	6010	15 Feb 17 14:15	KMD
Boron - Total	25.3	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	304	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	1120	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	203	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	23.1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	25.5	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 9:50	KMD
Arsenic - Total	0.0026	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Barium - Total	0.0270	mg/l	0.0020	6020	15 Feb 17 17:45	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 9:50	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Cobalt - Total	0.0062	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Molybdenum - Total	0.1156	mg/l	0.0020	6020	14 Feb 17 9:50	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	15 Feb 17 17:45	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

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 2

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

Report Date: 22 Feb 17  
Lab Number: 17-W301  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 6 Feb 17 12:45  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW102  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0195	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	0.0065	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.1094	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

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

Approved by:

*Cc*  
Claudette K Carroll 28 Feb 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 2

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

Report Date: 22 Feb 17
Lab Number: 17-W302
Work Order #:82-0310
Account #: 002800
Date Sampled: 6 Feb 17 17:25
Date Received: 9 Feb 17 8:00
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater
Sample Description: MW118
Sample Site: MDU Lewis & Clark
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Lists various chemical tests such as pH, Total Suspended Solids, and various metals.

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 2

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

Report Date: 22 Feb 17
Lab Number: 17-W302
Work Order #:82-0310
Account #: 002800
Date Sampled: 6 Feb 17 17:25
Date Received: 9 Feb 17 8:00
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater
Sample Description: MW118
Sample Site: MDU Lewis & Clark
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

Table with 6 columns: Analyte, As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Lists various elements like Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Molybdenum, Selenium, and Thallium with their respective results and analysis dates.

\* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
28 FEB 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 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W303  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 6 Feb 17 14:55  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW111  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	3	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	7.13	units	NA	SM 4500 H+ B	7 Feb 17 14:55	DJN
Temperature - Field	7.62	Degrees C	NA	SM 2550B	7 Feb 17 14:55	DJN
Total Alkalinity	366	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	3178	umhos/cm	1	EPA 120.1	7 Feb 17 14:55	DJN
Fluoride	2.17	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	1530	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	28.6	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	2640	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	150	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	418	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	123	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	9.5	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	0.18	mg/l	0.10	6010	15 Feb 17 14:15	KMD
Boron - Total	7.10	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	145	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	404	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	116	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	9.2	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	0.18	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	7.09	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Total	0.0193	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Total	0.0659	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Total	0.1027	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

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: 22 Feb 17  
Lab Number: 17-W303  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 6 Feb 17 14:55  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW111  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0198	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0768	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	0.1019	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*cc*  
*28 FEB 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 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W304  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 7 Feb 17 8:40  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW117  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.6	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	39	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	6.97	units	NA	SM 4500 H+ B	7 Feb 17 8:40	DJN
Temperature - Field	4.52	Degrees C	NA	SM 2550B	7 Feb 17 8:40	DJN
Total Alkalinity	385	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	8425	umhos/cm	1	EPA 120.1	7 Feb 17 8:40	DJN
Fluoride	0.23	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	5670	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	45.4	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	8730	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	453	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	1220	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	605	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	28.4	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	< 0.5 @	mg/l	0.10	6010	15 Feb 17 14:15	KMD
Boron - Total	8.75	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	430	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	1160	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	570	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	26.9	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.5 @	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	8.96	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Total	0.0051	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Total	0.2388	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Total	0.0006	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Total	0.0110	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Total	0.0048	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Total	0.0063	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Total	0.0040	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Total	0.0321	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

RL = Method Reporting Limit

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

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CERTIFICATION: ND # ND-00016





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

Report Date: 22 Feb 17  
Lab Number: 17-W304  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 7 Feb 17 8:40  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW117  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0182	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0040	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	0.0340	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

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

Report Date: 22 Feb 17  
 Lab Number: 17-W305  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 8 Feb 17 11:45  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW103  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	5	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
pH - Field	7.40	units	NA	SM 4500 H+ B	8 Feb 17 11:45	DJN
Temperature - Field	9.16	Degrees C	NA	SM 2550B	8 Feb 17 11:45	DJN
Total Alkalinity	302	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Conductivity - Field	1560	umhos/cm	1	EPA 120.1	8 Feb 17 11:45	DJN
Fluoride	0.80	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	484	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	18.8	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:56	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	1060	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	92.5	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	138	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	85.6	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	8.1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Total	1.60	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	89.2	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	133	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	83.0	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	7.9	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	1.70	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	0.0050	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Total	0.0032	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Total	0.0270	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Total	0.0262	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Total	0.0705	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Antimony - Dissolved	0.0050	mg/l	0.0010	6020	14 Feb 17 15:05	KMD

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



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Page: 2 of 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W305  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 8 Feb 17 11:45  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: MW103  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	0.0034 mg/l		0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0237 mg/l		0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002 mg/l		0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0277 mg/l		0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	0.0721 mg/l		0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

Approved by: Claudette K Carroll *CC* *28 FEB 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:  
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 ! = Due to sample quantity + = Due to internal standard response

CERTIFICATION: ND # ND-00016



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Page: 1 of 2

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

Report Date: 22 Feb 17
Lab Number: 17-W306
Work Order #: 82-0310
Account #: 002800
Date Sampled: 8 Feb 17 9:30
Date Received: 9 Feb 17 8:00
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater
Sample Description: MW109
Sample Site: MDU Lewis & Clark
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Lists various chemical tests and their results.

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 2

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

Report Date: 22 Feb 17  
Lab Number: 17-W306  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 8 Feb 17 9:30  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: MW109  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Arsenic - Dissolved	0.0030	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0243	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	0.0021	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0287	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	0.0829	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>cc</sup> 28 FEB 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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Samantha Marshall  
 Montana Dakota Utilities  
 400 N. 4th  
 Bismarck ND 58501

Report Date: 22 Feb 17  
 Lab Number: 17-W307  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 8 Feb 17  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: DUP 1  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 7.7	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	7	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
Total Alkalinity	302	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Fluoride	0.81	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	489	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	18.6	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:55	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	1060	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	92.9	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	140	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	85.2	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	8.1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Total	1.47	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	92.2	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	137	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	85.4	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	8.1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	1.62	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	0.0048	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Total	0.0031	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Total	0.0239	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Total	0.0258	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Total	0.0670	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Antimony - Dissolved	0.0054	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Dissolved	0.0030	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	0.0272	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

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 2

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

Report Date: 22 Feb 17  
Lab Number: 17-W307  
Work Order #: 82-0310  
Account #: 002800  
Date Sampled: 8 Feb 17  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
Sample Description: DUP 1  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	0.0315	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	0.0610	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*28 FEB 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 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W308  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 8 Feb 17  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: Field Blank (FB)  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	9 Feb 17	SVS
pH	* 6.0	units	N/A	SM4500 H+ B	9 Feb 17 17:00	SVS
Total Suspended Solids	< 2	mg/l	2	I3765-85	9 Feb 17 15:44	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	9 Feb 17 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	9 Feb 17 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	10 Feb 17 9:09	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	9 Feb 17 11:55	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 11:56	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	15 Feb 17 12:42	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	10 Feb 17 10:45	SVS
Calcium - Total	< 1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Magnesium - Total	< 1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Sodium - Total	< 1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Potassium - Total	< 1	mg/l	1.0	6010	20 Feb 17 12:33	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	14 Feb 17 11:31	KMD
Calcium - Dissolved	< 1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Magnesium - Dissolved	< 1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Sodium - Dissolved	< 1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Potassium - Dissolved	< 1	mg/l	1.0	6010	20 Feb 17 11:33	KMD
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	15 Feb 17 16:15	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	14 Feb 17 12:31	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Total	< 0.004	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Feb 17 15:05	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Barium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

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 2

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

Report Date: 22 Feb 17  
 Lab Number: 17-W308  
 Work Order #: 82-0310  
 Account #: 002800  
 Date Sampled: 8 Feb 17  
 Date Received: 9 Feb 17 8:00  
 Sampled By: Client

Project Name: MDU Lewis & Clark CCR Groundwater  
 Sample Description: Field Blank (FB)  
 Sample Site: MDU Lewis & Clark  
 Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020	14 Feb 17 15:05	KMD
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	15 Feb 17 12:15	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Feb 17 15:05	KMD

\* Holding time exceeded

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

Approved by:

*C*  
*Claudette K. Carroll* *28 FEB 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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## Quality Control Report

Lab IDs: 17-W298 to 17-W308

Project: MDU Lewis & Clark CCR  
Groundwater

Work Order: 201782-0310

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
Boron - Total mg/l	0.40	100	80-120	0.400	17-W261	0.35	0.77	105	75-125	0.77	0.76	102	1.3	20	-	-	< 0.1
	0.40	100	80-120	0.400	17-W265	0.36	0.78	105	75-125	0.78	0.78	105	0.0	20	-	-	< 0.1
	0.40	100	80-120	0.400	17-W298	0.20	0.61	102	75-125	0.61	0.63	108	3.2	20	-	-	< 0.1
				0.400	17-W308	< 0.1	0.38	95	75-125	0.38	0.39	98	2.6	20	-	-	< 0.1
Cadmium - Dissolved mg/l	0.1000	107	80-120	0.100	17W307Q	< 0.0005	0.1042	104	75-125	0.1042	0.0883	88	16.5	20	-	-	< 0.0005
				0.100	17W308q	< 0.0005	0.1089	109	75-125	0.1089	0.1109	111	1.8	20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000	111	80-120	0.400	17W261q	< 0.0005	0.4442	111	75-125	0.4442	0.4384	110	1.3	20	-	-	< 0.0005
	0.1000	107	80-120	0.400	17W265q	< 0.0005	0.4220	106	75-125	0.4220	0.4144	104	1.8	20	-	-	< 0.0005
				0.400	17W298q	< 0.0005	0.4126	103	75-125	0.4126	0.4240	106	2.7	20	-	-	< 0.0005
				0.400	17W308q	< 0.0005	0.4268	107	75-125	0.4268	0.4340	108	1.7	20	-	-	< 0.0005
Calcium - Dissolved mg/l	20.0	107	80-120	500	17-W301	304	840	107	75-125	840	775	94	8.0	20	-	-	< 1
				100	17-W308	< 1	99.1	99	75-125	99.1	106	106	6.7	20	-	-	< 1
Calcium - Total mg/l	20.0	107	80-120	500	17-D388	152	685	107	75-125	685	635	97	7.6	20	-	-	< 1
	20.0	108	80-120	100	17-W300	46.5	149	102	75-125	149	150	104	0.7	20	-	-	< 1
	20.0	107	80-120	500	17W323q	463	990	105	75-125	990	960	99	3.1	20	-	-	< 1
															-	-	< 1
Chloride mg/l	30.0	84	80-120	30.0	17-W265	8.1	35.7	92	80-120	35.7	37.5	98	4.9	20	-	-	< 1
	30.0	83	80-120												-	-	< 1
	30.0	83	80-120												-	-	
	30.0	86	80-120												-	-	
Chromium - Dissolved mg/l	0.1000	95	80-120	0.100	17W307Q	< 0.002	0.0908	91	75-125	0.0908	0.0771	77	16.3	20	-	-	< 0.002
				0.100	17W308q	< 0.002	0.0973	97	75-125	0.0973	0.0994	99	2.1	20	-	-	< 0.002



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MEMBER  
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## Quality Control Report

Lab IDs: 17-W298 to 17-W308

Project: MDU Lewis & Clark CCR  
Groundwater

Work Order: 201782-0310

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium - Total mg/l	0.1000 0.1000	100 95	80-120 80-120	0.400 0.400 0.400 0.400	17W261q	< 0.002	0.3930	98	75-125	0.3930	0.3812	95	3.0	20	-	-	< 0.002
					17W265q	0.0039	0.3728	92	75-125	0.3728	0.3756	93	0.7	20	-	-	< 0.002
					17W298q	< 0.002	0.3724	93	75-125	0.3724	0.3728	93	0.1	20	-	-	< 0.002
					17W308q	< 0.002	0.3762	94	75-125	0.3762	0.3798	95	1.0	20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.1000	96	80-120	0.100 0.100	17W307Q	< 0.002	0.0922	92	75-125	0.0922	0.0784	78	16.2	20	-	-	< 0.002
					17W308q	< 0.002	0.0989	99	75-125	0.0989	0.1012	101	2.3	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000 0.1000	102 96	80-120 80-120	0.400 0.400 0.400 0.400	17W261q	< 0.002	0.3978	99	75-125	0.3978	0.3882	97	2.4	20	-	-	< 0.002
					17W265q	< 0.002	0.3806	95	75-125	0.3806	0.3836	96	0.8	20	-	-	< 0.002
					17W298q	< 0.002	0.3802	95	75-125	0.3802	0.3802	95	0.0	20	-	-	< 0.002
					17W308q	< 0.002	0.3864	97	75-125	0.3864	0.3890	97	0.7	20	-	-	< 0.002
Fluoride mg/l	0.50	104	90-110	0.500	17-W298	0.47	0.96	98	80-120	0.96	0.97	100	1.0	20	-	-	< 0.1
				0.500	17-W301	1.73	2.12	78	80-120	2.12	2.14	82	0.9	20	-	-	< 0.1
Lead - Dissolved mg/l	0.1000	95	80-120	0.100 0.100	17W307Q	< 0.0005	0.0878	88	75-125	0.0878	0.0740	74	17.1	20	-	-	< 0.0005
					17W308q	< 0.0005	0.0988	99	75-125	0.0988	0.1038	104	4.9	20	-	-	< 0.0005
Lead - Total mg/l	0.1000 0.1000	96 95	80-120 80-120	0.400 0.400 0.400 0.400	17W308q	< 0.0005	0.3772	94	75-125	0.3772	0.3816	95	1.2	20	-	-	< 0.0005
					17-W261	< 0.0005	0.3708	93	75-125	0.3708	0.3724	93	0.4	20	-	-	< 0.0005
					17-W265	0.0009	0.3776	94	75-125	0.3776	0.3730	93	1.2	20	-	-	< 0.0005
					17-W298	< 0.0005	0.3734	93	75-125	0.3734	0.3964	99	6.0	20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.40 0.40	100 100	80-120 80-120	0.200 0.200	17-W300	0.04	0.27	115	75-125	0.27	0.28	120	3.6	20	-	-	< 0.1
					17-W308	< 0.1	0.17	85	75-125	0.17	0.18	90	5.7	20	-	-	< 0.1
Lithium - Total mg/l	0.40 0.40	102 100	80-120 80-120	0.200	17-W261	0.12	0.37	125	75-125	0.37	0.36	120	2.7	20	-	-	< 0.1
				0.400	17-W265	0.14	0.71	142	75-125	0.71	0.72	145	1.4	20	-	-	< 0.1
				0.400	17-W298	0.04	0.54	125	75-125	0.54	0.54	125	0.0	20	-	-	< 0.1
				0.200	17-W265	0.14	0.39	125	75-125	0.39	0.39	125	0.0	20	-	-	< 0.1
				0.400	17-W308	< 0.1	0.38	95	75-125	0.38	0.39	98	2.6	20	-	-	< 0.1
										0.30	0.28	98	6.9	20	-	-	< 0.1





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## Quality Control Report

Lab IDs: 17-W298 to 17-W308

Project: MDU Lewis & Clark CCR  
Groundwater

Work Order: 201782-0310

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
Potassium - Total mg/l	10.0	99	80-120	100	17-D388	53.0	160	107	75-125	160	148	95	7.8	20	-	-	< 1
	10.0	99	80-120	20.0	17-W300	9.2	29.6	102	75-125	29.6	29.9	104	1.0	20	-	-	< 1
	10.0	98	80-120	100	17W323q	25.4	132	107	75-125	132	128	103	3.1	20	-	-	< 1
															-	-	< 1
Selenium - Dissolved mg/l	0.1000	111	80-120	0.100	17-W307	0.0610	0.1848	124	75-125	0.1848	0.1906	130	3.1	20	-	-	< 0.002
				0.100	17-W308	< 0.002	0.1312	131	75-125	0.1312	0.1354	135	3.2	20	-	-	< 0.002
Selenium - Total mg/l	0.1000	109	80-120	0.400	17-W261	< 0.002	0.4762	119	75-125	0.4762	0.4884	122	2.5	20	-	-	< 0.002
	0.1000	111	80-120	0.400	17-W265	< 0.002	0.5202	130	75-125	0.5202	0.5302	133	1.9	20	-	-	< 0.002
	0.1000	110	80-120	0.400	17-W298	0.0025	0.5122	127	75-125	0.5122	0.5498	137	7.1	20	-	-	< 0.002
				0.100	17-W307Q	0.0610	0.1848	124	75-125	0.1848	0.1906	130	3.1	20	-	-	< 0.002
				0.400	17-W308	< 0.002	0.5362	134	75-125	0.5362	0.5344	134	0.3	20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0	104	80-120	500	17-W301	203	740	107	75-125	740	675	94	9.2	20	-	-	< 1
				100	17-W308	< 1	98.0	98	75-125	98.0	104	104	5.9	20	-	-	< 1
Sodium - Total mg/l	20.0	104	80-120	500	17-D388	750	1280	106	75-125	1280	1200	90	6.5	20	-	-	< 1
	20.0	106	80-120	100	17-W300	276	360	84	75-125	360	358	82	0.6	20	-	-	< 1
	20.0	104	80-120	500	17W323q	735	1240	101	75-125	1240	1220	97	1.6	20	-	-	< 1
															-	-	< 1
Sulfate mg/l	100	108	80-120	1000	17-W261	875	1750	88	80-120	1750	1750	88	0.0	20	-	-	< 5
	100	99	80-120	100	17-W308	< 5	95.7	96	80-120	95.7	97.5	98	1.9	20	-	-	< 5
				500	17-W282	239	684	89	80-120	684	697	92	1.9	20	-	-	< 5
Thallium - Dissolved mg/l	0.1000	97	80-120	0.100	17W307Q	< 0.0005	0.0904	90	75-125	0.0904	0.0758	76	17.6	20	-	-	< 0.0005
				0.100	17W308q	< 0.0005	0.1014	101	75-125	0.1014	0.1066	107	5.0	20	-	-	< 0.0005

**Quality Control Report**

Lab IDs: 17-W298 to 17-W308

Project: MDU Lewis & Clark CCR  
 Groundwater

Work Order: 201782-0310

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Thallium - Total mg/l	0.1000	97	80-120	0.400	17W308q	< 0.0005	0.3934	98	75-125	0.3934	0.3958	99	0.6	20	-	-	< 0.0005
	0.1000	97	80-120	0.400	17-W261	< 0.0005	0.3796	95	75-125	0.3796	0.3812	95	0.4	20	-	-	< 0.0005
				0.400	17-W265	< 0.0005	0.3796	95	75-125	0.3796	0.3826	96	0.8	20	-	-	
				0.400	17-W298	< 0.0005	0.3826	96	75-125	0.3826	0.4000	100	4.4	20	-	-	
Total Alkalinity mg/l CaCO3	410	91	90-110	410	17-D387	566	924	87	80-120	924	927	88	0.3	20	91	80-120	< 20
				410	17-W300	374	700	80	80-120	700	699	79	0.1	20		< 20	
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1060	1060	-	0.0	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	< 10	< 10	-	0.0	*	-	-	< 10
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	131	128	-	2.3	20	-	-	< 2
	-	-	-	-	-	-	-	-	-	7	6	-	15.4	*	-	-	

\* Due to result < 10 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 3 mg/L.

Approved by: C. Campbell  
 28 Feb 17



**Laboratories, Inc.**

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

**Chain of Custody Record**

<b>Project Name:</b> MDU Lewis and Clark CCR Groundwater 2017				<b>Name of Sampler(s):</b> <i>Darren Nieswaag</i>				
<b>Report To:</b> MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829			<b>Carbon Copy:</b> Attn: Address:			<b>Work Order Number:</b> <i>82-0310</i>		

Sample Information				Bottle Type				Field Parameters			Analysis			
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	500 ml HNO <sub>3</sub>	1 liter	500 ml HNO <sub>3</sub> (filtered)			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
<i>W298</i>	MW110	<i>6 Feb 17</i>	<i>1457</i>	GW	Up	X	X	X			<i>6.69</i>	<i>1118</i>	<i>7.37</i>	MDU CCR List with TSS and Dissolved CCR Metals. No RadChem.
<i>W299</i>	MW119	<i>6 Feb 17</i>	<i>1654</i>	GW	Up	X	X	X			<i>6.38</i>	<i>1204</i>	<i>7.36</i>	
<i>W300</i>	MW210	<i>6 Feb 17</i>	<i>1840</i>	GW	Up	X	X	X			<i>6.46</i>	<i>1465</i>	<i>7.65</i>	
<i>W301</i>	MW102	<i>7 Feb 17</i>	<i>1245</i>	GW	Down	X	X	X			<i>10.06</i>	<i>6912</i>	<i>6.81</i>	
<i>W302</i>	MW118	<i>7 Feb 17</i>	<i>1725</i>	GW	Down	X	X	X			<i>5.34</i>	<i>1672</i>	<i>7.45</i>	
<i>W303</i>	MW111	<i>7 Feb 17</i>	<i>1455</i>	GW	Down	X	X	X			<i>7.62</i>	<i>3178</i>	<i>7.63</i>	
<i>W304</i>	MW117	<i>7 Feb 17</i>	<i>0840</i>	GW	Down	X	X	X			<i>4.52</i>	<i>8425</i>	<i>6.97</i>	
<i>W305</i>	MW103	<i>8 Feb 17</i>	<i>1145</i>	GW		X	X	X			<i>9.16</i>	<i>1560</i>	<i>7.40</i>	
<i>W306</i>	MW109	<i>8 Feb 17</i>	<i>0930</i>	GW		X	X	X			<i>7.80</i>	<i>1663</i>	<i>7.29</i>	
<i>W307</i>	Dup 1	<i>8 Feb 17</i>	NA	W		X	X	X			NA	NA	NA	
<i>W308</i>	Field Blank (FB)	<i>8 Feb 17</i>	NA	W		X	X	X			NA	NA	NA	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	°C
1	<i>Dan Meyer</i>	<i>walk in 2</i>	<i>8 Feb 17 1748</i>	<i>Angel Simon</i>		<i>09 FEB 17 800</i>	<i>ROB 0.2</i>
2							<i>TM 562</i>
3							<i>8 Feb 17 on</i>





CASE NARRATIVE

MVTl Lab Reference No/SDG: 201782-0309
IML Lab Reference No/SDG: S1702125
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater – February 2017 Event
MVTl Laboratory Identifications: 17-W287 through 17-W297
IM Laboratory Identifications: S1702125-001 through S1702125-011
Page 1 of 2

Table with 3 columns: MDU Sample Identification, IML Sample Identification, and MVTL Laboratory #. Rows include MW110 through MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 9 Feb 17 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 0.2°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.
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.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-0309  
IML Lab Reference No/SDG: S1702125  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: CCR Groundwater – February 2017 Event  
MVTL Laboratory Identifications: 17-W287 through 17-W297  
IM Laboratory Identifications: S1702125-001 through S1702125-011  
Page 2 of 2

III. METHODS

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

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 8 Mar 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



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

Report Date: 7 Mar 17  
Lab Number: 17-W287  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 6 Feb 17 14:57  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW110  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.37 units	NA	SM 4500 H+ B	6 Feb 17 14:57	DJN
Temperature - Field	6.69 Degrees C	NA	SM 2550B	6 Feb 17 14:57	DJN
Conductivity - Field	1118 umhos/cm	1	EPA 120.1	6 Feb 17 14:57	DJN
Radium 226	See Attached Report			21 Feb 17	OL
Radium 228	See Attached Report			18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*8 Mar 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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Samantha Marshall  
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400 N. 4th  
Bismarck ND 58501

Report Date: 7 Mar 17  
Lab Number: 17-W288  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 6 Feb 17 16:54  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW119  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.36	units	NA	SM 4500 H+ B	6 Feb 17 16:54	DJN
Temperature - Field	6.38	Degrees C	NA	SM 2550B	6 Feb 17 16:54	DJN
Conductivity - Field	1204	umhos/cm	1	EPA 120.1	6 Feb 17 16:54	DJN
Radium 226	See Attached Report				21 Feb 17	OL
Radium 228	See Attached Report				18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K Carroll* <sup>CC</sup> *8 Mar 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 7 Mar 17  
Lab Number: 17-W289  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 6 Feb 17 18:40  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW210  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.65	units	NA	SM 4500 H+ B	6 Feb 17 18:40	DJN
Temperature - Field	6.46	Degrees C	NA	SM 2550B	6 Feb 17 18:40	DJN
Conductivity - Field	1465	umhos/cm	1	EPA 120.1	6 Feb 17 18:40	DJN
Radium 226	See Attached Report				21 Feb 17	OL
Radium 228	See Attached Report				18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* 8 Mar 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 7 Mar 17  
Lab Number: 17-W290  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 7 Feb 17 12:45  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW102  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.81 units	NA	SM 4500 H+ B	7 Feb 17 12:45	DJN
Temperature - Field	10.1 Degrees C	NA	SM 2550B	7 Feb 17 12:45	DJN
Conductivity - Field	6912 umhos/cm	1	EPA 120.1	7 Feb 17 12:45	DJN
Radium 226	See Attached Report			21 Feb 17	OL
Radium 228	See Attached Report			18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll <sup>CC</sup> 8 Mar 17  
Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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

Report Date: 7 Mar 17  
Lab Number: 17-W291  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 7 Feb 17 17:25  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW118  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.45 units	NA	SM 4500 H+ B	7 Feb 17 17:25	DJN
Temperature - Field	5.34 Degrees C	NA	SM 2550B	7 Feb 17 17:25	DJN
Conductivity - Field	1672 umhos/cm	1	EPA 120.1	7 Feb 17 17:25	DJN
Radium 226	See Attached Report			21 Feb 17	OL
Radium 228	See Attached Report			18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 8 MAR 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 7 Mar 17  
Lab Number: 17-W292  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 7 Feb 17 14:55  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW111  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.13	units	NA	SM 4500 H+ B	7 Feb 17 14:55	DJN
Temperature - Field	7.62	Degrees C	NA	SM 2550B	7 Feb 17 14:55	DJN
Conductivity - Field	3178	umhos/cm	1	EPA 120.1	7 Feb 17 14:55	DJN
Radium 226	See Attached Report				21 Feb 17	OL
Radium 228	See Attached Report				18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* 8 Mar 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016





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Samantha Marshall  
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400 N. 4th  
Bismarck ND 58501

Report Date: 7 Mar 17  
Lab Number: 17-W293  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 7 Feb 17 8:40  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW117  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.97 units	NA	SM 4500 H+ B	7 Feb 17 8:40	DJN
Temperature - Field	4.52 Degrees C	NA	SM 2550B	7 Feb 17 8:40	DJN
Conductivity - Field	8425 umhos/cm	1	EPA 120.1	7 Feb 17 8:40	DJN
Radium 226	See Attached Report			21 Feb 17	OL
Radium 228	See Attached Report			18 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll* <sup>2</sup> 8 Mar 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

Report Date: 7 Mar 17  
Lab Number: 17-W294  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 8 Feb 17 11:45  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW103  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.40	units	NA	SM 4500 H+ B	8 Feb 17 11:45	DJN
Temperature - Field	9.16	Degrees C	NA	SM 2550B	8 Feb 17 11:45	DJN
Conductivity - Field	1560	umhos/cm	1	EPA 120.1	8 Feb 17 11:45	DJN
Radium 226	See Attached Report				19 Feb 17	OL
Radium 228	See Attached Report				19 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K Carroll*

*cc*  
*8 Mar 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 1

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

Report Date: 7 Mar 17  
Lab Number: 17-W295  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 8 Feb 17 9:30  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW109  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.29 units	NA	SM 4500 H+ B	8 Feb 17 9:30	DJN
Temperature - Field	7.80 Degrees C	NA	SM 2550B	8 Feb 17 9:30	DJN
Conductivity - Field	1663 umhos/cm	1	EPA 120.1	8 Feb 17 9:30	DJN
Radium 226	See Attached Report			19 Feb 17	OL
Radium 228	See Attached Report			19 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K Carroll* *8 Mar 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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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: 7 Mar 17  
Lab Number: 17-W296  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 8 Feb 17  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: Dup 1  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			19 Feb 17	OL
Radium 228	See Attached Report			19 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K Carroll <sup>CC</sup> 8 Mar 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  
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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: 7 Mar 17  
Lab Number: 17-W297  
Work Order #: 82-0309  
Account #: 002800  
Date Sampled: 8 Feb 17  
Date Received: 9 Feb 17 8:00  
Sampled By: Client

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: Field Blank (FB)  
Sample Site: MDU Lewis & Clark  
Event and Year: February 2017

Temp at Receipt: 0.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			19 Feb 17	OL
Radium 228	See Attached Report			19 Feb 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K Carroll*

*8 Mar 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



Inter-Mountain Labs

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

Your Environmental Monitoring Partner

Date: 2/24/2017

CLIENT: MVTL Laboratories, Inc.  
Project: 201782-0309  
Lab Order: S1702125

**CASE NARRATIVE**  
Report ID: S1702125001

Samples 17-W287 MW110, 17-W288 MW119, 17-W289 MW210, 17-W290 MW102, 17-W291 MW118, 17-W292 MW111, 17-W293 MW117, 17-W294 MW103, 17-W295 MW109, 17-W296 Dup 1, and 17-W297 Field Blank were received on February 13, 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

Page 1 of 1



### Sample Analysis Report

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

Date Reported 2/24/2017  
Report ID S1702125001

ProjectName: 201782-0309  
Lab ID: S1702125-001  
ClientSample ID: 17-W287 MW110  
COC: 201782-0309

WorkOrder: S1702125  
CollectionDate: 2/6/2017 2:57:00 PM  
DateReceived: 2/13/2017 10:03:00 AM  
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	02/21/2017 1030	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1030	MB
Radium 228	2.1	pCi/L		1	Ga-Tech	02/18/2017 255	MB
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	02/18/2017 255	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** 2/24/2017  
**Report ID** S1702125001

**ProjectName:** 201782-0309  
**Lab ID:** S1702125-002  
**ClientSample ID:** 17-W288 MW119  
**COC:** 201782-0309

**WorkOrder:** S1702125  
**CollectionDate:** 2/6/2017 4:54:00 PM  
**DateReceived:** 2/13/2017 10:03:00 AM  
**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	02/21/2017 1030	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1030	MB
Radium 228	-5.5	pCi/L		1	Ga-Tech	02/18/2017 600	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	02/18/2017 600	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** 2/24/2017  
**Report ID** S1702125001

**ProjectName:** 201782-0309  
**Lab ID:** S1702125-003  
**ClientSample ID:** 17-W289 MW210  
**COC:** 201782-0309

**WorkOrder:** S1702125  
**CollectionDate:** 2/6/2017 6:40:00 PM  
**DateReceived:** 2/13/2017 10:03:00 AM  
**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	02/21/2017 1030	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1030	MB
Radium 228	-0.9	pCi/L		1	Ga-Tech	02/18/2017 904	MB
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	02/18/2017 904	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** 2/24/2017  
**Report ID** S1702125001

**ProjectName:** 201782-0309  
**Lab ID:** S1702125-004  
**ClientSample ID:** 17-W290 MW102  
**COC:** 201782-0309

**WorkOrder:** S1702125  
**CollectionDate:** 2/7/2017 12:45:00 PM  
**DateReceived:** 2/13/2017 10:03:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.9	pCi/L		0.2	SM 7500 Ra-B	02/21/2017 1657	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1657	MB
Radium 228	2.1	pCi/L		1	Ga-Tech	02/18/2017 1208	MB
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	02/18/2017 1208	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 2/24/2017  
Report ID S1702125001

ProjectName: 201782-0309  
Lab ID: S1702125-005  
ClientSample ID: 17-W291 MW118  
COC: 201782-0309

WorkOrder: S1702125  
CollectionDate: 2/7/2017 5:25:00 PM  
DateReceived: 2/13/2017 10:03:00 AM  
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	02/21/2017 1657	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	02/21/2017 1657	MB
Radium 228	1.1	pCi/L		1	Ga-Tech	02/18/2017 1512	MB
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	02/18/2017 1512	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 2/24/2017
Report ID S1702125001

ProjectName: 201782-0309
Lab ID: S1702125-006
ClientSample ID: 17-W292 MW111
COC: 201782-0309

WorkOrder: S1702125
CollectionDate: 2/7/2017 2:55:00 PM
DateReceived: 2/13/2017 10:03:00 AM
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 2/24/2017
Report ID S1702125001

ProjectName: 201782-0309
Lab ID: S1702125-007
ClientSample ID: 17-W293 MW117
COC: 201782-0309

WorkOrder: S1702125
CollectionDate: 2/7/2017 8:40:00 AM
DateReceived: 2/13/2017 10:03:00 AM
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** 2/24/2017  
**Report ID** S1702125001

**ProjectName:** 201782-0309  
**Lab ID:** S1702125-008  
**ClientSample ID:** 17-W294 MW103  
**COC:** 201782-0309

**WorkOrder:** S1702125  
**CollectionDate:** 2/8/2017 11:45:00 AM  
**DateReceived:** 2/13/2017 10:03:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.18	pCi/L		0.2	SM 7500 Ra-B	02/21/2017 1657	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1657	MB
Radium 228	-2.6	pCi/L		1	Ga-Tech	02/19/2017 027	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	02/19/2017 027	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** 2/24/2017  
**Report ID** S1702125001

**ProjectName:** 201782-0309  
**Lab ID:** S1702125-009  
**ClientSample ID:** 17-W295 MW109  
**COC:** 201782-0309

**WorkOrder:** S1702125  
**CollectionDate:** 2/8/2017 9:30:00 AM  
**DateReceived:** 2/13/2017 10:03:00 AM  
**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	02/21/2017 1657	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	02/21/2017 1657	MB
Radium 228	-1.5	pCi/L		1	Ga-Tech	02/19/2017 332	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	02/19/2017 332	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 2/24/2017
Report ID S1702125001

ProjectName: 201782-0309
Lab ID: S1702125-010
ClientSample ID: 17-W296 Dup 1
COC: 201782-0309

WorkOrder: S1702125
CollectionDate: 2/8/2017
DateReceived: 2/13/2017 10:03:00 AM
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 2/24/2017
Report ID S1702125001

ProjectName: 201782-0309
Lab ID: S1702125-011
ClientSample ID: 17-W297 Field Blank
COC: 201782-0309

WorkOrder: S1702125
CollectionDate: 2/8/2017
DateReceived: 2/13/2017 10:03:00 AM
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



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.  
Work Order: S1702125  
Project:

Date: 2/24/2017  
Report ID: S1702125001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-417 (02/17/17 11:32)	Analyte	RunNo:	143203	PrepDate:	02/14/17 0:00	BatchID	12848		
		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-417 (02/17/17 14:36)	Analyte	RunNo:	143203	PrepDate:	02/14/17 0:00	BatchID	12848		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		40	1	39.1	103	65.9 - 132			

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-417 (02/17/17 20:45)	Analyte	RunNo:	143203	PrepDate:	02/14/17 0:00	BatchID	12848		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		35	1	39.1	ND	88.5	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-417 (02/17/17 23:50)	Analyte	RunNo:	143203	PrepDate:	02/14/17 0:00	BatchID	12848		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		35	1	35	1.60	89.9	20		

Radium 226 in Water -		Sample Type	MBLK		Units: pCi/L				
MB-1719 (02/21/17 10:29)	Analyte	RunNo:	143285	PrepDate:	02/14/17 0:00	BatchID	12860		
		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-1719 (02/21/17 10:29)	Analyte	RunNo:	143285	PrepDate:	02/14/17 0:00	BatchID	12860		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.9	0.2	5.89	100	67.1 - 122			

Radium 226 in Water -		Sample Type	LCSD		Units: pCi/L				
LCSD-1719 (02/21/17 10:29)	Analyte	RunNo:	143285	PrepDate:	02/14/17 0:00	BatchID	12860		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		6.1	0.2	5.9	2.93	103	20		

Radium 226 in Water -		Sample Type	MS		Units: pCi/L				
S1702125-001AMS (02/21/17 10:30)	Analyte	RunNo:	143285	PrepDate:	02/14/17 0:00	BatchID	12860		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		6.0	0.2	5.89	ND	102	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

201782-0309

Company Name and Address:  <u>MVT L</u> 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #:
	Contact: Claudette	701-258-9720
Billing Address (indicate if different from above):  PO Box 249 New Ulm, MN 56073	Name of Sampler:	E-mail: <u>ccarroll@mvtl.com</u>
	Quote Number	For faxed report check box <input type="checkbox"/> For e-mail report check box <input type="checkbox"/>
	Project Name/Number:	Date Submitted: 9-Feb-17
		Purchase Order #: BL5782

Sample Information						Bottle Type					Analysis	
IML Lab Number	MVT L Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials	Impreserved	Glass Jar	Other	Analysis Required
51702125-001	17-W287	MW110	GW	6-Feb-17	1457		4					Ra226 & Ra228
<del>002</del>	17-W288	MW119	GW	6-Feb-17	1654		4					Ra226 & Ra228
<del>003</del>	17-W289	MW210	GW	6-Feb-17	1840		4					Ra226 & Ra228
<del>004</del>	17-W290	MW102	GW	7-Feb-17	1245		4					Ra226 & Ra228
<del>005</del>	17-W291	MW118	GW	7-Feb-17	1725		4					Ra226 & Ra228
<del>006</del>	17-W292	MW111	GW	7-Feb-17	1455		4					Ra226 & Ra228
<del>007</del>	17-W293	MW117	GW	7-Feb-17	840		4					Ra226 & Ra228
<del>008</del>	17-W294	MW103	GW	8-Feb-17	1145		4					Ra226 & Ra228
<del>009</del>	17-W295	MW109	GW	8-Feb-17	930		4					Ra226 & Ra228
<del>010</del>	17-W296	Dup 1	GW	8-Feb-17			4					Ra226 & Ra228
<del>011</del>	17-W297	Field Blank	GW	8-Feb-17			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	9-Feb-17	1700		<i>Sara Babcock</i>	2/13/17	10:03 2.4°C

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Niesmay

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

**Pre Site Calibration**

Date: 6 Feb 17 Time: 0712

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>19.15</u>	<u>6.92</u>	<u>7.00</u>	6.95-7.05	<u>-59.0</u>	0 +/- 50
Buffer 10	<u>19.20</u>	<u>10.01</u>	<u>10.00</u>	9.95-10.05	<u>-210.7</u>	-180 +/- 50

**Conductivity**

Buffer 1413	Temp °C	Pre Cal	Post Cal	Post Cal Range	Check
<u>18.83</u>	<u>14.08</u>	<u>1408</u>	<u>1413</u>	±10%	Buffer 5000 <u>5041</u>

**ORP**

231 mV @ 25C	Pre Cal	Post Cal	Post Cal Range
<u>8.44</u>	<u>235.6</u>	<u>231.1</u>	±10 mV

**DO**

Pre Cal	Post Cal	Barometric Pressure (mm Hg)
<u>11.08</u>	<u>10.97</u>	<u>704.3</u>

**Pre Site Calibration**

Date: 7 Feb 17 Time: 0735

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>20.17</u>	<u>6.97</u>	<u>7.00</u>	6.95-7.05	<u>-63.7</u>	0 +/- 50
Buffer 10	<u>19.70</u>	<u>9.99</u>	<u>10.00</u>	9.95-10.05	<u>-235.6</u>	-180 +/- 50

**Conductivity**

Buffer 1413	Temp °C	Pre Cal	Post Cal	Post Cal Range	Check
<u>20.09</u>	<u>14.29</u>	<u>1429</u>	<u>1414</u>	±10%	Buffer 5000 <u>4987</u>

**ORP**

231 mV @ 25C	Pre Cal	Post Cal	Post Cal Range
<u>19.84</u>	<u>224.8</u>	<u>231.0</u>	±10 mV

**DO**

Pre Cal	Post Cal	Barometric Pressure (mm Hg)
<u>21.55</u>	<u>6.87</u>	<u>727.3</u>

**Post Site Check**

Time: 0810

pH	Temp °C	Reading
Buffer 7	<u>7.04</u> <u>15.24</u>	<u>7.04</u>

**Conductivity**

Buffer 1413	Temp °C	Reading
<u>15.20</u>	<u>14.23</u>	<u>1423</u>

**Post Site Check**

Time: 0705

pH	Temp °C	Reading
Buffer 7	<u>9.58</u>	<u>6.97</u>

**Conductivity**

Buffer 1413	Temp °C	Reading
<u>9.58</u>	<u>1424</u>	<u>1424</u>

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Niebwaag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

**Pre Site Calibration**

Date: 8 Feb 17 Time: 0700

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>19.46</u>	<u>6.96</u>	<u>6.99</u>	6.95-7.05	<u>-53.1</u>	0 +/- 50
Buffer 10	<u>19.26</u>	<u>10.04</u>	<u>9.99</u>	9.95-10.05	<u>-22.8</u>	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 1413	<u>19.44</u>	<u>1396</u>	<u>1413</u>	±10%	Buffer 5000	<u>4985</u>
<b>ORP</b>						
231 mV @ 25C	<u>19.18</u>	<u>237.1</u>	<u>237.1</u>	±10 mV		
<b>DO</b>						
	<u>20.82</u>	<u>9.18</u>	<u>8.35</u>	Barometric Pressure (mm Hg)	<u>712.5</u>	
				mg/L		

**Post Site Check**

Time: 1230

pH	Temp °C	Reading
Buffer 7	<u>10.13</u>	<u>302</u>
<b>Conductivity</b>		
Buffer 1413	<u>9.20</u>	<u>1419</u>

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 1413				±10%	Buffer 5000	
<b>ORP</b>						
231 mV @ 25C				±10 mV		
<b>DO</b>						
				Barometric Pressure (mm Hg)		
				mg/L		

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

pH	Temp °C	Reading
Buffer 7		
<b>Conductivity</b>		
Buffer 1413		



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: Mw110  
Sampling Personal: *Darrin Nieswong*

Weather Conditions: Temp: 10 °F Wind: NE 13 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	9.42		ft
Total Well Depth:			ft
Well Volume:			liters
Depth to Top of Pump:	14.19		ft
Water Level After Sample:	9.71		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes	No	Recover:	153 sec.
Duplicate Sample?:	Yes	No	PSI:	
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	6 Feb 17	Time Purging Began:	7252	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	
Sample Date:	6 Feb 17	Time of Sampling:	1457	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1257	628	1146	7.40	6.21	130.6	179	9.71	500	Turbid
2	1317	6.69	1119	7.38	3.60	120.3	49.4	9.71	52000	sk clear
3	1337	6.69	1119	7.35	3.24	112.4	26.3	9.71	2000	clear
4	1357	6.69	1119	7.36	3.09	107.1	19.5	9.71	2000	clear
5	1417	6.70	1119	7.36	2.96	104.4	13.4	9.71	2000	clear
6	1437	6.78	1118	7.36	2.86	102.6	6.31	9.71	2000	clear
7	1442	6.85	1119	7.37	2.95	101.7	5.03	9.71	24500	clear
8	1447	6.86	1090	7.37	2.93	101.4	4.72	9.71	500	clear
9	1452	6.77	1118	7.37	2.90	100.7	4.68	9.71	500	clear
10	1457	6.69	1118	7.37	2.86	100.6	4.57	9.71	500	clear

Stabilized: Yes No  
Comments:

Total Volume Removed: 12500 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: MW19  
 Sampling Personal: Lauren Nieswag

Weather Conditions: Temp: 8 °F Wind: NE 13 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:	←		
Casing Diameter:	2"		
Water Level Before Purge:	9.42	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	1339	ft	
Water Level After Sample:	9.45	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes	No	Recover:	55 sec.
Duplicate Sample?:	Yes	No	PSI:	-
Duplicate Sample ID:	-		Pumping Rate:	0.0 mL/min
Purge Date:	6 Feb 17	Time Purging Began:	1549	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	- am/pm
Sample Date:	6 Feb 17	Time of Sampling:	1657	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1554	8.35	1190	7.27	5.26	118.7	57.7	9.47	500	Slightly turbid
2	1614	6.34	1201	7.33	2.23	81.0	13.4	9.49	500	clear
3	1634	6.25	1202	7.35	1.99	45.6	6.05	9.49	2000	clear
4	1644	6.37	1203	7.35	1.95	21.8	4.90	9.49	1000	clear
5	1649	6.38	1203	7.35	1.95	28.2	4.78	9.49	500	clear
6	1654	6.38	1204	7.36	1.94	24.2	4.57	9.49	500	clear
7										
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 6500 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 210  
Sampling Personal: Darren Nieswanger

Weather Conditions: Temp: 8 °F Wind: NE 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"/>	Not Visible
Repairs Necessary:	<input checked="" type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	9.66	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	28.33	ft
Water Level After Sample:		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>—</u>
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>6 Feb 17</u>	Time Purging Began: <u>1750</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>6 Feb 17</u>	Time of Sampling: <u>1840</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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									
1	1755	4.65	1450	7.75	7.28	103.8	20.2	10.62	500	clear
2	1810	6.00	1473	7.71	2.35	88.6	9.22	11.38	1500	clear
3	1820	6.41	1465	7.67	1.59	61.9	6.74	11.56	1000	clear
4	1825	6.44	1463	7.66	1.48	36.7	4.28	11.61	500	clear
5	1830	6.24	1462	7.65	1.39	6.0	4.42	11.63	500	clear
6	1835	6.45	1461	7.65	1.37	2.4	4.40	11.65	500	clear
7	1840	6.46	1465	7.65	1.30	2.4	4.12	11.64	500	clear
8										
9										
10										

Stabilized: Yes No  
Comments: (circled Yes)

Total Volume Removed: 5000 mL





# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: MW 102  
 Sampling Personal: Darren Niebuhr

Weather Conditions: Temp: 3 °F Wind: NW 5 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:	18.32		ft
Total Well Depth:			ft
Well Volume:			liters
Depth to Top of Pump:	20.68		ft
Water Level After Sample:	19.28		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="radio"/> No	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	-
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	7 Feb 17	Time Purging Began:	1020	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	
Sample Date:	7 Feb 17	Time of Sampling:	1245	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1025	7.43	6829	6.81	5.12	117.4	635	19.18	500	Turbid
2	1055	9.80	6825	6.81	2.58	48.0	120	19.22	2500	Turbid
3	1125	10.05	6810	6.81	2.63	37.7	19.7	19.22	3000	clear
4	1140	10.07	6855	6.81	2.40	32.8	23.4	19.28	1500	clear
5	1210	10.05	6882	6.81	2.63	33.5	19.8	19.28	3000	clear
6	1225	10.06	6903	6.81	2.28	31.4	7.97	19.28	1500	clear
7	1235	10.07	6913	6.81	2.47	31.3	4.90	19.28	1000	clear
8	1240	10.09	6912	6.81	2.48	31.2	4.71	19.28	500	clear
9	1245	10.06	6912	6.81	2.44	31.0	4.88	19.28	500	clear
10										

Stabilized:  Yes  No

Total Volume Removed: 14,500 mL

Comments:

Had pump in overnight and next morning pump wasn't working so changed it. That is why turbidity started so high.



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 118  
Sampling Personal: Darren Niesmaas

Weather Conditions: Temp: 0 °F Wind: NE Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	8.82		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	9.89		ft
Water Level After Sample:	8.90		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No	Recover: 56 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No	PSI: —
Duplicate Sample ID:	—	Pumping Rate: 100 mL/min
Purge Date:	7 Feb 17	Time Purging Began: 1610 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No	Time Purged Dry: — am/pm
Sample Date:	7 Feb 17	Time of Sampling: 1725 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter Nitric

### Field Measurements

Stabilization <sup>1</sup> (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	1615	5129	1652	6.10	85.9	7100	8.87	500	Turbid
2	1645	5145	1661	7.43	83.1	24.5	8.90	2000	clear
3	1700	5.35	1661	7.44	83.4	11.5	8.90	1500	clear
4	1700	5.30	1667	7.44	83.1	7.03	8.90	1000	clear
5	1715	5.35	1673	7.45	82.5	4.83	8.90	500	clear
6	1720	5.38	1667	7.45	82.2	4.24	8.90	500	clear
7	1725	5.34	1672	7.45	82.5	4.87	8.90	500	clear
8	1730								
9									
10									

Stabilized:  Yes  No

Total Volume Removed: 6500 mL

Comments: Had trouble with the pump at the beginning and changed it, check ball was sticking, that is why it is turbid at the beginning



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 111  
Sampling Personal: Darren Nieswag

Weather Conditions: Temp: 2 °F Wind: NS 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:	8.07		ft
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	13.38		ft
Water Level After Sample:	8.27		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	56 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	-
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	7 Feb 17	Time Purging Began:	1400	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	
Sample Date:	7 Feb 17	Time of Sampling:	6455	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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								
1	1405	7.04	3983	6.86	4.59	73.4	8.27	500	slightly turbid
2	1425	7.39	3282	7.08	2.67	81.0	8.27	2500	clear
3	1435	7.47	3206	7.11	2.98	82.5	8.27	1000	clear
4	1440	7.35	3190	7.12	3.11	83.2	8.27	500	clear
5	1445	7.56	3177	7.13	3.25	84.1	8.27	500	clear
6	1450	7.58	3178	7.13	3.27	84.3	8.27	500	clear
7	1455	7.62	3178	7.13	3.29	84.6	8.27	500	clear
8									
9									
10									

Stabilized: Yes  No   
Comments:

Total Volume Removed: 6000 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 117  
Sampling Personal: Darren Villway

Weather Conditions: Temp: -6 °F Wind: NW5 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	6.30	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	8.09	ft	
Water Level After Sample:	8.09 Top	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	4 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	56 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	-
Duplicate Sample ID:	<input type="checkbox"/>		Pumping Rate:	100 mL/min
Purge Date:	6 Feb 17	Time Purging Began:	1158	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	1238 am/pm
Sample Date:	7 Feb 17	Time of Sampling:	0840	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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

Stabilized: Yes  No

Total Volume Removed: 4000 mL

Comments:



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# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW103  
Sampling Personal: Darren Nielson

Weather Conditions: Temp: °F 0 Wind: W7 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:	-		
Casing Diameter:	2"		
Water Level Before Purge:	10.28	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	17.86	ft	
Water Level After Sample:	10.99	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	10-4 sec.
Dedicated Equip?:	Yes	No	Recover:	5-5 sec.
Duplicate Sample?:	Yes	No	PSI:	Orange Box
Duplicate Sample ID:	Dup-1		Pumping Rate:	600 mL/min
Purge Date:	8 Feb 17	Time Purging Began:	1040	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	-
Sample Date:	8 Feb 17	Time of Sampling:	1145	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1045	7.93	3546	7.26	4.71	102.2	92.5	10.98	500	slightly turbid
2	1105	8.21	1720	7.31	1.66	89.6	14.9	10.99	2000	clear
3	1120	8.52	1643	7.31	1.38	86.2	8.56	10.99	1500	clear
4	1125	8.48	1604	7.31	1.21	84.3	5.74	10.99	500	clear
5	1130	8.59	1595	7.31	1.17	84.4	4.24	10.99	500	clear
6	1135	9.09	1572	7.30	1.06	83.5	3.40	10.99	500	clear
7	1140	9.06	1564	7.30	1.02	83.4	3.62	10.99	500	clear
8	1145	9.16	1560	7.30	1.04	83.0	3.38	10.99	500	clear
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 6500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW109  
Sampling Personal: Darren Niesman

Weather Conditions: Temp: -9 °F Wind: SW 5 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:	2"		
Water Level Before Purge:	10.82		ft
Total Well Depth:	-		ft
Well Volume:	-		liters
Depth to Top of Pump:	13.92		ft
Water Level After Sample:	10.91		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>4</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: <u>-</u>
Duplicate Sample ID:	-	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>8 Feb 17</u>	Time Purging Began: <u>0840</u> am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/>	Time Purged Dry: <u>-</u> am/pm
Sample Date:	<u>8 Feb 17</u>	Time of Sampling: <u>0930</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	<u>0845</u>	<u>5.77</u>	<u>1712</u>	<u>7.18</u>	<u>4.38</u>	<u>126.4</u>	<u>17.8</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
2	<u>080910</u>	<u>7.02</u>	<u>1667</u>	<u>7.26</u>	<u>2.68</u>	<u>101.3</u>	<u>4.60</u>	<u>10.89</u>	<u>2500</u>	<u>cl</u>
3	<u>0915</u>	<u>7.51</u>	<u>1664</u>	<u>7.27</u>	<u>2.06</u>	<u>96.0</u>	<u>2.25</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
4	<u>0920</u>	<u>7.74</u>	<u>1668</u>	<u>7.29</u>	<u>1.61</u>	<u>90.8</u>	<u>1.26</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
5	<u>0925</u>	<u>7.72</u>	<u>1665</u>	<u>7.29</u>	<u>1.60</u>	<u>90.6</u>	<u>1.31</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
6	<u>0930</u>	<u>7.80</u>	<u>1663</u>	<u>7.29</u>	<u>1.58</u>	<u>90.1</u>	<u>1.32</u>	<u>10.91</u>	<u>500</u>	<u>cl</u>
7										
8										
9										
10										

Stabilized: Yes  No   
Comments:

Total Volume Removed: 5000 mL



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Niles Waag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	6 Feb 17	1134	9.50	
MW105	6 Feb 17	1146	9.13	
MW106	6 Feb 17	1149	9.74	
MW107	6 Feb 17	1132	4.53	
MW108	6 Feb 17	1142	17.06	
MW116	6 Feb 17	1137	11.29	



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	8 Feb 17	1051	Dry	-
West Scrubber Pond Gauge	8 Feb 17	1052	5.58	
Stream behind Sewage Lagoon	8 Feb 17	0818	0.35	







CASE NARRATIVE

-MVTl Lab Reference No/SDG: 201782-0803
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: State Groundwater - April 2017 Event
MVTl Laboratory Identifications: 17-W800 through 17-W810
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTl Laboratory #. Rows include MW110, MW119, MW210, MW102, MW118, MW111, MW117, MW103, MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 5 Apr 2017 at 1615.
Samples were collected and hand delivered by MVTl Field Service personnel to the laboratory.
Samples were received on ice and evidence of cooling had begun.
Temperature of samples upon receipt was 2.0°C.
All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

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

III. METHODS

- Approved methodology was followed for all sample analyses.
Methods 6010D and Method 6020B were used to analyze the metals.



CASE NARRATIVE

-MVTl Lab Reference No/SDG: 201782-0803  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: State Groundwater – April 2017 Event  
MVTl Laboratory Identifications: 17-W800 through 17-W810  
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 metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
  - The recoveries for one alkalinity matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTl Laboratories.

SIGNED: Claudette Carroll DATE: 18 Apr 17  
Claudette Carroll - MVTl Bismarck Laboratory Manager



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark State

Work Order: 201782-0803

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Dissolved mg/l	0.0160	101	80-120	0.100	17W805q	< 0.001	0.1054	105	75-125	0.1054	0.1033	103	2.0	20	-	-	< 0.001
	0.0160	100	80-120	0.100	17W809q	< 0.001	0.1012	101	75-125	0.1012	0.1040	104	2.7	20	-	-	< 0.001
Arsenic - Dissolved mg/l	0.0160	100	80-120	0.100	17W805q	< 0.002	0.1082	108	75-125	0.1082	0.1056	106	2.4	20	-	-	< 0.002
	0.0160	94	80-120	0.100	17W809q	0.0023	0.0982	96	75-125	0.0982	0.1052	103	6.9	20	-	-	< 0.002
Barium - Dissolved mg/l	0.0160	100	80-120	0.100	17W805q	0.0177	0.1149	97	75-125	0.1149	0.1123	95	2.3	20	-	-	< 0.002
	0.0160	99	80-120	0.100	17W809q	0.0203	0.1159	96	75-125	0.1159	0.1205	100	3.9	20	-	-	< 0.002
Beryllium - Dissolved mg/l	0.0160	102	80-120	0.100	17W805q	< 0.0005	0.1120	112	75-125	0.1120	0.1062	106	5.3	20	-	-	< 0.0005
	0.0160	97	80-120	0.100	17W809q	< 0.0005	0.0975	97	75-125	0.0975	0.1015	102	4.0	20	-	-	< 0.0005
Boron - Dissolved mg/l	0.40	108	80-120	3.00	17-W805	7.13	10.4	109	75-125	10.4	10.5	112	1.0	20	-	-	< 0.1
	0.40	110	80-120	1.50	17-W806	8.16	9.76	107	75-125	9.76	9.92	117	1.6	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1



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## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark State

Work Order: 201782-0803

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
Cadmium - Dissolved mg/l	0.0160	101	80-120	0.100	17W805q	< 0.0005	0.1020	102	75-125	0.1020	0.1004	100	1.6	20	-	-	< 0.0005
	0.0160	99	80-120	0.100	17W809q	< 0.0005	0.0994	99	75-125	0.0994	0.0995	100	0.1	20	-	-	< 0.0005
Calcium - Dissolved mg/l	20.0	106	80-120	100	17-W800	83.8	170	86	75-125	170	170	86	0.0	20	-	-	< 1
				100	17-W808	95.6	180	84	75-125	180	177	81	1.7	20	-	-	< 1
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100	17W805q	< 0.002	0.1030	103	75-125	0.1030	0.0998	100	3.2	20	-	-	< 0.002
	0.0160	97	80-120	0.100	17W809q	< 0.002	0.0933	93	75-125	0.0933	0.0971	97	4.0	20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.0160	101	80-120	0.100	17W805q	< 0.002	0.1010	101	75-125	0.1010	0.0977	98	3.3	20	-	-	< 0.002
	0.0160	97	80-120	0.100	17W809q	< 0.002	0.0914	91	75-125	0.0914	0.0947	95	3.5	20	-	-	< 0.002



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## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark State

Work Order: 201782-0803

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		
Lead - Dissolved mg/l	0.0160	102	80-120	0.100	17W805q	< 0.0005	0.0973	97	75-125	0.0973	0.0940	94	3.5	20	-	-	< 0.0005		
	0.0160	102	80-120	0.100	17W809q	< 0.0005	0.0946	95	75-125	0.0946	0.0994	99	4.9	20	-	-	< 0.0005		
Lithium - Dissolved mg/l	0.40	112	80-120	0.200	17-W809	0.08	0.28	100	75-125	0.28	0.28	100	0.0	20	-	-	< 0.1		
				0.200	17-W810	< 0.1	0.20	100	75-125	0.20	0.21	105	4.9	20	-	-	< 0.1		
																			< 0.1
Magnesium - Dissolved mg/l	20.0	108	80-120	100	17-D1019	14.1	109	95	75-125	109	108	94	0.9	20	-	-	< 1		
				100	17-W800	52.9	144	91	75-125	144	144	91	0.0	20	-	-	< 1		
				100	17-W808	140	223	83	75-125	223	221	81	0.9	20	-	-			
Magnesium - Total mg/l	20.0	110	80-120	100	17W796q	60.1	154	94	75-125	154	155	95	0.6	20	-	-	< 1		
				100	17W802q	24.7	120	95	75-125	120	119	94	0.8	20	-	-	< 1		
																			< 1
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	17-W809	< 0.0002	0.0019	95	70-130	0.0019	0.0019	95	0.0	20	-	-	< 0.0002		
				0.002	17-W810	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-			

**Quality Control Report**

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark State

Work Order: 201782-0803

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
Molybdenum - Dissolved mg/l	0.0160	106	80-120	0.100	17W805q	0.0718	0.1794	108	75-125	0.1794	0.1806	109	0.7	20	-	-	< 0.002
	0.0160	100	80-120	0.100	17W809q	0.0524	0.1503	98	75-125	0.1503	0.1546	102	2.8	20	-	-	< 0.002
Potassium - Dissolved mg/l	10.0	95	80-120	20.0	17-W800	5.8	23.6	89	75-125	23.6	23.6	89	0.0	20	-	-	< 1
				20.0	17-W808	7.4	24.8	87	75-125	24.8	24.7	86	0.4	20	-	-	< 1
Potassium - Total mg/l	10.0	98	80-120	20.0	17W796q	3.9	22.0	90	75-125	22.0	22.1	91	0.5	20	-	-	< 1
	10.0	96	80-120	20.0	17W802q	7.8	25.7	90	75-125	25.7	25.6	89	0.4	20	-	-	< 1
Selenium - Dissolved mg/l	0.0160	108	80-120	0.100	17W805q	0.0912	0.2042	113	75-125	0.2042	0.2008	110	1.7	20	-	-	< 0.002
	0.0160	95	80-120	0.100	17W809q	0.0748	0.1750	100	75-125	0.1750	0.1833	108	4.6	20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0	103	80-120	100	17-W800	78.8	169	90	75-125	169	169	90	0.0	20	-	-	< 1
				100	17-W808	74.4	164	90	75-125	164	161	86	1.8	20	-	-	< 1



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## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark State

Work Order: 201782-0803

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
Sodium - Total mg/l	20.0	105	80-120	100	17W796q	43.6	138	94	75-125	138	139	95	0.7	20	-	-	< 1
	20.0	103	80-120	200	17W802q	262	473	106	75-125	473	475	106	0.4	20	-	-	< 1
Thallium - Dissolved mg/l	0.0160	101	80-120	0.100	17W805q	< 0.0005	0.0986	99	75-125	0.0986	0.0950	95	3.7	20	-	-	< 0.0005
	0.0160	101	80-120	0.100	17W809q	< 0.0005	0.0953	95	75-125	0.0953	0.0998	100	4.6	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	94	90-110	410	17-W799	456	742	70	80-120	742	740	69	0.3	20	94	80-120	< 20
	410	96	90-110	410	17-W806	391	754	89	80-120	754	758	90	0.5	20			< 20
	410	94	90-110	410	17-D1050	693	1047	86	80-120	1047	1041	85	0.6	20			< 20
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	146	133	-	9.3	20	-	-	< 2
	-	-	-	-	-	-	-	-	-	12	10	-	18.2	20	-	-	< 2
	-	-	-	-	-	-	-	-	-	20	18	-	10.5	20	-	-	

Approved by: C. Grant  
18 Apr 17





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### CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17  
Lab Number: 17-W800  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 3 Apr 17 16:53  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW110

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	6	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.43	units	NA	SM 4500 H+ B	3 Apr 17 16:53	DJN
Temperature - Field	6.95	Degrees C	NA	SM 2550B	3 Apr 17 16:53	DJN
Total Alkalinity	332	mg/l CaCO3	20	SM2320-B	5 Apr 17 18:00	SVS
Conductivity - Field	1103	umhos/cm	1	EPA 120.1	3 Apr 17 16:53	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	54.3	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Sodium - Total	80.1	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Potassium - Total	5.9	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Calcium - Dissolved	83.8	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	52.9	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	78.8	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	5.8	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	0.22	mg/l	0.10	6010	12 Apr 17 14:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 9:32	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Barium - Dissolved	0.0279	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Molybdenum - Dissolved	0.0035	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Selenium - Dissolved	0.0032	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* *17 Apr 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 - STATE

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

Report Date: 14 Apr 17  
 Lab Number: 17-W801  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 3 Apr 17 18:40  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW119

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	3	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.46	units	NA	SM 4500 H+ B	3 Apr 17 18:40	DJN
Temperature - Field	6.89	Degrees C	NA	SM 2550B	3 Apr 17 18:40	DJN
Total Alkalinity	372	mg/l CaCO3	20	SM2320-B	5 Apr 17 18:00	SVS
Conductivity - Field	1197	umhos/cm	1	EPA 120.1	3 Apr 17 18:40	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	59.3	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Sodium - Total	86.6	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Potassium - Total	6.7	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Calcium - Dissolved	92.3	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	59.7	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	86.9	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	7.0	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	0.23	mg/l	0.10	6010	12 Apr 17 14:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 9:32	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Barium - Dissolved	0.0305	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Cadmium - Dissolved	0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Molybdenum - Dissolved	0.0038	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Selenium - Dissolved	0.0032	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD

\* Holding time exceeded

Approved by:

*Claudette K Carroll* 17 Apr 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 - STATE

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

Report Date: 14 Apr 17  
 Lab Number: 17-W802  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 10:55  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW210

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	6	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.65	units	NA	SM 4500 H+ B	4 Apr 17 10:55	DJN
Temperature - Field	8.62	Degrees C	NA	SM 2550B	4 Apr 17 10:55	DJN
Total Alkalinity	384	mg/l CaCO3	20	SM2320-B	5 Apr 17 18:00	SVS
Conductivity - Field	1429	umhos/cm	1	EPA 120.1	4 Apr 17 10:55	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	24.7	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	262	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	7.8	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	41.8	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	23.6	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	252	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	7.6	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	0.20	mg/l	0.10	6010	12 Apr 17 14:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 9:32	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Barium - Dissolved	0.0240	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Molybdenum - Dissolved	0.0042	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Selenium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*rc*  
*17 Apr 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 sample quantity

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

CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17  
 Lab Number: 17-W803  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 13:20  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW102

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	12	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.01	units	NA	SM 4500 H+ B	4 Apr 17 13:20	DJN
Temperature - Field	8.71	Degrees C	NA	SM 2550B	4 Apr 17 13:20	DJN
Total Alkalinity	373	mg/l CaCO3	20	SM2320-B	5 Apr 17 18:00	SVS
Conductivity - Field	6812	umhos/cm	1	EPA 120.1	4 Apr 17 13:20	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	1140	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	206	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	23.4	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	298	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	1120	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	204	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	22.9	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	0.25	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	25.5	mg/l	0.10	6010	12 Apr 17 14:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 9:32	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Barium - Dissolved	0.0177	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Cobalt - Dissolved	0.0073	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Molybdenum - Dissolved	0.1239	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Selenium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>KC</sup> 17 Apr 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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www.mvttl.com



CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17
Lab Number: 17-W804
Work Order #: 82-0803
Account #: 002800
Date Sampled: 4 Apr 17 17:25
Date Received: 5 Apr 17 16:15
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW118

Temp at Receipt: 2.0C

Event and Year: April 2017

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Lists various chemical tests such as Total Suspended Solids, pH, Temperature, etc.

\* Holding time exceeded

Approved by: Claudette K. Carroll (signature) 17 Apr 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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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17  
 Lab Number: 17-W805  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 15:18  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW111

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	2	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.37	units	NA	SM 4500 H+ B	4 Apr 17 15:18	DJN
Temperature - Field	6.64	Degrees C	NA	SM 2550B	4 Apr 17 15:18	DJN
Total Alkalinity	372	mg/l CaCO3	20	SM2320-B	5 Apr 17 18:00	SVS
Conductivity - Field	3169	umhos/cm	1	EPA 120.1	4 Apr 17 15:18	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	410	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	112	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	8.3	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	138	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	404	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	109	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	8.2	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	0.15	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	7.13	mg/l	0.10	6010	12 Apr 17 14:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 9:32	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Barium - Dissolved	0.0177	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD
Molybdenum - Dissolved	0.0718	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Selenium - Dissolved	0.0912	mg/l	0.0020	6020	10 Apr 17 9:32	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 9:32	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*17 Apr 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 sample quantity

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

CERTIFICATION: ND # ND-00016



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17
Lab Number: 17-W806
Work Order #: 82-0803
Account #: 002800
Date Sampled: 4 Apr 17 8:10
Date Received: 5 Apr 17 16:15
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW117

Temp at Receipt: 2.0C

Event and Year: April 2017

Table with 7 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Total Suspended Solids, pH - Field, Temperature - Field, Total Alkalinity, Conductivity - Field, Mercury - Dissolved, Magnesium - Total, Sodium - Total, Potassium - Total, Calcium - Dissolved, Magnesium - Dissolved, Sodium - Dissolved, Potassium - Dissolved, Lithium - Dissolved, Boron - Dissolved, Antimony - Dissolved, Arsenic - Dissolved, Barium - Dissolved, Beryllium - Dissolved, Cadmium - Dissolved, Chromium - Dissolved, Cobalt - Dissolved, Lead - Dissolved, Molybdenum - Dissolved, Selenium - Dissolved, Thallium - Dissolved.

\* Holding time exceeded

Approved by: Claudette K. Carroll 17 Apr 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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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 14 Apr 17  
 Lab Number: 17-W807  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 5 Apr 17 11:03  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW103

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	4	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.94	units	NA	SM 4500 H+ B	5 Apr 17 11:03	DJN
Temperature - Field	8.58	Degrees C	NA	SM 2550B	5 Apr 17 11:03	DJN
Total Alkalinity	322	mg/l CaCO3	20	SM2320-B	5 Apr 17 17:00	SVS
Conductivity - Field	1519	umhos/cm	1	EPA 120.1	5 Apr 17 11:03	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	124	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	77.7	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	6.9	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	83.0	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Magnesium - Dissolved	123	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Sodium - Dissolved	76.6	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Potassium - Dissolved	6.9	mg/l	1.0	6010	11 Apr 17 15:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	1.57	mg/l	0.10	6010	12 Apr 17 15:29	KMD
Antimony - Dissolved	0.0043	mg/l	0.0010	6020	10 Apr 17 12:07	KMD
Arsenic - Dissolved	0.0029	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Barium - Dissolved	0.0212	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Molybdenum - Dissolved	0.0218	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Selenium - Dissolved	0.0570	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*17 Apr 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 - STATE

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

Report Date: 14 Apr 17  
Lab Number: 17-W808  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 5 Apr 17 8:40  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: MW109

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	3	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
pH - Field	7.55	units	NA	SM 4500 H+ B	5 Apr 17 8:40	DJN
Temperature - Field	6.14	Degrees C	NA	SM 2550B	5 Apr 17 8:40	DJN
Total Alkalinity	304	mg/l CaCO3	20	SM2320-B	5 Apr 17 17:00	SVS
Conductivity - Field	1668	umhos/cm	1	EPA 120.1	5 Apr 17 8:40	DJN
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	138	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	74.0	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	7.2	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	95.6	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Magnesium - Dissolved	140	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Sodium - Dissolved	74.4	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Potassium - Dissolved	7.4	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	2.06	mg/l	0.10	6010	12 Apr 17 15:29	KMD
Antimony - Dissolved	0.0045	mg/l	0.0010	6020	10 Apr 17 12:07	KMD
Arsenic - Dissolved	0.0027	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Barium - Dissolved	0.0211	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Molybdenum - Dissolved	0.0239	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Selenium - Dissolved	0.0664	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*17 April*

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 - STATE

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

Report Date: 14 Apr 17  
Lab Number: 17-W809  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 5 Apr 17  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273

Sample Description: Dup 1

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	< 2	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
Total Alkalinity	310	mg/l CaCO3	20	SM2320-B	5 Apr 17 17:00	SVS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	155	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	79.7	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	6.2	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	72.4	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Magnesium - Dissolved	151	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Sodium - Dissolved	78.6	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Potassium - Dissolved	6.2	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	1.65	mg/l	0.10	6010	12 Apr 17 15:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 12:07	KMD
Arsenic - Dissolved	0.0023	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Barium - Dissolved	0.0203	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Molybdenum - Dissolved	0.0524	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Selenium - Dissolved	0.0748	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD

\* Holding time exceeded

Approved by: Claudette K Carroll *17 Apr 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 - STATE

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

Report Date: 14 Apr 17  
Lab Number: 17-W810  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 5 Apr 17  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: Field Blank (FB)

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Suspended Solids	< 2	mg/l	2	I3765-85	6 Apr 17 14:56	SVS
Total Alkalinity	< 20	mg/l CaCO3	20	SM2320-B	5 Apr 17 17:00	SVS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Apr 17 12:02	EV
Magnesium - Total	< 1	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Sodium - Total	< 1	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Potassium - Total	< 1	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Calcium - Dissolved	< 1	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Magnesium - Dissolved	< 1	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Sodium - Dissolved	< 1	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Potassium - Dissolved	< 1	mg/l	1.0	6010	11 Apr 17 16:23	SZ
Lithium - Dissolved	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Dissolved	< 0.1	mg/l	0.10	6010	12 Apr 17 15:29	KMD
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	10 Apr 17 12:07	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Barium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	10 Apr 17 12:07	KMD
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	10 Apr 17 12:07	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*17 Apr 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



CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201782-0803
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater – April 2017 Event
MVTL Laboratory Identifications: 17-W800 through 17-W810
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include MW110, MW119, MW210, MW102, MW118, MW111, MW117, MW103, MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 5 Apr 2017 at 1615.
Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
Samples were received on ice and evidence of cooling had begun.
Temperature of samples upon receipt was 2.0°C.
All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

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

III. METHODS

- Approved methodology was followed for all sample analyses.
Methods 6010D and Method 6020B were used to analyze the metals.



CASE NARRATIVE

-MVTL Lab Reference No/SDG: 201782-0803  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: CCR Groundwater – April 2017 Event  
MVTL Laboratory Identifications: 17-W800 through 17-W810  
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 metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 18 Apr 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



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MEMBER  
ACIL

## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark CCR

Work Order: 201782-0803

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	103	80-120	0.400	17W775q	< 0.001	0.3938	98	75-125	0.3938	0.4062	102	3.1	20	-	-	< 0.001
				0.400	17W791q	< 0.001	0.4078	102	75-125	0.4078	0.4226	106	3.6	20	-	-	
				0.400	17W801q	< 0.001	0.3954	99	75-125	0.3954	0.4168	104	5.3	20	-	-	
Arsenic - Total mg/l	0.1000	106	80-120	0.400	17W775q	< 0.002	0.4124	103	75-125	0.4124	0.4222	106	2.3	20	-	-	< 0.002
				0.400	17W791q	< 0.002	0.4266	107	75-125	0.4266	0.4326	108	1.4	20	-	-	
				0.400	17W801q	< 0.002	0.4158	104	75-125	0.4158	0.4292	107	3.2	20	-	-	
Barium - Total mg/l	0.1000	103	80-120	0.400	17W775q	< 0.002	0.3762	94	75-125	0.3762	0.3824	96	1.6	20	-	-	< 0.002
				0.400	17W791q	0.0440	0.4290	96	75-125	0.4290	0.4384	99	2.2	20	-	-	
				0.400	17W801q	0.0290	0.4074	95	75-125	0.4074	0.4252	99	4.3	20	-	-	
Beryllium - Total mg/l	0.1000	108	80-120	0.400	17W775q	< 0.0005	0.4118	103	75-125	0.4118	0.4052	101	1.6	20	-	-	< 0.0005
				0.400	17W791q	< 0.0005	0.4294	107	75-125	0.4294	0.4398	110	2.4	20	-	-	
				0.400	17W801q	< 0.0005	0.4258	106	75-125	0.4258	0.4460	112	4.6	20	-	-	
Boron - Total mg/l	0.40	108	80-120	0.400	17-W791	0.40	0.81	102	75-125	0.81	0.80	100	1.2	20	-	-	< 0.1
				0.400	17-W801	0.22	0.63	102	75-125	0.63	0.64	105	1.6	20	-	-	< 0.1
Cadmium - Total mg/l	0.1000	104	80-120	0.400	17W775q	< 0.0005	0.3984	100	75-125	0.3984	0.4040	101	1.4	20	-	-	< 0.0005
				0.400	17W791q	< 0.0005	0.4090	102	75-125	0.4090	0.4226	106	3.3	20	-	-	
				0.400	17W801q	0.0006	0.3892	97	75-125	0.3892	0.4090	102	5.0	20	-	-	
Calcium - Total mg/l	20.0	108	80-120	100	17W796q	94.5	184	90	75-125	184	185	90	0.5	20	-	-	< 1
	20.0	105	80-120	100	17W802q	44.2	136	92	75-125	136	133	89	2.2	20	-	-	< 1
Chloride mg/l	30.0	80	80-120	30.0	17-W791	8.1	34.3	87	80-120	34.3	36.7	95	6.8	20	-	-	< 1
	30.0	80	80-120	1200	17-W876	2840	3980	95	80-120	3980	4230	116	6.1	20	-	-	< 1
	30.0	80	80-120												-	-	< 1
	30.0	81	80-120												-	-	< 1



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MEMBER  
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## Quality Control Report

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark CCR

Work Order: 201782-0803

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<=)	Known Rec (%)	Known % Rec Limits	Method Blank
Chromium - Total mg/l	0.1000	99	80-120	0.400	17W775q	< 0.002	0.3762	94	75-125	0.3762	0.3810	95	1.3	20	-	-	< 0.002
				0.400	17W791q	< 0.002	0.3808	95	75-125	0.3808	0.3884	97	2.0	20	-	-	
				0.400	17W801q	< 0.002	0.3676	92	75-125	0.3676	0.3852	96	4.7	20	-	-	
Cobalt - Total mg/l	0.1000	99	80-120	0.400	17W775q	< 0.002	0.3766	94	75-125	0.3766	0.3802	95	1.0	20	-	-	< 0.002
				0.400	17W791q	< 0.002	0.3778	94	75-125	0.3778	0.3900	98	3.2	20	-	-	
				0.400	17W801q	< 0.002	0.3718	93	75-125	0.3718	0.3800	95	2.2	20	-	-	
Fluoride mg/l	0.50	102	90-110	0.500	17-W791	0.16	0.68	104	80-120	0.68	0.68	104	0.0	20	-	-	< 0.1
	0.50	100	90-110	0.500	17-W818	0.41	0.93	104	80-120	0.93	0.93	104	0.0	20	-	-	< 0.1
	0.50	102	90-110	0.500	17-W855Q	4.29	4.73	88	80-120	4.73	4.74	90	0.2	20	-	-	< 0.1
	0.50	100	90-110												-	-	< 0.1
Lead - Total mg/l	0.1000	105	80-120	0.400	17W775q	< 0.0005	0.4050	101	75-125	0.4050	0.4016	100	0.8	20	-	-	< 0.0005
				0.400	17W791q	< 0.0005	0.3992	100	75-125	0.3992	0.4070	102	1.9	20	-	-	
				0.400	17W801q	< 0.0005	0.3938	98	75-125	0.3938	0.4178	104	5.9	20	-	-	
Lithium - Total mg/l	0.40	112	80-120	0.400	17-W775	< 0.1	0.45	112	75-125	0.45	0.45	112	0.0	20	-	-	< 0.1
	0.40	115	80-120	0.400	17-W791	0.10	0.56	115	75-125	0.56	0.55	112	1.8	20	-	-	< 0.1
				0.400	17-W801	< 0.1	0.47	118	75-125	0.47	0.48	120	2.1	20	-	-	< 0.1
Mercury - Total mg/l	0.0020	100	85-115	0.100	17-M541	< 0.01	0.1048	105	70-130	0.1048	0.1038	104	1.0	20	-	-	< 0.0002
	0.0020	100	85-115	0.002	17-W791	< 0.0002	0.0019	95	70-130	0.0019	0.0020	100	5.1	20	-	-	< 0.0002
				0.002	17-W810	< 0.0002	0.0020	100	70-130	0.0020	0.0020	100	0.0	20	-	-	
				0.002	A12188	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	
Molybdenum - Total mg/l	0.1000	102	80-120	0.400	17W775q	< 0.002	0.3900	98	75-125	0.3900	0.4026	101	3.2	20	-	-	< 0.002
				0.400	17W791q	< 0.002	0.4174	104	75-125	0.4174	0.4304	108	3.1	20	-	-	
				0.400	17W801q	0.0035	0.4068	101	75-125	0.4068	0.4334	107	6.3	20	-	-	

**Quality Control Report**

Lab IDs: 17-W800 to 17-W810

Project: MDU Lewis & Clark CCR

Work Order: 201782-0803

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
pH units	-	-	-	-	-	-	-	-	-	7.3	7.4	-	1.4	20	-	-	-
	-	-	-	-	-	-	-	-	-	9.6	7.9	-	19.4	20	-	-	-
	-	-	-	-	-	-	-	-	-	6.9	6.8	-	1.5	20	-	-	-
Selenium - Total mg/l	0.1000	111	80-120	0.400	17W775q	< 0.002	0.4650	116	75-125	0.4650	0.4420	110	5.1	20	-	-	< 0.002
				0.400	17W791q	< 0.002	0.4572	114	75-125	0.4572	0.4448	111	2.7	20	-	-	
				0.400	17W801q	0.0032	0.4510	112	75-125	0.4510	0.4656	116	3.2	20	-	-	
Sulfate mg/l	100	103	80-120	200	17-W796	106	298	96	80-120	298	304	99	2.0	20	-	-	< 5
	100	100	80-120	100	17-W810	< 5	93.9	94	80-120	93.9	92.0	92	2.0	20	-	-	< 5
				500	17-W769	803	1230	85	80-120	1230	1210	81	1.6	20	-	-	
Thallium - Total mg/l	0.1000	109	80-120	0.400	17W775q	< 0.0005	0.4210	105	75-125	0.4210	0.4170	104	1.0	20	-	-	< 0.0005
				0.400	17W791q	< 0.0005	0.4172	104	75-125	0.4172	0.4238	106	1.6	20	-	-	
				0.400	17W801q	< 0.0005	0.4070	102	75-125	0.4070	0.4330	108	6.2	20	-	-	
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	2010	2010	-	0.0	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	1100	1180	-	7.0	20	-	-	< 10

Approved by: C. Cantel  
 17 Apr 17





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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 14 Apr 17  
 Lab Number: 17-W800  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 3 Apr 17 16:53  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

PO #: 165273

Sample Description: MW110

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.43	units	NA	SM 4500 H+ B	3 Apr 17 16:53	DJN
pH	* 7.4	units	0.1	SM4500 H+ B	5 Apr 17 18:00	SVS
Temperature - Field	6.95	Degrees C	NA	SM 2550B	3 Apr 17 16:53	DJN
Conductivity - Field	1103	umhos/cm	1	EPA 120.1	3 Apr 17 16:53	DJN
Fluoride	0.44	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	166	mg/l	5.00	ASTM D516-07	7 Apr 17 10:41	EMS
Chloride	21.6	mg/l	1.0	SM4500-Cl-E	13 Apr 17 11:35	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 12:09	EV
Total Dissolved Solids	653	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	86.1	mg/l	1.0	6010	11 Apr 17 13:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 14:30	KMD
Boron - Total	0.21	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0287	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0033	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*cc*  
*17 Apr 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:

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! = Due to sample quantity

# = Due to concentration of other analytes  
+ = 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: 14 Apr 17  
 Lab Number: 17-W801  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 3 Apr 17 18:40  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

PO #: 165273

Sample Description: MW119

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result	Method	Method Reference	Date Analyzed	Analyst
pH - Field	7.46	units	NA	SM 4500 H+ B	3 Apr 17 18:40 DJN
pH	* 7.5	units	0.1	SM4500 H+ B	5 Apr 17 18:00 SVS
Temperature - Field	6.89	Degrees C	NA	SM 2550B	3 Apr 17 18:40 DJN
Conductivity - Field	1197	umhos/cm	1	EPA 120.1	3 Apr 17 18:40 DJN
Fluoride	0.42	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00 SVS
Sulfate	171	mg/l	5.00	ASTM D516-07	7 Apr 17 10:41 EMS
Chloride	25.6	mg/l	1.0	SM4500-Cl-E	13 Apr 17 11:35 EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 12:09 EV
Total Dissolved Solids	698	mg/l	10	I1750-85	7 Apr 17 14:26 SVS
Calcium - Total	92.5	mg/l	1.0	6010	11 Apr 17 13:01 SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30 KMD
Boron - Total	0.22	mg/l	0.10	6010	12 Apr 17 16:29 KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00 KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Barium - Total	0.0290	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00 KMD
Cadmium - Total	0.0006	mg/l	0.0005	6020	11 Apr 17 11:00 KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00 KMD
Molybdenum - Total	0.0035	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	11 Apr 17 11:00 KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00 KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*cc*  
*17 Apr 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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The reporting limit was elevated for any analyte requiring a dilution as coded below:  
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 ! = 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: 14 Apr 17  
 Lab Number: 17-W802  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 10:55  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW210

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.65	units	NA	SM 4500 H+ B	4 Apr 17 10:55	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	5 Apr 17 18:00	SVS
Temperature - Field	8.62	Degrees C	NA	SM 2550B	4 Apr 17 10:55	DJN
Conductivity - Field	1429	umhos/cm	1	EPA 120.1	4 Apr 17 10:55	DJN
Fluoride	0.98	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	334	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	4.0	mg/l	1.0	SM4500-Cl-E	13 Apr 17 11:35	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	876	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	44.2	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	0.21	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0238	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0041	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* *17 Apr 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: 14 Apr 17
Lab Number: 17-W803
Work Order #:82-0803
Account #: 002800
Date Sampled: 4 Apr 17 13:20
Date Received: 5 Apr 17 16:15
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW102

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include pH - Field, Temperature - Field, Conductivity - Field, Fluoride, Sulfate, Chloride, Mercury - Total, Total Dissolved Solids, Calcium - Total, Lithium - Total, Boron - Total, Antimony - Total, Arsenic - Total, Barium - Total, Beryllium - Total, Cadmium - Total, Chromium - Total, Cobalt - Total, Lead - Total, Molybdenum - Total, Selenium - Total, Thallium - Total.

\* Holding time exceeded

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

Approved by:

Claudette K. Carroll

CC
17 Apr 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:

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: = 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: 14 Apr 17  
 Lab Number: 17-W804  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 17:25  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW118

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.64	units	NA	SM 4500 H+ B	4 Apr 17 17:25	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	5 Apr 17 18:00	SVS
Temperature - Field	6.13	Degrees C	NA	SM 2550B	4 Apr 17 17:25	DJN
Conductivity - Field	1618	umhos/cm	1	EPA 120.1	4 Apr 17 17:25	DJN
Fluoride	1.28	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	534	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	18.9	mg/l	1.0	SM4500-Cl-E	13 Apr 17 11:35	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	1120	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	75.0	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	1.60	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	0.0022	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0216	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0546	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0696	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*17 Apr 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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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: 14 Apr 17  
 Lab Number: 17-W805  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 15:18  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW111

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.37	units	NA	SM 4500 H+ B	4 Apr 17 15:18	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	5 Apr 17 18:00	SVS
Temperature - Field	6.64	Degrees C	NA	SM 2550B	4 Apr 17 15:18	DJN
Conductivity - Field	3169	umhos/cm	1	EPA 120.1	4 Apr 17 15:18	DJN
Fluoride	2.27	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	1620	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	30.5	mg/l	1.0	SM4500-Cl-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	2720	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	140	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	0.15	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	6.89	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0174	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0662	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0904	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

CC  
17 Apr 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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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: 14 Apr 17  
 Lab Number: 17-W806  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 4 Apr 17 8:10  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVT L Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW117

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	4 Apr 17 8:10	DJN
pH	* 7.4	units	0.1	SM4500 H+ B	5 Apr 17 17:00	SVS
Temperature - Field	5.74	Degrees C	NA	SM 2550B	4 Apr 17 8:10	DJN
Conductivity - Field	8308	umhos/cm	1	EPA 120.1	4 Apr 17 8:10	DJN
Fluoride	0.19	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	5690	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	49.5	mg/l	1.0	SM4500-Cl-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	8920	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	418	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.2 @	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	8.82	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0226	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0032	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0279	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*17 Apr 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 sample quantity

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

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 14 Apr 17  
 Lab Number: 17-W807  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 5 Apr 17 11:03  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW103

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.94	units	NA	SM 4500 H+ B	5 Apr 17 11:03	DJN
pH	* 7.1	units	0.1	SM4500 H+ B	5 Apr 17 17:00	SVS
Temperature - Field	8.58	Degrees C	NA	SM 2550B	5 Apr 17 11:03	DJN
Conductivity - Field	1519	umhos/cm	1	EPA 120.1	5 Apr 17 11:03	DJN
Fluoride	0.76	mg/l	0.10	SM4500-F-C	11 Apr 17 17:00	SVS
Sulfate	453	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	19.8	mg/l	1.0	SM4500-CL-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	1040	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	83.5	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	1.55	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	0.0044	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	0.0029	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0231	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0252	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0608	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*17 Apr 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:

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 : = 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: 14 Apr 17  
 Lab Number: 17-W808  
 Work Order #: 82-0803  
 Account #: 002800  
 Date Sampled: 5 Apr 17 8:40  
 Date Received: 5 Apr 17 16:15  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

Sample Description: MW109

PO #: 165273

Event and Year: April 2017

Temp at Receipt: 2.0C

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.55	units	NA	SM 4500 H+ B	5 Apr 17 8:40	DJN
pH	* 7.0	units	0.1	SM4500 H+ B	5 Apr 17 17:00	SVS
Temperature - Field	6.14	Degrees C	NA	SM 2550B	5 Apr 17 8:40	DJN
Conductivity - Field	1668	umhos/cm	1	EPA 120.1	5 Apr 17 8:40	DJN
Fluoride	0.81	mg/l	0.10	SM4500-F-C	11 Apr 17 18:00	SVS
Sulfate	522	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	20.7	mg/l	1.0	SM4500-Cl-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	1160	mg/l	10	II750-85	7 Apr 17 14:26	SVS
Calcium - Total	94.8	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	2.06	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	0.0043	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	0.0024	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0210	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0252	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0673	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*17 Apr 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:  
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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: 14 Apr 17  
Lab Number: 17-W809  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 5 Apr 17  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

PO #: 165273

Sample Description: Dup 1

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH	* 7.3	units	0.1	SM4500 H+ B	5 Apr 17 17:00	SVS
Fluoride	1.29	mg/l	0.10	SM4500-F-C	11 Apr 17 18:00	SVS
Sulfate	528	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	19.1	mg/l	1.0	SM4500-Cl-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	1100	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	73.6	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	1.58	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	0.0023	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	0.0226	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	0.0596	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	0.0765	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC*  
*17 Apr 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  
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# = Due to concentration of other analytes  
+ = 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: 14 Apr 17  
Lab Number: 17-W810  
Work Order #: 82-0803  
Account #: 002800  
Date Sampled: 5 Apr 17  
Date Received: 5 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR

PO #: 165273

Sample Description: Field Blank (FB)

Temp at Receipt: 2.0C

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH	* 6.0	units	0.1	SM4500 H+ B	5 Apr 17 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	11 Apr 17 18:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	7 Apr 17 11:04	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	13 Apr 17 14:27	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 17 13:10	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	7 Apr 17 14:26	SVS
Calcium - Total	< 1	mg/l	1.0	6010	11 Apr 17 14:01	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	10 Apr 17 15:30	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	12 Apr 17 16:29	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	11 Apr 17 11:00	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	11 Apr 17 11:00	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	11 Apr 17 11:00	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K Carroll*

*17A-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



# Laboratories, Inc.

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

# Chain of Custody Record

<b>Project Name:</b> MDU Lewis and Clark	<b>Event:</b> April 2017	<b>Work Order Number:</b> 82-0803
<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 Nieswaag

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	
W800	MW110	3 April 17	1653	GW	X	X	X	6.95	1103	7.43	MDU CCR
W801	MW119	3 April 17	1840	GW	X	X	X	6.89	1197	7.46	
W802	MW210	4 April 17	1055	GW	X	X	X	8.62	1429	7.65	
W803	MW102	4 April 17	1320	GW	X	X	X	8.71	6812	7.01	
W804	MW118	4 April 17	1725	GW	X	X	X	6.13	7618	7.64	
W805	MW111	4 April 17	1518	GW	X	X	X	6.64	3169	7.37	
W806	MW117	4 April 17	0810	GW	X	X	X	5.74	8308	7.24	
W807	MW103	5 April 17	1103	GW	X	X	X	8.58	1519	7.94	
W808	MW109	5 April 17	0840	GW	X	X	X	6.14	1668	7.55	
W809	Dup 1	4 April 17	NA	GW	X	X	X	NA	NA	NA	
W810	Field Blank (FB)	5 April 17	NA	W	X	X	X	NA	NA	NA	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswaag</i>	5 April 17 1615	Log In Walk In #2	2.0°C TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>Darren Nieswaag</i>	5 April 2017 1615

# MVTL Calibration Worksheet

Site: NDU Loc

Technician: Darren Mieswaag

Date: <u>3 April 17</u>	Time: <u>0730</u>						
Instrument (Circle One): #1 650 MDS 08F100203 #2 650 MDS 04H14736 #3 556 MPS 12E102056	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7	<u>20.36</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-12.3</u>	0 +/- 50
	Buffer 10	<u>20.12</u>	<u>10.5</u>	<u>10.00</u>	9.95-10.05	<u>-192.0</u>	-180 +/- 50
Other:	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	Buffer 1413	<u>19.80</u>	<u>1419</u>	<u>1413</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>7.09</u>	<u>247.2</u>	<u>231.3</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>14.27</u>	<u>9.20</u>	<u>9.50</u>	mg/L	<u>705.4</u>	

Date: <u>4 April 17</u>	Time: <u>0715</u>						
Instrument (Circle One): #1 650 MDS 08F100203 #2 650 MDS 04H14736 #3 556 MPS 12E102056	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7	<u>19.97</u>	<u>7.02</u>	<u>7.00</u>	6.95-7.05	<u>-15.5</u>	0 +/- 50
	Buffer 10	<u>19.72</u>	<u>9.92</u>	<u>9.99</u>	9.95-10.05	<u>-188.9</u>	-180 +/- 50
Other:	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	Buffer 1413	<u>19.75</u>	<u>1416</u>	<u>1413</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>19.98</u>	<u>212.8</u>	<u>231.0</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>19.01</u>	<u>8.39</u>	<u>8.31</u>	mg/L	<u>708.6</u>	

# MVTL Calibration Worksheet

Site: MUCC

Technician: Darron Niesman

Date: <u>5 April 17</u>	Time: <u>0650</u>						
Instrument (Circle One): #1 650 MDS 08F100203 #2 650 MDS 04H14736 <u>#3 556 MPS 12E102056</u>	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7	<u>20.30</u>	<u>7.04</u>	<u>7.00</u>	6.95-7.05	<u>-17.5</u>	0 +/- 50
	Buffer 10	<u>20.15</u>	<u>10.03</u>	<u>10.00</u>	9.95-10.05	<u>-192.6</u>	-180 +/- 50
Other:	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	Buffer 1413	<u>20.46</u>	<u>1421</u>	<u>1413</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>20.03</u>	<u>229.3</u>	<u>231.0</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>23.82</u>	<u>6.73</u>	<u>7.89</u>	mg/L	<u>711.8</u>	

Date:	Time:						
Instrument (Circle One): #1 650 MDS 08F100203 #2 650 MDS 04H14736 #3 556 MPS 12E102056	<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
Other:	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	Buffer 1413				1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C				±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
					mg/L		



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	3 April 17	1401	9.21	
MW105	3 April 17	1414	8.95	
MW106	3 April 17	1412	9.61	
MW107	3 April 17	1403	4.35	
MW108	3 April 17	1410	16.95	
MW116	3 April 17	1406	9.92	



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Parren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	5 April 17	0851	0.45	
West Scrubber Pond Gauge	5 April 17	0850	0.60	
Stream behind Sewage Lagoon	5 April 17	1205	0.35	





# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2017

Sample ID: m w 110

Sampling Personal: Darren Nieswan

Weather Conditions: Temp: 58 °F Wind: W 5 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	No	Not Visible
Repairs Necessary:	_____		
Casing Diameter:	2"		
Water Level Before Purge:	9.28		ft
Total Well Depth:	-		ft
Well Volume:	-		liters
Depth to Top of Pump:	14.22		ft
Water Level After Sample:	9.40		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	6 sec.
Dedicated Equip?:	Yes	<input checked="" type="checkbox"/> No	Recover:	57 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	0.8
Duplicate Sample ID:	_____		Pumping Rate:	100 mL/min
Purge Date:	3 April 17	Time Purging Began:	15:13	am/pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	_____ am/pm
Sample Date:	3 April 17	Time of Sampling:	16:53	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	15:18	7.86	1103	7.43	2.72	63.3	27.0	149.34	500	Turbid
2	15:38	7.53	1101	7.43	2.45	66.8	30.4	9.38	2000	Clear
3	15:58	7.49	1103	7.43	2.42	68.3	20.5	9.34	2000	clear
4	16:08	7.37	1102	7.44	2.43	70.0	11.0	9.40	2000	clear
5	16:38	7.19	1102	7.43	2.41	71.2	5.62	9.42	2000	clear
6	16:49	7.08	1102	7.43	2.39	72.1	4.97	9.38	500	clear
7	16:48	7.01	1102	7.43	2.42	72.4	4.95	9.38	500	clear
8	16:53	6.95	1103	7.43	2.42	72.6	4.95	9.40	500	clear
9										
10										

Stabilized:  Yes  No

Total Volume Removed: 10000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: nw119  
Sampling Personal: Danna Nieswary

Weather Conditions: Temp: 50 °F Wind: W 15 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Not Visible
Repairs Necessary:	<input checked="" type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	9.09		ft
Total Well Depth:	-		ft
Well Volume:	-		liters
Depth to Top of Pump:	11.06		ft
Water Level After Sample:			ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	4 sec.
Dedicated Equip?:	Yes	<input checked="" type="checkbox"/> No	Recover:	56 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	3 April 17		Time Purging Began:	1755 am/pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	- am/pm
Sample Date:	3 April 17		Time of Sampling:	1840 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1800		7.46	1188	7.45	2.45	79.5	34.0	9.13	500	clear
2	1810		7.06	1198	7.46	1.50	9.5	14.6	9.16	1000	clear
3	1820		6.88	1197	7.46	1.44	1.7	6.93	9.16	1000	clear
4	1825		6.91	1197	7.46	1.41	-0.1	3.59	9.16	500	clear
5	1830		6.91	1197	7.46	1.39	0.1	2.30	9.16	500	clear
6	1835		6.91	1197	7.46	1.40	0.6	2.37	9.16	500	clear
7	1840		6.89	1197	7.46	1.40	1.0	2.29	9.16	500	clear
8											
9											
10											

Stabilized: Yes No  
Comments:

Total Volume Removed: 4500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 210  
Sampling Personal: Darren Nierway

Weather Conditions: \_\_\_\_\_ Temp: 41 °F Wind: NW 7 Precip: Sunny / Partly Cloudy / Cloudy

Well Information		
Well Locked?	<u>Yes</u> <input checked="" type="checkbox"/> <u>No</u> <input type="checkbox"/>	
Well Labeled?	<u>Yes</u> <input checked="" type="checkbox"/> <u>No</u> <input type="checkbox"/>	
Casing Straight?	<u>Yes</u> <input checked="" type="checkbox"/> <u>No</u> <input type="checkbox"/>	
Grout Seal Intact?	<u>Yes</u> <input checked="" type="checkbox"/> <u>No</u> <input type="checkbox"/>	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	<u>9.38</u>	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	<u>30.82</u>	ft
Water Level After Sample:	<u>11.72</u>	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information		
Purging Method:	Bladder	
Sampling Method:	Bladder	
Dedicated Equip?:	Yes <input type="checkbox"/>	<u>No</u> <input checked="" type="checkbox"/>
Duplicate Sample?:	Yes <input type="checkbox"/>	<u>No</u> <input checked="" type="checkbox"/>
Duplicate Sample ID:		
Control Settings		
Purge:	<u>8</u>	sec.
Recover:	<u>52</u>	sec.
PSI:	<u>-</u>	
Pumping Rate:	<u>100</u>	mL/min
Purge Date:	<u>4 April 17</u>	Time Purging Began: <u>0935</u> am/pm
Well Purged Dry?	<u>Yes</u> <input checked="" type="checkbox"/>	<u>No</u> <input type="checkbox"/>
Sample Date:	<u>4 April 17</u>	Time Purged Dry: _____ am/pm
		Time of Sampling: <u>1055</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	0940	8.02	1429	7.68	4.58	197.0	36.7	10.41	500	clear
2	1000	8.54	1428	7.65	0.32	73.7	26.3	11.30	2000	clear
3	1020	8.69	1430	7.65	0.29	19.31.9	15.6	11.52	2000	dr
4	1040	8.58	1430	7.66	0.26	-58.3	6.89	11.69	2000	dr
5	1045	8.63	1430	7.65	0.25	-65.8	4.95	11.72	500	dr
6	1050	8.64	1428	7.65	0.24	-69.8	4.89	11.72	500	dr
7	1055	8.62	1429	7.65	0.24	-71.6	6.68	11.72	500	dr
8										
9										
10										

Total Volume Removed: 8,000 mL

Stabilized: Yes  No   
Comments: \_\_\_\_\_

\* on 4 April 17



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 102  
Sampling Personal: Janna Mesway

Weather Conditions: Temp: 49 °F Wind: NW 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:	<u>2"</u>		
Water Level Before Purge:	<u>18.71</u> ft		
Total Well Depth:	<u>-</u> ft		
Well Volume:	<u>-</u> liters		
Depth to Top of Pump:	<u>20.24</u> ft		
Water Level After Sample:	<u>19.12</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>7</u> sec.
Dedicated Equip?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Recover:	<u>53</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI:	<u>-0.6</u>
Duplicate Sample ID:	<u>-</u>	Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>4 April 17</u>	Time Purging Began:	<u>1200</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>4 April 17</u>	Time of Sampling:	<u>1320</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1225		8.66	6684	7.01	0.33	2.1	22.3	19.08	2000	clear
3	1245		8.88	6708	7.01	0.29	1.3	12.5	19.12	2000	clear
4	1305		8.90	6775	7.01	0.24	-2.0	5.89	19.12	2000	clear
5	1310		8.82	6795	7.01	0.21	-3.3	4.54	19.12	500	clear
6	1315		8.89	6804	7.01	0.20	-4.0	4.43	19.12	500	clear
7	1320		8.71	6812	7.01	0.21	-4.5	4.31	19.12	500	clear
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 8000 mL

Comments:

1



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 118  
Sampling Personal: Darren Meservey

Weather Conditions: Temp: 47 °F Wind: W 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:	8.63	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	9.90	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:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		PSI:	0B
Duplicate Sample ID:	Dup-1		Pumping Rate: 100 mL/min	
Purge Date:	4 April 17	Time Purging Began:	1620	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:		am/pm
Sample Date:	4 April 17	Time of Sampling:	1725	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter Nitric		

### Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond.	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid	
1	1625	8.13	1551	7.62	6.78	38.6	4.77	8.71	500	Turbid Brown
2	1645	6.86	1608	7.63	4.93	43.9	14.7	8.71	2000	Turbid
3	*1630	5.89	1609	7.64	4.42	46.4	14.6	8.71	2000	clear
4	1715	6.10	1615	7.64	4.54	45.4	3.72	8.71	1000	clear
5	1720	6.08	1617	7.64	4.44	45.6	3.75	8.71	500	clear
6	1725	6.13	1618	7.64	4.41	44.6	3.60	8.71	500	clear
7										
8										
9										
10										

Stabilized: Yes  No   
Comments: Done  
4 April 17

Total Volume Removed: 6500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW11  
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 43 °F Wind: NW Precip: Sunny / Partly Cloudy / (Cloudy)

### Well Information

Well Locked?	Yes <input checked="" 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.00		ft
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	13.38		ft
Water Level After Sample:	8.10		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	6 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	58 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	-
Duplicate Sample ID:	<input type="checkbox"/>		Pumping Rate:	100 mL/min
Purge Date:	4 April 17	Time Purging Began:	1423	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	4 April 17	Time of Sampling:	1518	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1448		6.51	3139	7.35	2.26	86.2	10.3	8.09	5200	clear
3	1458		6.37	3150	7.36	2.58	91.0	6.08	8.10	1000	clear
4	1503		6.50	3115	7.36	2.66	93.4	3.70	8.09	500	clear
5	1508		6.61	3164	7.37	2.79	94.2	2.54	8.10	500	clear
6	1513		6.65	3166	7.37	2.80	95.2	2.47	8.10	500	clear
7	1518		6.64	3169	7.37	2.82	96.0	2.44	8.10	500	clear
8											
9											
10											

Stabilized: Yes  No

Comments:

Total Volume Removed: ~~4500~~ mL 5500

DM 4 April 17









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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 109  
Sampling Personal: Darren N. Gray

Weather Conditions: Temp: 26 °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"/>	<u>Not Visible</u>
Repairs Necessary:			
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>*13.2 10.13</u> ft		
Total Well Depth:	ft		
Well Volume:	liters		
Depth to Top of Pump:	<u>13.20</u> 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?:	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>-</u>
Duplicate Sample ID:	<u>-</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>5 April 17</u>	Time Purging Began:	<u>0750</u>	<u>am/pm</u>
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	<u>-</u> am/pm
Sample Date:	<u>5 April 17</u>	Time of Sampling:	<u>0840</u>	<u>am/pm</u>
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	0815	6.11	1660	7.41	0.38	153.5	7.82	10.65	2000	clear
3	0825	6.08	1666	7.48	0.35	140.0	2.28	10.68	<del>500</del> 1000	clear
4	0830	6.34	1663	7.50	0.35	136.3	0.94	10.68	500	clear
5	0835	6.19	1662	7.53	0.35	128.5	0.85	10.68	500	clear
6	0840	6.14	1668	7.55	0.35	122.4	0.88	10.68	500	clear
7										
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 5000 mL

Comments:

\* on 5 April 17



**CASE NARRATIVE – AMENDED 14 JUN 17 (Radiochem results on 17-W825 & 17-W830)**

**MVTL Lab Reference No/SDG:** 201782-0810  
**IML Lab Reference No/SDG:** S1704141  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – April 2017 Event  
**MVTL Laboratory Identifications:** 17-W821 through 17-W831  
**IM Laboratory Identifications:** S1704141-001 through S1704141-011  
**Page 1 of 2**

MDU Sample Identification	IML Sample Identification	MVTL Laboratory #
MW110	S1704141-001	17-W821
MW119	S1704141-002	17-W822
MW210	S1704141-003	17-W823
MW102	S1704141-004	17-W824
MW118	S1704141-005	17-W825
MW111	S1704141-006	17-W826
MW117	S1704141-007	17-W827
MW103	S1704141-008	17-W828
MW109	S1704141-009	17-W829
Dup 1	S1704141-010	17-W830
Field Blank (FB)	S1704141-011	17-W831

**I. RECEIPT**

- All samples were received at the laboratory on 5 Apr 17 at 1615.
- 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 ambient.
- 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 11 Apr 17.
  - 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.



**CASE NARRATIVE – AMENDED 14 JUN 17 (Radiochem results on 17-W825 & 17-W830)**

**MVTL Lab Reference No/SDG:** 201782-0810  
**IML Lab Reference No/SDG:** S1704141  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – April 2017 Event  
**MVTL Laboratory Identifications:** 17-W821 through 17-W831  
**IM Laboratory Identifications:** S1704141-001 through S1704141-011  
Page 2 of 2

**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.

**V. REPORTING**

- Per email dated 30 May 2017 from Terri Olson at Barr, samples 17-W825 and 17-W830 were recounted for Radium 228.

All laboratory data has been approved by MVTL Laboratories.

**SIGNED:** Claudette Carroll **DATE:** 14 Jun 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager

## Claudette Carroll

---

**From:** Terri A. Olson <TOlson@barr.com>  
**Sent:** Tuesday, May 30, 2017 7:07 PM  
**To:** Claudette Carroll  
**Subject:** RE: Emailing - 201782-0810 MDU L&C RADIOCHEM APR 17.pdf

Hi Claudette,

We have a source and field duplicate for Rad 228 that don't match well. The FD = <1 and the source (MW118) = 3.0. Please have the lab check these results.

Thanks,

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:** Friday, May 19, 2017 4:01 PM  
**To:** Barr Data Management <[BarrDM@barr.com](mailto:BarrDM@barr.com)>; Marshall, Samantha <[Samantha.Marshall@mdu.com](mailto:Samantha.Marshall@mdu.com)>; Terri A. Olson <[TOlson@barr.com](mailto:TOlson@barr.com)>; Justin Soberaski <[JSoberaski@barr.com](mailto:JSoberaski@barr.com)>  
**Subject:** Emailing - 201782-0810 MDU L&C RADIOCHEM APR 17.pdf

Hello all,

Attached is a set of Radiochem data for MDU Lewis & Clark from the sampling done in April. Hard copies to follow to Sam.

Have a wonderful weekend!

Claudette



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[ccarroll@mvtl.com](mailto:ccarroll@mvtl.com)  
701-258-9720  
2616 E. Broadway Ave/Bismarck, ND 58501



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www.mvttl.com



## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W821  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 3 Apr 17 16:53  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW110

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.43	units	NA	SM 4500 H+ B	3 Apr 17 16:53	DJN
Temperature - Field	6.95	Degrees C	NA	SM 2550B	3 Apr 17 16:53	DJN
Conductivity - Field	1103	umhos/cm	1	EPA 120.1	3 Apr 17 16:53	DJN
Radium 226	See Attached Report				3 May 17	OL
Radium 228	See Attached Report				29 Apr 17	OL

Approved by:

*Claudette K Carroll* <sup>CC</sup> 19 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W822  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 3 Apr 17 18:40  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW119

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.46	units	NA	SM 4500 H+ B	3 Apr 17 18:40	DJN
Temperature - Field	6.89	Degrees C	NA	SM 2550B	3 Apr 17 18:40	DJN
Conductivity - Field	1197	umhos/cm	1	EPA 120.1	3 Apr 17 18:40	DJN
Radium 226	See Attached Report				3 May 17	OL
Radium 228	See Attached Report				2 May 17	OL

Approved by:

*Claudette K Carroll* <sup>CC</sup> 19 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:

0 = 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: 18 May 17  
Lab Number: 17-W823  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 4 Apr 17 10:55  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW210

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.65	units	NA	SM 4500 H+ B	4 Apr 17 10:55	DJN
Temperature - Field	8.62	Degrees C	NA	SM 2550B	4 Apr 17 10:55	DJN
Conductivity - Field	1429	umhos/cm	1	EPA 120.1	4 Apr 17 10:55	DJN
Radium 226	See Attached Report				3 May 17	OL
Radium 228	See Attached Report				2 May 17	OL

Approved by: Claudette K Carroll <sup>CC</sup> 19 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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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17
Lab Number: 17-W824
Work Order #: 82-0810
Account #: 002800
Date Sampled: 4 Apr 17 13:20
Date Received: 4 Apr 17 16:15
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem
Sample Description: MW102

Temp at Receipt: Ambient

Event and Year: April 2017

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include pH - Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

Approved by:

Claudette K. Carroll 19 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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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17
Lab Number: 17-W825
Work Order #: 82-0810
Account #: 002800
Date Sampled: 4 Apr 17 17:25
Date Received: 4 Apr 17 16:15
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem
Sample Description: MW118

Temp at Receipt: Ambient

Event and Year: April 2017

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, and Analyst. Rows include pH - Field, Temperature - Field, Conductivity - Field, Radium 226, and Radium 228.

Approved by: Claudette K. Carroll 19 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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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W826  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 4 Apr 17 15:18  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW111

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.37	units	NA	SM 4500 H+ B	4 Apr 17 15:18	DJN
Temperature - Field	6.64	Degrees C	NA	SM 2550B	4 Apr 17 15:18	DJN
Conductivity - Field	3169	umhos/cm	1	EPA 120.1	4 Apr 17 15:18	DJN
Radium 226	See Attached Report				3 May 17	OL
Radium 228	See Attached Report				2 May 17	OL

Approved by: Claudette K Carroll <sup>CC</sup> 19 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W827  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 4 Apr 17 8:10  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW117

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	4 Apr 17	8:10	DJN
Temperature - Field	5.74	Degrees C	NA	SM 2550B	4 Apr 17	8:10	DJN
Conductivity - Field	8308	umhos/cm	1	EPA 120.1	4 Apr 17	8:10	DJN
Radium 226	See Attached Report				3 May 17		OL
Radium 228	See Attached Report				2 May 17		OL

Approved by:

*Claudette K. Carroll* 19 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W828  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 4 Apr 17 11:03  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW103

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.94	units	NA	SM 4500 H+ B	5 Apr 17 11:03	DJN
Temperature - Field	8.58	Degrees C	NA	SM 2550B	5 Apr 17 11:03	DJN
Conductivity - Field	1519	umhos/cm	1	EPA 120.1	5 Apr 17 11:03	DJN
Radium 226	See Attached Report				3 May 17	OL
Radium 228	See Attached Report				2 May 17	OL

Approved by:

*Claudette K Carroll*

*19 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W829  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 5 Apr 17 8:40  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: MW109

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	7.55	units	NA	SM 4500 H+ B	5 Apr 17	8:40	DJN
Temperature - Field	6.14	Degrees C	NA	SM 2550B	5 Apr 17	8:40	DJN
Conductivity - Field	1668	umhos/cm	1	EPA 120.1	5 Apr 17	8:40	DJN
Radium 226	See Attached Report				3 May 17		OL
Radium 228	See Attached Report				2 May 17		OL

Approved by:

*Cc*  
Claudette K Carroll 19 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W830  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 4 Apr 17  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark CCR Radiochem  
Sample Description: Dup1

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			3 May 17	OL
Radium 228	See Attached Report			3 May 17	OL

Approved by:

*C*  
Claudette K Carroll 19 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: 11 of 11

## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 18 May 17  
Lab Number: 17-W831  
Work Order #: 82-0810  
Account #: 002800  
Date Sampled: 5 Apr 17  
Date Received: 4 Apr 17 16:15  
Sampled By: MVTL Field Services

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

Temp at Receipt: Ambient

Event and Year: April 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Radium 226	See Attached Report			3 May 17	OL
Radium 228	See Attached Report			3 May 17	OL

Approved by:

*CC*  
Claudette K Carroll 19 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: 6/14/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782-0810  
**Lab Order:** S1704141

**CASE NARRATIVE**

**Report ID:** S1704141002  
(Replaces S1704141001)

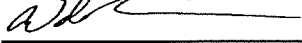
Samples 17-W821 Mw110, 17-W822 MW 119, 17-W823 MW210, 17-W824 MW102, 17-W825 MW118, 17-W826 MW111, 17-W827 MW117, 17-W828 MW103, 17-W829 MW109, 17-W830 Dup 1, and 17-W831 Field Blank were received on April 11, 2017.

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.

Report S1704141002 replaces report S1704141001. Client requested a recount on samples S1704141-005 and S1705141-010 revised results reported.

Reviewed by:   
Wade Nieuwsma, Assistant Laboratory Manager





Sample Analysis Report

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

Date Reported 6/14/2017
Report ID S1704141002
(Replaces S1704141001)

ProjectName: 201782-0810
Lab ID: S1704141-001
ClientSample ID: 17-W821 Mw110
COC: 201782-0810

WorkOrder: S1704141
CollectionDate: 4/3/2017 4:53:00 PM
DateReceived: 4/11/2017 11:29:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include 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

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-002  
**ClientSample ID:** 17-W822 MW119  
**COC:** 201782-0810

**Date Reported:** 6/14/2017  
**Report ID:** S1704141002  
(Replaces S1704141001)  
**WorkOrder:** S1704141  
**CollectionDate:** 4/3/2017 6:40:00 PM  
**DateReceived:** 4/11/2017 11:29:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.03	pCi/L		0.2	SM 7500 Ra-B	05/03/2017 954	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	05/03/2017 954	MB
Radium 228	0.6	pCi/L		1	Ga-Tech	05/02/2017 052	MB
Radium 228 Precision (±)	1.3	pCi/L			Ga-Tech	05/02/2017 052	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

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-003  
**ClientSample ID:** 17-W823 MW210  
**COC:** 201782-0810

**Date Reported:** 6/14/2017  
**Report ID:** S1704141002  
(Replaces S1704141001)  
**WorkOrder:** S1704141  
**CollectionDate:** 4/4/2017 10:55:00 AM  
**DateReceived:** 4/11/2017 11:29:00 AM  
**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	05/03/2017 954	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/03/2017 954	MB
Radium 228	-0.5	pCi/L		1	Ga-Tech	05/02/2017 355	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	05/02/2017 355	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

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-004  
**ClientSample ID:** 17-W824 MW102  
**COC:** 201782-0810

**Date Reported:** 6/14/2017  
**Report ID:** S1704141002  
(Replaces S1704141001)  
**WorkOrder:** S1704141  
**CollectionDate:** 4/4/2017 1:20:00 PM  
**DateReceived:** 4/11/2017 11:29:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

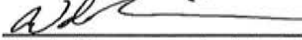
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	05/03/2017 954	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/03/2017 954	MB
Radium 228	0.1	pCi/L		1	Ga-Tech	05/02/2017 659	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	05/02/2017 659	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, Assistant Laboratory Manager



### Sample Analysis Report

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

**Date Reported** 6/14/2017  
**Report ID** S1704141002  
(Replaces S1704141001)

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-005  
**ClientSample ID:** 17-W825 MW118  
**COC:** 201782-0810

**WorkOrder:** S1704141  
**CollectionDate:** 4/4/2017 5:25:00 PM  
**DateReceived:** 4/11/2017 11:29:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

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

#### Radionuclides - Total

Radium 226	0.1	pCi/L		0.2	SM 7500 Ra-B	05/03/2017 954 MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	05/03/2017 954 MB
Radium 228	-0.2	pCi/L		1	Ga-Tech	05/02/2017 1003 MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	05/02/2017 1003 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

ProjectName: 201782-0810
Lab ID: S1704141-006
ClientSample ID: 17-W826 MW111
COC: 201782-0810

Date Reported 6/14/2017
Report ID S1704141002
(Replaces S1704141001)
WorkOrder: S1704141
CollectionDate: 4/4/2017 3:18:00 PM
DateReceived: 4/11/2017 11:29:00 AM
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

ProjectName: 201782-0810
Lab ID: S1704141-007
ClientSample ID: 17-W827 MW117
COC: 201782-0810

Date Reported 6/14/2017
Report ID S1704141002
(Replaces S1704141001)
WorkOrder: S1704141
CollectionDate: 4/4/2017 8:10:00 AM
DateReceived: 4/11/2017 11:29:00 AM
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 6/14/2017
Report ID S1704141002
(Replaces S1704141001)

ProjectName: 201782-0810
Lab ID: S1704141-008
ClientSample ID: 17-W828 MW103
COC: 201782-0810

WorkOrder: S1704141
CollectionDate: 4/5/2017 11:03:00 AM
DateReceived: 4/11/2017 11:29:00 AM
FieldSampler:
Matrix: Water

Comments

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

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** 6/14/2017  
**Report ID** S1704141002  
(Replaces S1704141001)

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-009  
**ClientSample ID:** 17-W829 MW109  
**COC:** 201782-0810

**WorkOrder:** S1704141  
**CollectionDate:** 4/5/2017 8:40:00 AM  
**DateReceived:** 4/11/2017 11:29:00 AM  
**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	05/03/2017 954 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	05/03/2017 954 MB
Radium 228	2.2	pCi/L		1	Ga-Tech	05/02/2017 2218 MB
Radium 228 Precision (±)	1.4	pCi/L			Ga-Tech	05/02/2017 2218 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** 6/14/2017  
**Report ID** S1704141002  
(Replaces S1704141001)

**ProjectName:** 201782-0810  
**Lab ID:** S1704141-010  
**ClientSample ID:** 17-W830 Dup 1  
**COC:** 201782-0810

**WorkOrder:** S1704141  
**CollectionDate:** 4/4/2017  
**DateReceived:** 4/11/2017 11:29:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.02	pCi/L		0.2	SM 7500 Ra-B	05/03/2017 954	MB
Radium 226 Precision (±)	0.03	pCi/L			SM 7500 Ra-B	05/03/2017 954	MB
Radium 228	-1.2	pCi/L		1	Ga-Tech	05/03/2017 122	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	05/03/2017 122	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

ProjectName: 201782-0810
Lab ID: S1704141-011
ClientSample ID: 17-W831 Field Blank
COC: 201782-0810

Date Reported 6/14/2017
Report ID S1704141002
(Replaces S1704141001)
WorkOrder: S1704141
CollectionDate: 4/5/2017
DateReceived: 4/11/2017 11:29:00 AM
FieldSampler:
Matrix: Water

Comments

Table with 7 columns: Analyses, Result, Units, Qual, RL, Method, Date Analyzed/Init. Rows include 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



### ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.  
Work Order: S1704141  
Project: 201782-0810

Date: 6/14/2017  
Report ID: S1704141002  
(Replaces S1704141001)

**Radium 228 by Ga/Tech**

Sample Type **MBLK**

Units: pCi/L

MB-430 (04/26/17 11:52)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228 ND 1

MB-431 (05/01/17 09:36)	RunNo: 145484	PrepDate: 04/17/17 14:00	BatchID 13123
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228 ND 1

**Radium 228 by Ga/Tech**

Sample Type **LCS**

Units: pCi/L

LCS-430 (04/26/17 14:57)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228 39 1 40.1 98.1 65.9 - 132

LCS-431 (05/01/17 12:40)	RunNo: 145484	PrepDate: 04/17/17 14:00	BatchID 13123
Analyte	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 **LCSD**

Units: pCi/L

LCSD-430 (04/26/17 18:01)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228 41 1 39 3.17 101 20

**Radium 228 by Ga/Tech**

Sample Type **MS**

Units: pCi/L

S1704140-003AMS (04/28/17 15:59)	RunNo: 145297	PrepDate: 04/17/17 14:00	BatchID 13102
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228 25 1 40.1 ND 62.8 50 - 139

MS-431 (05/01/17 18:44)	RunNo: 145484	PrepDate: 04/17/17 14:00	BatchID 13123
Analyte	Result	RL	Spike Ref Samp %REC % Rec Limits Qual

Total Radium 228 49 1 40.1 ND 121 50 - 132

**Radium 228 by Ga/Tech**

Sample Type **MSD**

Units: pCi/L

MSD-431 (05/01/17 21:48)	RunNo: 145484	PrepDate: 04/17/17 14:00	BatchID 13123
Analyte	Result	RL	Conc %RPD %REC % RPD Limits Qual

Total Radium 228 45 1 49 7.52 112 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: S1704141  
Project: 201782-0810

Date: 6/14/2017  
Report ID: S1704141002  
(Replaces S1704141001)

**Radium 226 in Water -**

Sample Type **MBLK**

Units: pCi/L

MB-1744 (05/03/17 09:54)	RunNo: 145430	PrepDate: 04/27/17 0:00	BatchID 13118						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	ND	0.2							

**Radium 226 in Water -**

Sample Type **LCS**

Units: pCi/L

LCS-1744 (05/03/17 09:54)	RunNo: 145430	PrepDate: 04/27/17 0:00	BatchID 13118						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	6.6	0.2	5.89		112	67.1 - 122			

**Radium 226 in Water -**

Sample Type **LCSD**

Units: pCi/L

LCSD-1744 (05/03/17 09:54)	RunNo: 145430	PrepDate: 04/27/17 0:00	BatchID 13118						
Analyte	Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual		
Radium 226	6.7	0.2	6.6	0.987	113	20			

**Radium 226 in Water -**

Sample Type **MS**

Units: pCi/L

S1704141-001AMS (05/03/17 09:54)	RunNo: 145430	PrepDate: 04/27/17 0:00	BatchID 13118						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual		
Radium 226	10.6	0.2	11.8	ND	90.1	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

201782-0810

Company Name and Address:  <b>MVTL</b> 2616 E Broadway Bismarck, ND 58501	Account #:	Phone #: 701-258-9720
	Contact: Claudette	Fax #: For faxed report check box <input type="checkbox"/>
Billing Address (indicate if different from above):  PO Box 249 New Ulm, MN 56073	Name of Sampler:	E-mail: ccarroll@mvtl.com For e-mail report check box <input type="checkbox"/>
	Quote Number	Date Submitted: 7-Apr-17
	Project Name/Number:	Purchase Order #: BL5829

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
51704041 1 un 5/8/17 001	17-W821	Mw110	GW	3-Apr-17	1653		4				Ra226 & Ra228
002	17-W822	MW119	GW	3-Apr-17	1840		4				Ra226 & Ra228
003	17-W823	MW210	GW	4-Apr-17	1055		4				Ra226 & Ra228
004	17-W824	MW102	GW	4-Apr-17	1320		4				Ra226 & Ra228
005	17-W825	MW118	GW	4-Apr-17	1725		4				Ra226 & Ra228
006	17-W826	MW111	GW	4-Apr-17	1518		4				Ra226 & Ra228
007	17-W827	MW117	GW	4-Apr-17	810		4				Ra226 & Ra228
008	17-W828	MW103	GW	5-Apr-17	1103		4				Ra226 & Ra228
009	17-W829	MW109	GW	5-Apr-17	840		4				Ra226 & Ra228
010	17-W830	Dup 1	GW	4-Apr-17			4				Ra226 & Ra228
011	17-W831	Field Blank	GW	5-Apr-17			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	7-Apr-17	1700		<i>A. Simonson</i>	4/11/17	11.2
2.						

# MVTL Calibration Worksheet

Site: MDU LCL

Technician: Darren Meswras

Date: <u>3 April 17</u>	Time: <u>0730</u>						
<b>Instrument (Circle One):</b>	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
#1 650 MDS 08F100203	Buffer 7	<u>20.36</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-12.3</u>	0 +/- 50
#2 650 MDS 04H14736	Buffer 10	<u>20.12</u>	<u>10.05</u>	<u>10.00</u>	9.95-10.05	<u>-192.0</u>	-180 +/- 50
#3 <u>556 MPS 12E102056</u>	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
Other:	Buffer 1413	<u>19.80</u>	<u>1419</u>	<u>1413</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>7.09</u>	<u>247.2</u>	<u>231.3</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>14.27</u>	<u>9.20</u>	<u>9.50</u>	mg/L	<u>705.4</u>	

Date: <u>4 April 17</u>	Time: <u>0715</u>						
<b>Instrument (Circle One):</b>	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
#1 650 MDS 08F100203	Buffer 7	<u>19.97</u>	<u>7.02</u>	<u>7.00</u>	6.95-7.05	<u>-15.5</u>	0 +/- 50
#2 650 MDS 04H14736	Buffer 10	<u>19.72</u>	<u>9.92</u>	<u>9.99</u>	9.95-10.05	<u>-188.9</u>	-180 +/- 50
#3 <u>556 MPS 12E102056</u>	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
Other:	Buffer 1413	<u>19.75</u>	<u>1416</u>	<u>1413</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>19.98</u>	<u>212.8</u>	<u>231.0</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>19.01</u>	<u>8.39</u>	<u>8.31</u>	mg/L	<u>708.6</u>	



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: nw110  
 Sampling Personal: Darren Niesura

Weather Conditions: Temp: 58 °F Wind: WS 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:	9.28	ft
Total Well Depth:	-	
Well Volume:	-	
Depth to Top of Pump:	14.22	ft
Water Level After Sample:	9.40	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings	
Sampling Method:	Bladder	Purge:	6 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover:	57 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI:	0.8
Duplicate Sample ID:	Pumping Rate: 100 mL/min		
Purge Date:	3 April 17	Time Purging Began:	1513 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	3 April 17	Time of Sampling:	1653 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter Nitric	

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1518	7.86	1103	7.43	2.72	63.3	27.0	9.34	500	Turbid
2	1538	7.53	1101	7.43	2.45	66.8	30.4	9.38	2000	Clear
3	1558	7.49	1103	7.43	2.42	68.3	20.5	9.34	2000	clear
4	1618	7.37	1102	7.44	2.43	70.0	11.0	9.40	2000	clear
5	1638	7.19	1102	7.43	2.41	71.2	5.62	9.42	2000	clear
6	1649	7.08	1102	7.43	2.39	72.1	4.97	9.38	500	clear
7	1648	7.01	1102	7.43	2.42	72.4	4.95	9.38	500	clear
8	1653	6.95	1103	7.43	2.42	72.6	4.95	9.40	500	clear
9										
10										

Stabilized: Yes No  
 Comments:

Total Volume Removed: 10000 mL





# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2017

Sample ID: MW119

Sampling Personal: DARRIN NIESWANG

Weather Conditions: Temp: 30 °F Wind: W 5 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	<del>Yes</del> No	
Well Labeled?	Yes No	
Casing Straight?	Yes No	
Grout Seal Intact?	Yes No	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	9.09	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	11.06	ft
Water Level After Sample:		ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 4 sec.
Dedicated Equip?:	Yes (No)	Recover: 56 sec.
Duplicate Sample?:	Yes (No)	PSI: —
Duplicate Sample ID:		Pumping Rate: 100 mL/min
Purge Date:	3 April 17	Time Purging Began: 12:55 am/pm
Well Purged Dry?	Yes (No)	Time Purged Dry: — am/pm
Sample Date:	3 April 17	Time of Sampling: 18:40 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	18:00	7.46	1188	7.45	2.45	79.5	9.13	500	clear
2	18:10	7.06	1198	7.46	1.50	9.5	9.16	1000	clear
3	18:20	6.88	1197	7.46	1.44	1.7	6.93	1000	clear
4	18:25	6.91	1197	7.46	1.41	-0.1	3.59	500	clear
5	18:30	6.91	1197	7.46	1.39	0.1	2.30	500	clear
6	18:35	6.91	1197	7.46	1.40	0.6	2.37	500	clear
7	18:40	6.89	1197	7.46	1.40	1.0	2.29	500	clear
8									
9									
10									

Stabilized: Yes No

Total Volume Removed: 4500 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW210  
Sampling Personal: *Warren Nicaway*

Weather Conditions: Temp: *41* °F Wind: *NW 7* 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:	<i>9.38</i>		ft
Total Well Depth:			
Well Volume:	liters		
Depth to Top of Pump:	<i>30.82</i>		ft
Water Level After Sample:	<i>11.72</i>		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<i>8</i> sec.
Dedicated Equip?:	Yes	<input checked="" type="checkbox"/> No	Recover:	<i>52</i> sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	<i>-</i>
Duplicate Sample ID:			Pumping Rate:	<i>100</i> mL/min
Purge Date:	<i>4 April 17</i>	Time Purging Began:	<i>0935</i>	<input checked="" type="checkbox"/> am/pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	<i>-</i> am/pm
Sample Date:	<i>4 April 17</i>	Time of Sampling:	<i>1053</i>	<input checked="" type="checkbox"/> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	0940	8.02	1429	7.68	4.58	197.0	36.7	10.41	500	clear
2	1000	8.54	1428	7.65	0.32	73.7	26.3	11.30	2000	clear
3	1020	8.69	1430	7.65	0.29	31.9	15.6	11.52	2000	clear
4	1040	8.58	1430	7.66	0.26	58.3	6.89	11.69	2000	clear
5	1045	8.63	1430	7.65	0.25	65.8	4.95	11.72	500	clear
6	1050	8.64	1428	7.65	0.24	69.8	4.89	11.72	500	clear
7	1055	8.62	1429	7.65	0.24	71.6	6.68	11.72	500	clear
8										
9										
10										

Stabilized:  Yes  No

Total Volume Removed: *8,000* mL

Comments:

*SN 4 April 17*



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 102  
Sampling Personal: *[Signature]*

Weather Conditions: Temp: 49 °F Wind: N11 Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	18.71 ft		
Total Well Depth:	ft		
Well Volume:	liters		
Depth to Top of Pump:	20.24 ft		
Water Level After Sample:	19.12 ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings	
Sampling Method:	Bladder	Purge:	7 sec.
Dedicated Equip?:	Yes No	Recover:	53 sec.
Duplicate Sample?:	Yes No	PSI:	-0.6
Duplicate Sample ID:	Pumping Rate: 100 mL/min		
Purge Date:	4 April 17	Time Purging Began:	1200 am/pm
Well Purged Dry?:	Yes No	Time Purged Dry:	am/pm
Sample Date:	4 April 17	Time of Sampling:	1320 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter Nitric	

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1225	8.66	6684	7.01	0.33	2.1	22.3	19.08	2000	clear
3	1245	8.88	6708	7.01	0.29	1.3	12.5	19.12	2000	clear
4	1305	8.90	6725	7.01	0.24	-2.0	5.89	19.12	2000	clear
5	1310	8.82	6725	7.01	0.21	-3.3	4.54	19.12	500	clear
6	1315	8.89	6804	7.01	0.20	-4.0	4.43	19.12	500	clear
7	1320	8.71	6812	7.01	0.21	-4.5	4.31	19.12	500	clear
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 8000 mL

Comments:

*[Handwritten mark]*



2816 E. Broadway Ave, Bismarck, ND  
Phone: (701) 258-9720

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW118  
Sampling Personal: *Darrin Meservey*

Weather Conditions: Temp: 47 °F Wind: h/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?	<u>Yes</u> No	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	8.63	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	9.90	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	<u>NO</u>	Recover:	55 sec.
Duplicate Sample?:	<u>Yes</u>	No	PSI:	0B
Duplicate Sample ID:	Dup-1		Pumping Rate:	100 mL/min
Purge Date:	4 April 17	Time Purging Began:	1620	am/pm
Well Purged Dry?	Yes	<u>NO</u>	Time Purged Dry:	
Sample Date:	4 April 17	Time of Sampling:	1725	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter Nitric		

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1645	6.86	1608	7.63	4.93	43.9	147	8.71	2000	Turbid
3	*16305	5.89	1609	7.64	4.42	46.4	14.6	8.71	2000	clear
4	1715	6.10	1615	7.64	4.54	45.4	3.72	8.71	1000	clear
5	1720	6.08	1617	7.64	4.44	45.6	3.75	8.71	500	clear
6	1725	6.13	1618	7.64	4.41	44.6	3.60	8.71	500	clear
7										
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 6500 mL

Comments: *\* on 4 April 17*



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW111  
Sampling Personal: Darren Niswaga

Weather Conditions: \_\_\_\_\_ Temp: 43 °F Wind: NW 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.00 ft		
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	13.38 ft		
Water Level After Sample:	8.10 ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>6</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	Recover: <u>58</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: <u>-</u>
Duplicate Sample ID:	<u>-</u>	Pumping Rate: <u>1.00</u> mL/min
Purge Date:	<u>4 April 17</u>	Time Purging Began: <u>1423</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry: <u>-</u> am/pm
Sample Date:	<u>4 April 17</u>	Time of Sampling: <u>1518</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	1428	6.89	3640	7.15	0.62	76.1	53.1	8.11	500	Slightly Turbid
2	1448	6.51	3139	7.35	2.26	86.2	10.3	8.09	5200	clear
3	1458	6.37	3150	7.36	2.58	91.0	6.08	8.10	1000	clear
4	1503	6.50	3115	7.36	2.66	93.4	3.70	8.09	500	clear
5	1508	6.61	3164	7.37	2.79	94.2	2.54	8.10	500	clear
6	1513	6.65	3166	7.37	2.80	95.2	2.47	8.10	500	clear
7	1518	6.64	3169	7.37	2.82	96.0	2.44	8.10	500	clear
8										
9										
10										

Stabilized: Yes  No

Comments: (circled)

Total Volume Removed: ~~6500~~ mL 6500

DN 4 April 17



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW117  
Sampling Personal: Darren Nieswanger

Weather Conditions: Temp: 39°F Wind: NW 4 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:	5.53	ft
Total Well Depth:	_____	ft
Well Volume:	_____	liters
Depth to Top of Pump:	7.72	ft
Water Level After Sample:	7.72	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	6 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Recover:	54 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		PSI:	08
Duplicate Sample ID:	_____		Pumping Rate:	100 mL/min
Purge Date:	3 April 17	Time Purging Began:	1425	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry:	1505	am/pm
Sample Date:	3 April 17	Time of Sampling:	0810	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1430	7.16	8280	7.21	8.25	42.0	66.2	6.02	500	clear slightly turbid	
2	1440	6.87	8303	7.21	8.70	60.0	60.2	6.63	1000	clear ST	
3	1450	6.62	8199	7.22	8.24	69.1	43.5	7.03	1000	clear	
4	1500	6.43	8217	7.22	8.18	74.7	43.2	7.41	1000	clear	
5	1505	6.87	8155	7.21	8.22	75.5	26.4	7.72	500	clear	
6											
7	0805	Purged line for sampling.							5.60		
8	0810	5.74	8308	7.24	8.83	219.5	13.5	-	-	clear	
9											
10											

Stabilized: Yes  No

Total Volume Removed: 4000 mL

Comments: \* Purge April 17



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 103  
Sampling Personal: *Darren N. Ismaag*

Weather Conditions: Temp: *76* °F Wind: *SS* Precip: Sunny Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	Yes	No	<i>Not Visible</i>
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	<i>10.70</i>		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	<i>16.92</i>		ft
Water Level After Sample:	—		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<i>5</i> sec.
Dedicated Equip?:	Yes	<input checked="" type="checkbox"/> No	Recover:	<i>55</i> sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	—
Duplicate Sample ID:	<i>—</i>		Pumping Rate:	<i>100</i> mL/min
Purge Date:	<i>5 Apr 17</i>	Time Purging Began:	<i>0942</i>	<i>am</i> /pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	— am/pm
Sample Date:	<i>5 Apr 17</i>	Time of Sampling:	<i>1103</i>	<i>am</i> /pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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.
SEQ #	Time								clear, slightly turbid, turbid
1	<i>0947</i>	<i>7.45</i>	<i>2915</i>	<i>7.50</i>	<i>0.93</i>	<i>31.8</i>	<i>10.72</i>	<i>500</i>	<i>slightly turbid (ST)</i>
2	<i>1007</i>	<i>7.87</i>	<i>1592</i>	<i>7.40</i>	<i>0.40</i>	<i>124.3</i>	<i>10.72</i>	<i>2000</i>	<i>ST</i>
3	<i>1027</i>	<i>8.21</i>	<i>1556</i>	<i>7.56</i>	<i>0.37</i>	<i>143.4</i>	<i>10.72</i>	<i>2000</i>	<i>clear</i>
4	<i>1037</i>	<i>8.42</i>	<i>1528</i>	<i>7.60</i>	<i>0.31</i>	<i>122.1</i>	<i>10.72</i>	<i>1000</i>	<i>clear</i>
5	<i>1043</i>	<i>8.47</i>	<i>1525</i>	<i>7.73</i>	<i>0.30</i>	<i>113.0</i>	<i>10.72</i>	<i>500</i>	<i>clear</i>
6	<i>1047</i>	<i>8.55</i>	<i>1524</i>	<i>7.78</i>	<i>0.29</i>	<i>104.7</i>	<i>10.72</i>	<i>500</i>	<i>clear</i>
7	<i>1053</i>	<i>8.55</i>	<i>1522</i>	<i>7.86</i>	<i>0.29</i>	<i>81.4</i>	<i>10.72</i>	<i>500</i>	<i>clear</i>
8	<i>1057</i>	<i>8.60</i>	<i>1519</i>	<i>7.92</i>	<i>0.30</i>	<i>77.3</i>	<i>10.72</i>	<i>500</i>	<i>clear</i>
9	<i>1103</i>	<i>8.58</i>	<i>1519</i>	<i>7.94</i>	<i>0.27</i>	<i>74.1</i>	<i>10.72</i>	<i>500</i>	<i>clear</i>
10									

Stabilized:  Yes  No  
Comments:

Total Volume Removed: *8000* mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 109  
Sampling Personal: Darren N. Gray

Weather Conditions: Temp: 26 °F Wind: Light Precip: Sunny / Partly Cloudy (Cloudy)

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	*43.2 10.13 ft		
Total Well Depth:	ft		
Well Volume:	liters		
Depth to Top of Pump:	13.20 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	Recover:	55 sec.
Duplicate Sample?:	Yes	PSI:	-
Duplicate Sample ID:	Pumping Rate: 100 mL/min		
Purge Date:	5 April 17	Time Purging Began:	0750 am/pm
Well Purged Dry?:	Yes	Time Purged Dry:	am/pm
Sample Date:	5 April 17	Time of Sampling:	0840 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	0815		6.11	1660	7.41	0.38	153.5	7.82	10.65	2000	clear
3	0825		6.08	1666	7.48	0.35	140.0	2.28	10.68	1000	clear
4	0830		6.34	1663	7.50	0.35	136.3	0.94	10.68	500	clear
5	0835		6.19	1662	7.53	0.35	128.5	0.85	10.68	500	clear
6	0840		6.14	1668	7.55	0.35	122.4	0.88	10.68	500	clear
7											
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 5000 mL

Comments:

\* MW 5 April 17



# MVTL Calibration Worksheet

Site: MUCLC

Technician: Parren Niesman

Date: <u>5 April 17</u>	Time: <u>0650</u>						
Instrument (Circle One):	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7	<u>20.30</u>	<u>7.04</u>	<u>7.00</u>	6.95-7.05	<u>-17.5</u>	0 +/- 50
#2 650 MDS 04H14736	Buffer 10	<u>20.15</u>	<u>10.03</u>	<u>10.00</u>	9.95-10.05	<u>-192.2</u>	-180 +/- 50
#3 556 MPS 12E102056	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
Other:	Buffer 1413	<u>20.46</u>	<u>14.21</u>	<u>14.0</u>	1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C	<u>20.03</u>	<u>229.3</u>	<u>231.0</u>	±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
		<u>23.82</u>	<u>6.73</u>	<u>7.89</u>	mg/L	<u>711.8</u>	

Date:	Time:						
Instrument (Circle One):	<b>pH</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
	Buffer 7				6.95-7.05		0 +/- 50
#2 650 MDS 04H14736	Buffer 10				9.95-10.05		-180 +/- 50
#3 556 MPS 12E102056	<b>Conductivity</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
Other:	Buffer 1413				1387-1426		
Comments:	<b>ORP</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range		
	231 mV @ 25C				±10 mV		
	<b>DO</b>	Temp °C	Pre Cal	Post Cal	Post Cal Range	Barometric Pressure (mm Hg)	
					mg/L		



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	3 April 17	1401	9.21	
MW105	3 April 17	1414	8.95	
MW106	3 April 17	1412	9.61	
MW107	3 April 17	1403	4.35	
MW108	3 April 17	1410	16.95	
MW116	3 April 17	1406	9.92	



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Phone: (701) 258-9720

# Field Datasheet

## Water Level

Sampling Personnel:

Parren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	5 April 17	0851	0.45	
West Scrubber Pond Gauge	5 April 17	0850	0.60	
Stream behind Sewage Lagoon	5 April 17	1205	0.35	



**Laboratories, Inc.**

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

# Chain of Custody Record

Project Name: <b>MDU Lewis and Clark</b>		Event: <b>April 2017</b>	Work Order Number: <b>82-0810</b>
Report To: <b>MDU</b> Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	Carbon Copy: Attn: Address:		Name of Sampler(s): <i>Darren Niesmaas</i>

Lab Number	Sample ID	Sample Information			Bottle Type				Field Parameters			Analysis Required	
		Date	Time	Sample Type	1 liter Nitric					Temp (°C)	Spec. Cond.		pH
W821	MW110	3 April 17	1653	GW	4					6.95	1103	7.43	Rad 226 & Rad 228
W822	MW119	3 April 17	1840	GW	4					6.89	1197	7.46	
W823	MW210	4 April 17	1855	GW	4					8.62	1429	7.65	
W824	MW102	4 April 17	1320	GW	4					8.71	6892	7.07	
W825	MW118	4 April 17	1725	GW	4					6.13	1618	7.64	
W826	MW111	4 April 17	1518	GW	4					6.64	3169	7.37	
W827	MW117	4 April 17	0810	GW	4					5.74	8308	7.24	
W828	MW103	5 April 17	1103	GW	4					8.58	1519	7.94	
W829	MW109	5 April 17	0840	GW	4					6.14	1668	7.55	
W830	Dup 1	4 April 17	NA	GW	4					NA	NA	NA	
W831	Field Blank (FB)	5 April 17	NA	W	4					NA	NA	NA	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Niesmaas</i>	5 April 17 1665	<del>Log In</del> Walk In #2	TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>C. Campbell</i>	5 April 17 1615 Ambient



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June 28, 2017

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

RE: Groundwater Sampling Event - 2017 at MDU Lewis & Clark Site

Dear Ms. Marshall:

It was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the corrected Field Data Report.

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

Sincerely,

Jeremy Meyer  
MVTL Field Services



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Lewis and Clark**  
CCR Sampling

Attn: Samantha Marshall  
400 North 4th St  
Bismarck, ND 58501

WO# 82-1733  
82-1734

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	WATER LEVEL END (FT)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE
									TEMP (°C)	EC	pH	Turb. NTU	
MW110	26-Jun-17	11:14	26-Jun-17	14:44	9.33	9.42	21000.0	Bladder	14.50	1112	7.34	4.42*	clear
MW119	26-Jun-17	16:50	26-Jun-17	17:35	9.19	9.20	4500.0*	Bladder	14.25	1173	7.38	1.80	clear
MW210	26-Jun-17	18:40	26-Jun-17	19:35	9.40	11.48	5500.0	Bladder	14.05	1438	7.61	4.61	clear
MW102	27-Jun-17	7:41	27-Jun-17	9:46	19.28	19.68	12500.0	Bladder	12.61	6720	6.99	4.47	clear
MW118	27-Jun-17	14:00	27-Jun-17	15:10	8.78	8.90	7000.0*	Bladder	20.55	1698	7.41	4.96	clear
MW111	27-Jun-17	11:00	27-Jun-17	12:55	8.34	8.36	5500.0	Bladder	15.43	3691	7.24	2.37	clear
MW117	26-Jul-17	15:49	27-Jul-17	9:55	6.76	top of pump	6000.0	Bladder	13.88	8501	7.10	16.10	clear
MW103	28-Jun-17	7:45	28-Jun-17	8:50	10.77	10.79*	6500.0	Bladder	12.44	1573	7.42	3.52	clear
MW109	27-Jun-17	16:15	27-Jun-17	16:50	10.89	NR	3500.0	Bladder	17.35	1708	7.29	1.93	clear
MW101	NA	NA	28-Jun-17	9:56	9.31	NA	NA	WL	NA	NA	NA	NA	Water Level
MW105	NA	NA	28-Jun-17	10:07	9.09	NA	NA	WL	NA	NA	NA	NA	Water Level
MW106	NA	NA	28-Jun-17	10:06	9.89	NA	NA	WL	NA	NA	NA	NA	Water Level
MW107	NA	NA	28-Jun-17	9:58	4.64	NA	NA	WL	NA	NA	NA	NA	Water Level
MW108	NA	NA	28-Jun-17	10:04	16.51	NA	NA	WL	NA	NA	NA	NA	Water Level
MW116	NA	NA	28-Jun-17	10:11	10.57	NA	NA	WL	NA	NA	NA	NA	Water Level
NR= Not Recorded NA = Not Applicable													
*ammended due to typing or calculation error													



CASE NARRATIVE – AMENDED 7 AUG 2017 (Reporting)

MVTL Lab Reference No/SDG: 201782-1733
Client: Montana Dakota Utilities
Location: MDU Lewis & Clark
Project Identification: CCR Groundwater – June 2017 Event
MVTL Laboratory Identifications: 17-W2575 through 17-W2585
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include MW110, MW119, MW210, MW102, MW118, MW111, MW117, MW103, MW109, Dup 1, and Field Blank (FB).

I. RECEIPT

- All samples were received at the laboratory on 28 Jun 2017 at 1443.
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 0.9°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.



**CASE NARRATIVE – AMENDED 7 AUG 2017 (Reporting)**

**MVTL Lab Reference No/SDG:** 201782-1733  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – June 2017 Event  
**MVTL Laboratory Identifications:** 17-W2575 through 17-W2585  
**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 metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.

**V. REPORTING**

- 7 Aug 2017: Per email from Terri Olson with Barr Engineering, the data package was amended to correct errors on the field data report.

All laboratory data has been approved by MVTL Laboratories.

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



## Claudette Carroll

---

**From:** Terri A. Olson <TOlson@barr.com>  
**Sent:** Friday, July 28, 2017 8:35 AM  
**To:** Claudette Carroll  
**Cc:** Justin Soberaski; Barr Data Management  
**Subject:** RE: Emailing - 201782-1733 MDU L&C CCR JUN 17.pdf

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

Hi Claudette,

Reviewed the NDDH report for 201782-1733 and noted the following:

- The dissolved Li MSD was 128% but this wasn't included in the case narrative of the report.
- Field Data Report items:
  - MW110 – turbidity recorded as 4.57 but raw data lists 4.42.
  - MW119 – volume removed recorded as 4000.0 but raw data adds up to 4500.
  - MW118 – volume removed recorded as 8000.0 but raw data adds up to 7000.
  - MW117 – purge date recorded as 06/27 but raw data lists 06/26.
  - MW117 – time of sample recorded as 10:55 but raw data lists 09:55.
  - MW103 – water level end recorded as 17.15 but raw data lists 10.79.

Please let me know if you have any questions.

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>]  
**Sent:** Thursday, July 13, 2017 10:49 AM  
**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)>; Justin Soberaski <[JSoberaski@barr.com](mailto:JSoberaski@barr.com)>  
**Subject:** Emailing - 201782-1733 MDU L&C CCR JUN 17.pdf

Hello all,

Attached is the data package for the Jun 2017 CCR sampling done at MDU Lewis & Clark. Hard copies and EDDs to follow.

Regards,  
Claudette



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Laboratories, Inc.**

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[ccarroll@mvtl.com](mailto:ccarroll@mvtl.com)

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MEMBER  
ACIL

## Quality Control Report

Lab IDs: 17-W2575 to 17-W2585

Project: MDU Lewis & Clark - CCR

Work Order: 201782-1733

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	100	80-120	0.400 0.400	17W2578q 17W2584q	< 0.001 0.0046	0.4318 0.4228	108 105	75-125 75-125	0.4318 0.4228	0.4218 0.4248	105 105	2.3 0.5	20 20	- -	- -	< 0.001
Arsenic - Total mg/l	0.1000	100	80-120	0.400 0.400	17W2578q 17W2584q	0.0024 0.0025	0.4400 0.4272	109 106	75-125 75-125	0.4400 0.4272	0.4324 0.4150	108 103	1.7 2.9	20 20	- -	- -	< 0.002
Barium - Total mg/l	0.1000	95	80-120	0.400 0.400	17W2578q 17W2584q	0.0160 0.0219	0.4128 0.4190	99 99	75-125 75-125	0.4128 0.4190	0.4146 0.4106	100 97	0.4 2.0	20 20	- -	- -	< 0.002
Beryllium - Total mg/l	0.1000	107	80-120	0.400 0.400	17W2578q 17W2584q	< 0.0005 < 0.0005	0.4418 0.4308	110 108	75-125 75-125	0.4418 0.4308	0.4400 0.4176	110 104	0.4 3.1	20 20	- -	- -	< 0.0005
Boron - Total mg/l	0.40	100	80-120	6.00 0.400	17-W2578 17-W2584	24.2 1.69	29.7 2.05	92 90	75-125 75-125	29.7 2.05	30.1 2.07	98 95	1.3 1.0	20 20	- -	- -	< 0.1 < 0.1 < 0.1
Cadmium - Total mg/l	0.1000	105	80-120	0.400 0.400	17W2578q 17W2584q	< 0.0005 < 0.0005	0.4382 0.4284	110 107	75-125 75-125	0.4382 0.4284	0.4300 0.4418	108 110	1.9 3.1	20 20	- -	- -	< 0.0005
Calcium - Total mg/l	20.0 20.0	108 115	80-120 80-120	100 100 100 500	17W2562q 17W2571q 17-W2661 17-M1596	95.8 211 18.8 178	188 294 125 740	92 83 106 112	75-125 75-125 75-125 75-125	188 294 125 740	190 292 121 705	94 81 102 105	1.1 0.7 3.3 4.8	20 20 20 20	- - - -	- - - -	< 1 < 1 < 1 < 1
Chloride mg/l	30.0 30.0 30.0	87 87 88	80-120 80-120 80-120	30.0 30.0	17-D2180 17-W2583	37.5 21.4	67.5 49.1	100 92	80-120 80-120	67.5 49.1	66.7 49.1	97 92	1.2 0.0	20 20	- - - -	- - - -	< 1 < 1 < 1 < 1
Chromium - Total mg/l	0.1000	98	80-120	0.400 0.400	17W2578q 17W2584q	< 0.002 < 0.002	0.4048 0.3830	101 96	75-125 75-125	0.4048 0.3830	0.3970 0.3792	99 95	1.9 1.0	20 20	- -	- -	< 0.002
Cobalt - Total mg/l	0.1000	96	80-120	0.400 0.400	17W2578q 17W2584q	0.0064 0.0024	0.4082 0.3820	100 95	75-125 75-125	0.4082 0.3820	0.3992 0.3842	98 95	2.2 0.6	20 20	- -	- -	< 0.002
Fluoride mg/l	0.50	106	90-110	0.500 0.500	17-W2576 17-W2584	0.46 0.84	1.01 1.32	110 96	80-120 80-120	1.01 1.32	1.02 1.35	112 102	1.0 2.2	20 20	- -	- -	< 0.1 < 0.1
Lead - Total mg/l	0.1000	99	80-120	0.400 0.400	17W2578q 17W2584q	< 0.0005 < 0.0005	0.3792 0.4048	95 101	75-125 75-125	0.3792 0.4048	0.3850 0.3958	96 99	1.5 2.2	20 20	- -	- -	< 0.0005

**Quality Control Report**

Lab IDs: 17-W2575 to 17-W2585

Project: MDU Lewis & Clark - CCR

Work Order: 201782-1733

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 0.400	17-W2578 17-W2584	0.25 0.07	0.71 0.49	115 105	75-125 75-125	0.71 0.49	0.70 0.48	112 102	1.4 2.1	20 20	- - - - -	- - - - -	< 0.1 < 0.1 < 0.1 < 0.1 < 0.1
Mercury - Total mg/l	0.0020	95	85-115	0.002 0.002 0.002	A2999 17-W2575 17-W2585	< 0.0002 < 0.0002 < 0.0002	0.0019 0.0018 0.0020	95 90 100	70-130 70-130 70-130	0.0019 0.0018 0.0020	0.0019 0.0018 0.0020	95 90 100	0.0 0.0 0.0	20 20 20	- - -	- - -	< 0.0002
Molybdenum - Total mg/l	0.1000	99	80-120	0.400 0.400	17W2578q 17W2584q	0.1074 0.0250	0.5306 0.4052	106 95	75-125 75-125	0.5306 0.4052	0.5222 0.4034	104 95	1.6 0.4	20 20	- -	- -	< 0.002
pH units	- -	- -	- -	- -	- -	- -	- -	- -	- -	7.7 8.2	7.8 8.2	- -	1.3 0.0	20 20	- -	- -	- -
Selenium - Total mg/l	0.1000	108	80-120	0.400 0.400	17W2578q 17W2584q	< 0.005 0.0718	0.4922 0.5376	123 116	75-125 75-125	0.4922 0.5376	0.4926 0.5298	123 114	0.1 1.5	20 20	- -	- -	< 0.002
Sulfate mg/l	100 100	118 101	80-120 80-120	500 100	17-W2568 17-W2585	196 < 5	733 106	107 106	80-120 80-120	733 106	740 95.0	109 95	1.0 10.9	20 20	- -	- -	< 5 < 5
Thallium - Total mg/l	0.1000	97	80-120	0.400 0.400	17W2578q 17W2584q	< 0.0005 < 0.0005	0.3786 0.3986	95 100	75-125 75-125	0.3786 0.3986	0.3764 0.3904	94 98	0.6 2.1	20 20	- -	- -	< 0.0005
Total Dissolved Solids mg/l	- -	- -	- -	- -	- -	- -	- -	- -	- -	1190 < 10	1160 < 10	- -	2.6 0.0	20 *	- -	- -	< 10

\* Due to result < 10 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 3 mg/L.

Approved by: C. Camp  
 13 JUL 17



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Page: 1 of 11

## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 10 Jul 17  
 Lab Number: 17-W2575  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 26 Jun 17 14:44  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW110

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34	units	NA	SM 4500 H+ B	26 Jun 17 14:44	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	14.5	Degrees C	NA	SM 2550B	26 Jun 17 14:44	DJN
Conductivity - Field	1112	umhos/cm	1	EPA 120.1	26 Jun 17 14:44	DJN
Fluoride	0.49	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	185	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	22.0	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	659	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	90.8	mg/l	1.0	6010	30 Jun 17 14:04	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	0.19	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0311	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0041	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll*

*CL  
13 JUL 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 sample quantity

# = Due to concentration of other analytes  
 + = 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 St  
 Bismarck ND 58501

Report Date: 10 Jul 17  
 Lab Number: 17-W2576  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 26 Jun 17 17:35  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW119

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.38	units	NA	SM 4500 H+ B	26 Jun 17 17:35	DJN
pH	* 7.4	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	14.2	Degrees C	NA	SM 2550B	26 Jun 17 17:35	DJN
Conductivity - Field	1173	umhos/cm	1	EPA 120.1	27 Jun 17 17:35	DJN
Fluoride	0.46	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	245	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	25.5	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	687	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	95.1	mg/l	1.0	6010	30 Jun 17 14:04	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	0.21	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0324	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0040	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

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

Approved by: Claudette K. Carroll <sup>CL</sup> 13 JUL 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 St  
 Bismarck ND 58501

Report Date: 10 Jul 17  
 Lab Number: 17-W2577  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 26 Jun 17 19:35  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW210

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.61	units	NA	SM 4500 H+ B	26 Jun 17 19:35	DJN
pH	* 7.7	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	14.0	Degrees C	NA	SM 2550B	26 Jun 17 19:35	DJN
Conductivity - Field	1438	umhos/cm	1	EPA 120.1	26 Jun 17 19:35	DJN
Fluoride	0.95	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	344	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	4.0	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	900	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	44.4	mg/l	1.0	6010	30 Jun 17 14:04	SZ
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	0.17	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0228	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0036	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

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

Approved by:

*Claudette K. Carroll* <sup>CL</sup> 13 JUL 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 St  
 Bismarck ND 58501

Report Date: 10 Jul 17  
 Lab Number: 17-W2579  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 27 Jun 17 15:10  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW118

PO #: 165273 OP

Event and Year: June 2017

Temp at Receipt: 0.9C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.41	units	NA	SM 4500 H+ B	27 Jun 17 15:10	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	20.6	Degrees C	NA	SM 2550B	27 Jun 17 15:10	DJN
Conductivity - Field	1698	umhos/cm	1	EPA 120.1	27 Jun 17 15:10	DJN
Fluoride	1.28	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	566	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	19.6	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	1160	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	88.6	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	1.66	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	0.0021	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0306	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0460	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	0.0756	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>K</sup> 13 JUL 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 St  
Bismarck ND 58501

Report Date: 10 Jul 17  
Lab Number: 17-W2580  
Work Order #: 82-1733  
Account #: 002800  
Date Sampled: 27 Jun 17 12:55  
Date Received: 28 Jun 17 14:43  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW111

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24	units	NA	SM 4500 H+ B	27 Jun 17 12:55	DJN
pH	* 7.5	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	15.4	Degrees C	NA	SM 2550B	27 Jun 17 12:55	DJN
Conductivity - Field	3691	umhos/cm	1	EPA 120.1	27 Jun 17 12:55	DJN
Fluoride	2.28	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	1940	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	34.9	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	3280	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	178	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	0.18	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	7.51	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0218	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0696	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	0.1015	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC  
13 JUL 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 sample quantity

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

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 10 Jul 17  
 Lab Number: 17-W2581  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 27 Jun 17 10:55  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW117

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.10	units	NA	SM 4500 H+ B	27 Jun 17 10:55	DJN
pH	* 7.5	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	13.9	Degrees C	NA	SM 2550B	27 Jun 17 10:55	DJN
Conductivity - Field	8501	umhos/cm	1	EPA 120.1	27 Jun 17 10:55	DJN
Fluoride	0.26	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	7300	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	46.6	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	8970	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	486	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	< 0.2 @	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	9.30	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0246	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0044	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	0.0363	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 13 JUL 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:

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

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 10 Jul 17  
 Lab Number: 17-W2582  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 28 Jun 17 8:50  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW103

PO #: 165273 OP

Event and Year: June 2017

Temp at Receipt: 0.9C

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.42	units	NA	SM 4500 H+ B	28 Jun 17 8:50	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	12.4	Degrees C	NA	SM 2550B	28 Jun 17 8:50	DJN
Conductivity - Field	1573	umhos/cm	1	EPA 120.1	28 Jun 17 8:50	DJN
Fluoride	0.85	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	437	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	21.7	mg/l	1.0	SM4500-Cl-E	7 Jul 17 10:31	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	1020	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	94.6	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	1.52	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	0.0047	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	0.0033	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0227	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0250	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	0.0559	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*cc  
13 Jul 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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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 10 Jul 17  
 Lab Number: 17-W2583  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 27 Jun 17 16:50  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW109

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.29	units	NA	SM 4500 H+ B	27 Jun 17 16:50	DJN
pH	* 7.6	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Temperature - Field	17.4	Degrees C	NA	SM 2550B	27 Jun 17 16:50	DJN
Conductivity - Field	1708	umhos/cm	1	EPA 120.1	27 Jun 17 16:50	DJN
Fluoride	0.84	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	541	mg/l	5.00	ASTM D516-07	6 Jul 17 14:27	EMS
Chloride	21.4	mg/l	1.0	SM4500-Cl-E	7 Jul 17 11:30	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	1160	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	113	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	1.69	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	0.0045	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	0.0029	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	0.0214	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	0.0024	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	0.0246	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	0.0676	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>cc</sup> 13 JUL 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



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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 10 Jul 17  
 Lab Number: 17-W2585  
 Work Order #: 82-1733  
 Account #: 002800  
 Date Sampled: 28 Jun 17  
 Date Received: 28 Jun 17 14:43  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: Field Blank (FB)

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH	* 6.0	units	0.1	SM4500 H+ B	29 Jun 17 17:00	CS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	29 Jun 17 17:00	CS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	6 Jul 17 14:50	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	7 Jul 17 11:30	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	7 Jul 17 11:04	EV
Total Dissolved Solids	< 10	mg/l	10	I1750-85	29 Jun 17 13:50	SVS
Calcium - Total	< 1	mg/l	1.0	6010	7 Jul 17 11:31	KMD
Lithium - Total	< 0.1	mg/l	0.10	6010	6 Jul 17 12:27	KMD
Boron - Total	< 0.1	mg/l	0.10	6010	5 Jul 17 13:10	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	5 Jul 17 16:20	KMD
Arsenic - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Barium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cobalt - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Selenium - Total	< 0.005 ^	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Thallium - Total	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD

\* Holding time exceeded

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

Approved by: Claudette K. Carroll *CC* *13 JUL 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 Lewis and Clark

Technician: Darren Nieswag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

**Pre Site Calibration**

Date: 26 June 17 Time: 0640

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
pH Buffer 7	<u>19.74</u>	<u>7.02</u>	<u>7.00</u>	6.95-7.05	<u>-13.5</u>	0 +/- 50
Buffer 10	<u>19.83</u>	<u>10.08</u>	<u>10.00</u>	9.95-10.05	<u>-190.6</u>	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 1413	<u>19.87</u>	<u>1432</u>	<u>1414</u>	±10%	Buffer 5000	<u>4982</u>
<b>ORP</b>						
231 mV @ 25C	<u>19.71</u>	<u>232.7</u>	<u>231.0</u>	±10 mV		
<b>DO</b>						
	<u>20.05</u>	<u>8.45</u>	<u>8.65</u>	Barometric Pressure (mm Hg)		
				mg/L	<u>718.7</u>	

**Pre Site Calibration**

Date: 27 June 17 Time: 0640

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
pH Buffer 7	<u>22.08</u>	<u>7.02</u>	<u>7.00</u>	6.95-7.05	<u>-14.9</u>	0 +/- 50
Buffer 10	<u>22.02</u>	<u>9.95</u>	<u>9.94</u>	9.95-10.05	<u>-190.1</u>	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 1413	<u>22.03</u>	<u>1405</u>	<u>1413</u>	±10%	Buffer 5000	<u>4998</u>
<b>ORP</b>						
231 mV @ 25C	<u>22.09</u>	<u>226.1</u>	<u>231.0</u>	±10 mV		
<b>DO</b>						
	<u>21.15</u>	<u>8.33</u>	<u>8.57</u>	Barometric Pressure (mm Hg)		
				mg/L	<u>700.0</u>	

**Post Site Check**

Time: 0815 2015

	Temp °C	Reading
pH Buffer 7	<u>23.44</u>	<u>7.03</u>
<b>Conductivity</b>		
Buffer 1413	<u>23.58</u>	<u>1408</u>

**Post Site Check**

Time: 1727

	Temp °C	Reading
pH Buffer 7	<u>30.07</u>	<u>6.99</u>
<b>Conductivity</b>		
Buffer 1413	<u>30.05</u>	<u>1405</u>



# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Meyer

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS-12E102056

**Pre Site Calibration**

Date: 28 June 17 Time: 0700

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
<b>pH</b>						
Buffer 7	<u>22.13</u>	<u>6.99</u>	<u>7.00</u>	6.95-7.05	<u>-14.0</u>	0 +/- 50
Buffer 10	<u>22.13</u>	<u>10.02</u>	<u>10.00</u>	9.95-10.05	<u>-190.2</u>	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 1413	<u>21.98</u>	<u>1389</u>	<u>1413</u>	±10%	Buffer 5000	<u>5015</u>
<b>ORP</b>	<u>21.88</u>	<u>2365</u>	<u>231.0</u>			
231 mV @ 25C	<del><u>22.13</u></del>	<del><u>10.02</u></del>	<del><u>10.00</u></del>	±10 mV		
<b>DO</b>						
	<u>21.44</u>	<u>7.36</u>	<u>8.17</u>	Barometric Pressure (mm Hg)	<u>702.6</u>	
				mg/L		

**Post Site Check**

Time: 0855

	Temp °C	Reading
<b>pH</b>		
Buffer 7	<u>19.92</u>	<u>7.04</u>
<b>Conductivity</b>		
Buffer 1413	<u>20.02</u>	<u>1419</u>

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 1413				±10%	Buffer 5000	
<b>ORP</b>						
231 mV @ 25C				±10 mV		
<b>DO</b>						
				Barometric Pressure (mm Hg)		
				mg/L		

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

	Temp °C	Reading
<b>pH</b>		
Buffer 7		
<b>Conductivity</b>		
Buffer 1413		



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW110  
Sampling Personal: *Parren N. Gray*

Weather Conditions: Temp: 76 °F Wind: S 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:	9.33	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	14.38	ft
Water Level After Sample:	7.42	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input type="checkbox"/>	No <input checked="" 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:	26 Jun 17	Time Purging Began:	11:14	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	
Sample Date:	26 Jun 17	Time of Sampling:	14:44	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1119	14.63	1114	7.33	2.69	158.3	71000	9.39	500	Turbid, Tan
2	1139	14.54	1114	7.35	2.82	174.9	272	9.39	2000	Slightly Turbid
3	1159	14.31	1109	7.34	3.08	190.1	155	9.39	2000	ST
4	1229	14.34	1107	7.28	3.00	204.3	57.8	9.39	3000	ST
5	1259	14.57	1106	7.36	3.13	209.8	28.7	9.42	3000	ST
6	1329	14.43	1107	7.35	3.21	215.8	16.4	9.40	3000	Clear
7	1359	14.41	1107	7.36	3.23	222.6	9.48	9.42	3000	clear
8	1419	14.64	1110	7.35	3.25	224.2	8.15	9.42	2000	clear
9	1424	14.68	1111	7.35	3.21	225.3	6.18	9.42	500	clear
10	1429	14.85	1109	7.36	3.25	225.9	4.97	9.42	500	clear

Stabilized: Yes  No

Total Volume Removed:          mL

Comments:

*Next page*

*When lowering the pump there is a catch in the well. I think the PVC is coming apart a little more down.*



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark

Event: 2017

Sample ID: MW110

Sampling Personal: Darren Niesman

Date: 26 Jun 17

### 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									
12	1434	14.73	1110	7.34	3.27	226.7	4.57	9.42	500	clear
13	1439	14.56	1110	7.33	3.29	228.8	4.48	9.42	500	clear
14	1449	14.50	1112	7.34	3.29	229.7	4.42	9.42	500	clear
15							0			
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: Yes No

Total Volume Removed: 21,000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: mwl19  
Sampling Personal: Darren Nieswary

Weather Conditions: Temp: 85 °F Wind: 510 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:	9.19	ft	
Total Well Depth:	—	ft	
Well Volume:	—	liters	
Depth to Top of Pump:	13.20	ft	
Water Level After Sample:	9.20	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"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI:	—
Duplicate Sample ID:	—	Pumping Rate:	100 mL/min
Purge Date:	26 Jun 17	Time Purging Began:	1650 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	26 Jun 17	Time of Sampling:	1735 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1655	14.27	1172	7.34	1.05	250.2	13.1	9.21	500	clear
2	1710	14.17	1170	7.38	1.02	2159.3	5.06	9.19	1500	clear
3	1715	14.30	1172	7.37	1.06	134.5	3.64	9.20	500	clear
4	1720	14.01	1172	7.38	1.14	122.8	2.17	9.20	500	clear
5	1725	14.26	1171	7.37	1.18	104.8	1.92	9.20	500	clear
6	1730	14.12	1172	7.37	1.20	101.9	1.83	9.20	500	clear
7	1735	14.25	1173	7.38	1.23	99.7	1.80	9.20	500	clear
8										
9										
10										

Stabilized: Yes  No   
Comments: \_\_\_\_\_

Total Volume Removed: 4000 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: MW210  
 Sampling Personal: Darrin Niesing

Weather Conditions: Temp: 83 °F Wind: S11 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:	9.40		ft
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	30.82		ft
Water Level After Sample:	11.48		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:	-
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	26 Jun 17	Time Purging Began:	1840	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	26 Jun 17	Time of Sampling:	1935	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter Nitric		

### Field Measurements

SEQ #	Time	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	1845	13.48	1438	7.58	1.32	-32.1	199	10.29	500	slightly turbid
2	1900	13.77	1438	7.61	0.46	-89.6	48.6	11.21	1500	ST
3	1915	13.98	1439	7.61	0.30	-103.3	17.4	11.36	1500	clear
4	1920	13.49	1440	7.61	0.25	-106.3	9.23	11.38	500	clear
5	1925	14.04	1436	7.61	0.28	-108.3	4.92	11.38	500	clear
6	1930	13.96	1436	7.60	0.28	-108.8	4.73	11.28	500	clear
7	1935	14.05	1438	7.61	0.29	-109.3	4.61	11.46	500	clear
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 5500 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: AW-210-MW102  
Sampling Personal: Darren Nicewy

Weather Conditions: Temp: 64 °F Wind: 5/11 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?	<u>Yes</u>	No	<u>Not Visible</u>
Repairs Necessary:	<u>—</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>19.28</u>	ft	
Total Well Depth:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>21.90</u>	ft	
Water Level After Sample:	<u>19.68</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?:	Yes <u>No</u>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes <u>No</u>	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>	Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>27 June 17</u>	Time Purging Began:	<u>0741</u> am/pm
Well Purged Dry?	Yes <u>No</u>	Time Purged Dry:	<u>—</u> am/pm
Sample Date:	<u>27 June 17</u>	Time of Sampling:	<u>0946</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	0816		11.49	6659	6.98	0.44	2.2	35.2	19.68	3000	ST
3	0846		12.09	6700	6.97	0.24	-4.0	14.0	19.68	3000	clear
4	0916		12.00	6739	6.98	0.16	-10.4	9.74	19.64	3000	clear
5	0931		12.19	6732	6.99	0.17	-11.9	5.98	19.68	1500	clear
6	0936		12.17	6767	6.98	0.17	-12.2	4.77	19.68	500	clear
7	0941		12.36	6744	6.98	0.16	-12.7	4.56	19.68	500	clear
8	0946		12.61	6720	6.99	0.16	-12.9	4.47	19.68	500	clear
9											
10											

Stabilized: (Yes) No

Total Volume Removed: 12500 mL

Comments:





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 111  
Sampling Personal: Darren Nieswag

Weather Conditions: Temp: 80 °F Wind: S13 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:	8.34	ft	
Total Well Depth:	ft		
Well Volume:	liters		
Depth to Top of Pump:	13.35	ft	
Water Level After Sample:	8.36	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"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI:	
Duplicate Sample ID:	Pumping Rate: 100 mL/min		
Purge Date:	27 June 17	Time Purging Began:	1100 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry:	am/pm
Sample Date:	27 June 17	Time of Sampling:	1255 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1205	16.07	3990	6.98	257.7	253.6	45.5	8.38	500	Slightly Turbid
2	1215	16.55	3727	6.715	210.57	249.0	22.5	8.36	1000	ST
3	1235	15.75	3693	7.22	2.14	254.8	7.21	8.36	2000	Clear
4	1240	15.50	3103	7.22	2.25	256.9	3.89	8.36	500	Clear
5	1245	15.50	3694	7.24	2.29	258.2	2.16	8.36	500	Clear
6	1250	15.61	3701	7.23	2.30	261.5	2.34	8.36	500	Clear
7	1255	15.43	3691	7.24	2.34	262.3	2.37	8.36	500	Clear
8										
9										
10										

DO 2.03

Stabilized: Yes No  
Comments:

Total Volume Removed: 5500 mL





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: ny117  
Sampling Personal: Darren Wiseman

Weather Conditions: Temp: 63 °F Wind: S13 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:	6.76		ft
Total Well Depth:			ft
Well Volume:			liters
Depth to Top of Pump:	9.85		ft
Water Level After Sample:	Top of Pump		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	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	26 Jul 17		Time Purging Began:	1549 am/pm
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Time Purged Dry:	1644 am/pm
Sample Date:	22 Jun 17		Time of Sampling:	0955 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	1554	15.32	8384	7.00	6.57	233.1	29.0	6.04 500	clear slightly turbid
2	1504	15.67	8356	7.03	5.79	249.5	28.7	7.36 1000	st
3	1614	14.93	8199	7.07	7.07	269.0	17.1	7.74 1000	clear
4	1629	14.90	8215	7.06	6.53	279.3	10.3	8.62 1500	clear
5	1644	14.33	8246	7.07	5.62	283.0	8.61	9.85 1500	clear
6									
7									
8	0950	Purged line for 5min before sample		7.82					
9	0955	13.88	8501	7.10	6.09	238.6	16.1	8.14 500	clear
10									

Stabilized: Yes  No

Total Volume Removed: 6000 mL

Comments:

There wasn't enough water in well to get stabilization.



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW103  
Sampling Personal: Jarrod Niskay

Weather Conditions: Temp: 62 °F Wind: Light 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>10.77</u>	ft	
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	<u>17.15</u>	ft	
Water Level After Sample:	<u>10.79</u>	ft	
Measurement Method:	<u>Electric Water Level Indicator</u>		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<u>5</u> sec.
Dedicated Equip?:	Yes	<u>No</u>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	
Duplicate Sample ID:	—		Pumping Rate: <u>100</u> mL/min	
Purge Date:	<u>28 June 17</u>	Time Purging Began:	<u>0745</u>	<u>am</u> /pm
Well Purged Dry?	Yes	<u>No</u>	Time Purged Dry:	— am/pm
Sample Date:	<u>28 June 17</u>	Time of Sampling:	<u>0850</u>	<u>am</u> /pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	0750	12.42	8088	7.22	553	259.7	446	10.79	500	Turbid grey
2	0820	12.28	1593	7.43	210	241.5	42.0	10.79	1500	slightly turbid
3	0830	12.30	1594	7.43	0.31	242.5	13.1	10.79	1000	clear
4	0840	12.46	1569	7.42	0.32	241.6	3.83	10.79	1000	CG
5	0845	12.39	1572	7.42	0.37	241.9	3.28	10.29	500	ch
6	0850	12.44	1573	7.42	0.30	241.7	3.52	10.29	500	ch
7										
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 6500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: May 10 9  
Sampling Personal: Parren N. [Signature]

Weather Conditions: Temp: 84 °F Wind: NW 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:	<u>—</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>10.89</u>	ft	
Total Well Depth:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>13.92</u>	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?:	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>—</u>
Duplicate Sample ID:	<u>Dup-1</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>27 June 17</u>	Time Purging Began:	<u>1615</u>	<u>am/pm</u>
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	<u>—</u> <u>am/pm</u>
Sample Date:	<u>27 June 17</u>	Time of Sampling:	<u>1650</u>	<u>am/pm</u>
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter Nitric		

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1620	19.22	1794	7.25	1.98	228.5	32.5	10.84	500	slightly turbid
2	1630	17.46	1709	7.28	0.23	222.6	7.64	10.84	1000	clear
3	1635	17.29	1704	7.28	0.24	222.3	3.28	10.84	500	clear
4	1640	17.43	1703	7.28	0.22	221.9	2.06	10.84	500	clear
5	1645	17.44	1709	7.29	0.20	221.0	1.90	10.84	500	clear
6	1650	17.35	1708	7.29	0.19	220.4	1.93	10.84	500	clear
7	<u>f</u>									
8										
9										
10										

Stabilized: Yes No  
Comments: (Signature)

Total Volume Removed: 3500 mL



# Laboratories, Inc.

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

# Chain of Custody Record

<b>Project Name:</b> MDU Lewis and Clark	<b>Event:</b> June 2017	<b>Work Order Number:</b> 82-1733
<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 Nieswaag

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	
W2575	MW110	26 June 17	1444	GW	X	X	X	14.50	1112	7.34	MDU CCR
W2576	MW119	26 June 17	1735	GW	X	X	X	14.25	1173	7.38	
W2577	MW210	26 June 17	1935	GW	X	X	X	14.05	1438	7.61	
W2578	MW102	27 June 17	0946	GW	X	X	X	12.61	6720	6.99	
W2579	MW118	27 June 17	1510	GW	X	X	X	20.55	1698	7.41	
W2580	MW111	27 June 17	1255	GW	X	X	X	15.43	3691	7.24	
W2581	MW117	27 June 17	<del>0855</del> 1755	GW	X	X	X	13.88	8501	7.10	
W2582	MW103	28 June 17	0850	GW	X	X	X	12.44	1573	7.42	
W2583	MW109	27 June 17	1650	GW	X	X	X	17.35	1708	7.29	
W2584	Dup 1	27 June 17	NA	GW	X	X	X	NA	NA	NA	
W2585	Field Blank (FB)	28 June 17	NA	W	X	X	X	NA	NA	NA	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswaag</i>	28 June 17 1443	Log In Walk In #2	0.9 TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>Darren Nieswaag</i>	28 June 2017 1443



**CASE NARRATIVE**

**MVTL Lab Reference No/SDG:** 201782-1734  
**IML Lab Reference No/SDG:** S1707004  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** CCR Groundwater – June 2017 Event  
**MVTL Laboratory Identifications:** 17-W2586 through 17-W2596  
**IM Laboratory Identifications:** S1707004-001 through S1707004-011  
**Page 1 of 2**

MDU Sample Identification	IML Sample Identification	MVTL Laboratory #
MW110	S1707004-001	17-W2586
MW119	S1707004-002	17-W2587
MW210	S1707004-003	17-W2588
MW102	S1707004-004	17-W2589
MW118	S1707004-005	17-W2590
MW111	S1707004-006	17-W2591
MW117	S1707004-007	17-W2592
MW103	S1707004-008	17-W2593
MW109	S1707004-009	17-W2594
Dup 1	S1707004-010	17-W2595
Field Blank (FB)	S1707004-011	17-W2596

**I. RECEIPT**

- All samples were received at the laboratory on 28 Jun 17 at 1443.
- 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 0.9°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 3 July 17.
  - 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.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-1734  
IML Lab Reference No/SDG: S1707004  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: CCR Groundwater – June 2017 Event  
MVTL Laboratory Identifications: 17-W2586 through 17-W2596  
IM Laboratory Identifications: S1707004-001 through S1707004-011  
Page 2 of 2

III. METHODS

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

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 28 JUL 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

Report Date: 21 Aug 17  
Lab Number: 17-W2586  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 26 Jun 17 14:44  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW110

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.34	units	NA	SM 4500 H+ B	26 Jun 17 14:44	DJN
Temperature - Field	14.5	Degrees C	NA	SM 2550B	26 Jun 17 14:44	DJN
Conductivity - Field	1112	umhos/cm	1	EPA 120.1	26 Jun 17 14:44	DJN
Radium 226	See Attached Report				3 Aug 17	OL
Radium 228	See Attached Report				29 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*CC*  
*28 Aug 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 St  
 Bismarck ND 58501

Report Date: 21 Aug 17  
 Lab Number: 17-W2587  
 Work Order #: 82-1734  
 Account #: 002800  
 Date Sampled: 26 Jun 17 17:35  
 Date Received: 28 Jun 17 14:43  
 Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW119

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.38	units	NA	SM 4500 H+ B	26 Jun 17 17:35	DJN
Temperature - Field	14.2	Degrees C	NA	SM 2550B	26 Jun 17 17:35	DJN
Conductivity - Field	1173	umhos/cm	1	EPA 120.1	26 Jun 17 17:35	DJN
Radium 226	See Attached Report				3 Aug 17	OL
Radium 228	See Attached Report				29 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>lc</sup> 28 Aug 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 St  
Bismarck ND 58501

Report Date: 21 Aug 17  
Lab Number: 17-W2588  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 26 Jun 17 19:35  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW210

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.61	units	NA	SM 4500 H+ B	26 Jun 17 19:35	DJN
Temperature - Field	14.0	Degrees C	NA	SM 2550B	26 Jun 17 19:35	DJN
Conductivity - Field	1438	umhos/cm	1	EPA 120.1	26 Jun 17 19:35	DJN
Radium 226	See Attached Report				3 Aug 17	OL
Radium 228	See Attached Report				29 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

Claudette K. Carroll

LC  
28 Aug 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 St  
Bismarck ND 58501

Report Date: 21 Aug 17  
Lab Number: 17-W2589  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 27 Jun 17 9:46  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW102

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.99 units	NA	SM 4500 H+ B	27 Jun 17 9:46	DJN
Temperature - Field	12.6 Degrees C	NA	SM 2550B	27 Jun 17 9:46	DJN
Conductivity - Field	6720 umhos/cm	1	EPA 120.1	27 Jun 17 9:46	DJN
Radium 226	See Attached Report			3 Aug 17	OL
Radium 228	See Attached Report			29 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>cc</sup> 28 Aug 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 guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.



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Page: 1 of 1

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

Report Date: 21 Aug 17  
Lab Number: 17-W2590  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 27 Jun 17 15:10  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW118

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.41	units	NA	SM 4500 H+ B	27 Jun 17 15:10	DJN
Temperature - Field	20.6	Degrees C	NA	SM 2550B	27 Jun 17 15:10	DJN
Conductivity - Field	1698	umhos/cm	1	EPA 120.1	27 Jun 17 15:10	DJN
Radium 226	See Attached Report				3 Aug 17	OL
Radium 228	See Attached Report				30 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>cc</sup> 28 Aug 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 sample quantity
- # = Due to concentration of other analytes
- + = Due to internal standard response

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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

Report Date: 21 Aug 17  
Lab Number: 17-W2591  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 27 Jun 17 12:55  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW111

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.24 units	NA	SM 4500 H+ B	27 Jun 17 12:55	DJN
Temperature - Field	15.4 Degrees C	NA	SM 2550B	27 Jun 17 12:55	DJN
Conductivity - Field	3691 umhos/cm	1	EPA 120.1	27 Jun 17 12:55	DJN
Radium 226	See Attached Report			3 Aug 17	OL
Radium 228	See Attached Report			30 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*rc*  
*28 Aug 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 St  
Bismarck ND 58501

Report Date: 21 Aug 17  
Lab Number: 17-W2592  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 27 Jun 17 10:55  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW117

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.10 units	NA	SM 4500 H+ B	27 Jun 17 10:55	DJN
Temperature - Field	13.9 Degrees C	NA	SM 2550B	27 Jun 17 10:55	DJN
Conductivity - Field	8501 umhos/cm	1	EPA 120.1	27 Jun 17 10:55	DJN
Radium 226	See Attached Report			3 Aug 17	OL
Radium 228	See Attached Report			30 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by:

*Claudette K. Carroll*

*CC  
28 Aug 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 sample quantity

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

CERTIFICATION: ND # ND-00016



# MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Page: 1 of 1

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

Report Date: 21 Aug 17  
Lab Number: 17-W2593  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 28 Jun 17 8:50  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW103

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.42 units	NA	SM 4500 H+ B	28 Jun 17 8:50	DJN
Temperature - Field	12.4 Degrees C	NA	SM 2550B	28 Jun 17 8:50	DJN
Conductivity - Field	1573 umhos/cm	1	EPA 120.1	28 Jun 17 8:50	DJN
Radium 226	See Attached Report			3 Aug 17	OL
Radium 228	See Attached Report			30 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll <sup>cc</sup> 28 Aug 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 St  
Bismarck ND 58501

Report Date: 21 Aug 17  
Lab Number: 17-W2594  
Work Order #: 82-1734  
Account #: 002800  
Date Sampled: 27 Jun 17 16:50  
Date Received: 28 Jun 17 14:43  
Sampled By: Client

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW109

Temp at Receipt: 0.9C

Event and Year: June 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.29	units	NA	SM 4500 H+ B	27 Jun 17 16:50	DJN
Temperature - Field	17.4	Degrees C	NA	SM 2550B	27 Jun 17 16:50	DJN
Conductivity - Field	1708	umhos/cm	1	EPA 120.1	27 Jun 17 16:50	DJN
Radium 226	See Attached Report				3 Aug 17	OL
Radium 228	See Attached Report				30 Jul 17	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll *CC* *28 Aug 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: 1 of 1

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

Report Date: 21 Aug 17
Lab Number: 17-W2595
Work Order #: 82-1734
Account #: 002800
Date Sampled: 27 Jun 17
Date Received: 28 Jun 17 14:43
Sampled By: Client

Project Name: MDU Lewis & Clark

Sample Description: Dup 1

PO #: 165273 OP

Event and Year: June 2017

Temp at Receipt: 0.9C

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Radium 226 and Radium 228, both with 'See Attached Report' and 'OL' analyst.

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll (handwritten signature) 28 Aug 17 (handwritten date)
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 guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.







Date: 8/17/2017

**CLIENT:** MVTL Laboratories, Inc.  
**Project:** 201782-1734  
**Lab Order:** S1707004

**CASE NARRATIVE**  
**Report ID:** S1707004001

Samples 17-W2586 MW110, 17-W2587 MW119, 17-W2588 MW210, 17-W2589 MW102, 17-W2590 MW118, 17-W2591 MW111, 17-W2592 MW117, 17-W2593 MW103, 17-W2594 MW109, 17-W2595 Dup 1, and 17-W2596 FB were received on July 3, 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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-001  
**ClientSample ID:** 17-W2586 MW110  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/26/2017 2:44:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 810	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 810	MB
Radium 228	0.2	pCi/L		1	Ga-Tech	07/29/2017 1401	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/29/2017 1401	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-002  
**ClientSample ID:** 17-W2587 MW119  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/26/2017 5:35:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.18	pCi/L		0.2	SM 7500 Ra-B	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	-3.6	pCi/L		1	Ga-Tech	07/29/2017 1704	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/29/2017 1704	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-003  
**ClientSample ID:** 17-W2588 MW210  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/26/2017 7:35:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	0.6	pCi/L		1	Ga-Tech	07/29/2017 2007	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/29/2017 2007	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-004  
**ClientSample ID:** 17-W2589 MW102  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017 9:46:00 AM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**FieldSampler:**  
**Matrix:** Water

#### Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
<b>Radionuclides - Total</b>							
Radium 226	0.5	pCi/L		0.2	SM 7500 Ra-B	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	-1.1	pCi/L		1	Ga-Tech	07/29/2017 2310	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/29/2017 2310	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-005  
**ClientSample ID:** 17-W2590 MW118  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017 3:10:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.05	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	-0.4	pCi/L		1	Ga-Tech	07/30/2017 213	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/30/2017 213	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-006  
**ClientSample ID:** 17-W2591 MW111  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017 12:55:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	0.5	pCi/L		1	Ga-Tech	07/30/2017 517	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/30/2017 517	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-007  
**ClientSample ID:** 17-W2592 MW117  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017 10:55:00 AM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	-2.6	pCi/L		1	Ga-Tech	07/30/2017 820	MB
Radium 228 Precision (±)	1.6	pCi/L			Ga-Tech	07/30/2017 820	MB

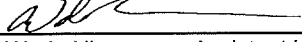
These results apply only to the samples tested.

#### 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, Assistant Laboratory Manager



### Sample Analysis Report

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

**Date Reported** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-008  
**ClientSample ID:** 17-W2593 MW103  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/28/2017 8:50:00 AM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	-1.2	pCi/L		1	Ga-Tech	07/30/2017 1123	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/30/2017 1123	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-009  
**ClientSample ID:** 17-W2594 MW109  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017 4:50:00 PM  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/03/2017 1131	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/03/2017 1131	MB
Radium 228	0.5	pCi/L		1	Ga-Tech	07/30/2017 1425	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	07/30/2017 1425	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-010  
**ClientSample ID:** 17-W2595 Dup 1  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/27/2017  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/17/2017 846	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	08/17/2017 846	MB
Radium 228	-1.1	pCi/L		1	Ga-Tech	08/06/2017 1324	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	08/06/2017 1324	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** 8/17/2017  
**Report ID** S1707004001

**ProjectName:** 201782-1734  
**Lab ID:** S1707004-011  
**ClientSample ID:** 17-W2596 FB  
**COC:** 201782-1734

**WorkOrder:** S1707004  
**CollectionDate:** 6/28/2017  
**DateReceived:** 7/3/2017 10:49:00 AM  
**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	08/10/2017 1549	MB
Radium 226 Precision (±)	0.04	pCi/L			SM 7500 Ra-B	08/10/2017 1549	MB
Radium 228	-2.7	pCi/L		1	Ga-Tech	08/06/2017 1627	MB
Radium 228 Precision (±)	1.5	pCi/L			Ga-Tech	08/06/2017 1627	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: S1707004  
Project: 201782-1734

Date: 8/17/2017  
Report ID: S1707004001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-450 (07/27/17 16:14)	Analyte	RunNo: 148477	PrepDate: 07/12/17 14:00	BatchID 13495					
		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-450 (07/27/17 19:17)	Analyte	RunNo: 148477	PrepDate: 07/12/17 14:00	BatchID 13495					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		34	1	39.3		85.5	65.9 - 132		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-450 (07/28/17 01:23)	Analyte	RunNo: 148477	PrepDate: 07/12/17 14:00	BatchID 13495					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		41	1	39.3	ND	105	50 - 139		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-450 (07/28/17 04:27)	Analyte	RunNo: 148477	PrepDate: 07/12/17 14:00	BatchID 13495					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		36	1	41	13.8	91.7	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



ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
Work Order: S1707004
Project: 201782-1734

Date: 8/17/2017
Report ID: S1707004001

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1776 (08/03/17 08:10) Radium 226, RunNo: 148678, PrepDate: 07/26/17 0:00, BatchID 13517, Result: ND, RL: 0.2.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MB-1777 (08/10/17 15:49) Radium 226, RunNo: 148982, PrepDate: 07/31/17 0:00, BatchID 13530, Result: ND, RL: 0.2.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1776 (08/03/17 08:10) Radium 226, RunNo: 148678, PrepDate: 07/26/17 0:00, BatchID 13517, Result: 6.0, RL: 0.2, Spike: 6.41, %REC: 93.9, % Rec Limits: 67.1 - 122.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: LCS-1777 (08/10/17 15:49) Radium 226, RunNo: 148982, PrepDate: 07/31/17 0:00, BatchID 13530, Result: 5.9, RL: 0.2, Spike: 6.41, %REC: 92.5, % Rec Limits: 67.1 - 122.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MS-1776 (08/03/17 08:10) Radium 226, RunNo: 148678, PrepDate: 07/26/17 0:00, BatchID 13517, Result: 5.6, RL: 0.2, Spike: 6.41, ND, %REC: 87.4, % Rec Limits: 65 - 131.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Spike, Ref Samp, %REC, % Rec Limits, Qual. Row 1: MS-1777 (08/10/17 15:49) Radium 226, RunNo: 148982, PrepDate: 07/31/17 0:00, BatchID 13530, Result: 5.6, RL: 0.2, Spike: 6.41, ND, %REC: 86.4, % Rec Limits: 65 - 131.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: MSD-1776 (08/03/17 08:10) Radium 226, RunNo: 148678, PrepDate: 07/26/17 0:00, BatchID 13517, Result: 6.0, RL: 0.2, Conc: 5.6, %RPD: 5.89, %REC: 92.7, % RPD Limits: 20.

Table with 10 columns: Analyte, RunNo, PrepDate, BatchID, Result, RL, Conc, %RPD, %REC, % RPD Limits, Qual. Row 1: MSD-1777 (08/10/17 15:49) Radium 226, RunNo: 148982, PrepDate: 07/31/17 0:00, BatchID 13530, Result: 5.8, RL: 0.2, Conc: 5.6, %RPD: 5.14, %REC: 91.0, % RPD Limits: 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

201782-1734

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: 29-Jun-17
	Project Name/Number:	Purchase Order #: BL5917

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
S 1707004 001	17-W2586	MW110	GW	26-Jun-17	1444		4					Ra226 & Ra228
002	17-W2587	MW119	GW	26-Jun-17	1735		4					Ra226 & Ra228
003	17-W2588	MW210	GW	26-Jun-17	1935		4					Ra226 & Ra228
004	17-W2589	MW102	GW	27-Jun-17	941 946*		4					Ra226 & Ra228
005	17-W2590	MW118	GW	27-Jun-17	1510		4					Ra226 & Ra228
006	17-W2591	MW111	GW	27-Jun-17	1255		4					Ra226 & Ra228
007	17-W2592	MW117	GW	27-Jun-17	1055		4					Ra226 & Ra228
008	17-W2593	MW103	GW	28-Jun-17	850		4					Ra226 & Ra228
009	17-W2594	MW109	GW	27-Jun-17	1650		4					Ra226 & Ra228
010	17-W2595	Dup 1	GW	27-Jun-17			4					Ra226 & Ra228
011	17-W2596	FB	GW	28-Jun-17			4					Ra226 & Ra228

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

\* @ cc 28 Aug 17

3 coolers

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
M. BAUMGARTNER	29-Jun-17	1700		Kathy Boop	7.3.17	25.2°
2.						24.9

24.4



# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Neswag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	26 June 17		Time: 0640			
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		19.74	7.02	7.00	6.95-7.05	-13.5
Buffer 10		19.83	10.08	10.00	9.95-10.05	-190.6
Conductivity			Check			
Buffer 1413		19.87	1432	1414	±10%	Buffer 5000 4982
ORP			±10 mV			
231 mV @ 25C		19.71	232.7	231.0		
DO			Barometric Pressure (mm Hg)			
		20.05	8.45	8.65	mg/L	718.7

Pre Site Calibration						
Date:	27 June 17		Time: 0640			
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		22.08	7.02	7.00	6.95-7.05	-14.9
Buffer 10		22.02	9.95	9.94	9.95-10.05	-190.1
Conductivity			Check			
Buffer 1413		22.03	1405	1413	±10%	Buffer 5000 4988
ORP			±10 mV			
231 mV @ 25C		22.09	226.1	231.0		
DO			Barometric Pressure (mm Hg)			
		21.15	8.33	8.57	mg/L	700.0

Post Site Check			
Time:	0815 2015		
	pH	Temp °C	Reading
Buffer 7		23.44	7.03
Conductivity			
Buffer 1413		23.58	1408

Post Site Check			
Time:	1727		
	pH	Temp °C	Reading
Buffer 7		30.07	6.99
Conductivity			
Buffer 1413		30.05	1405

# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Meyer

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	22.13	6.99	7.00	6.95-7.05	-14.0	0 +/- 50
Buffer 10	22.13	10.02	10.00	9.95-10.05	-190.2	-180 +/- 50
<b>Conductivity</b>						Check
Buffer 1413	21.98	1389	1413	±10%	Buffer 5000	5015
<b>ORP</b>	21.88	2365	231.0			
231 mV @ 25C	<del>22.13</del>	<del>10.02</del>	<del>10.00</del>	±10 mV		
<b>DO</b>				Barometric Pressure (mm Hg)		
	21.44	7.36	8.17	mg/L	702.6	

Post Site Check		
Time:		
<b>pH</b>	Temp °C	Reading
Buffer 7	19.92	7.04
<b>Conductivity</b>		
Buffer 1413	20.02	1419

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 1413				±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 1413		



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW110  
Sampling Personal: *Darren Niebauer*

Weather Conditions: Temp: 76 °F Wind: S10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" 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:	9.33	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	14.38	ft
Water Level After Sample:	7.42	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input type="checkbox"/>	No <input checked="" 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:	26 Jun 17	Time Purging Began:	11:04	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	
Sample Date:	26 Jun 17	Time of Sampling:	14:44	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	11:19	14.63	1114	7.33	2.69	158.3	71000	9.39	500	Turbid, Tan
2	11:39	14.54	1114	7.35	2.82	174.9	272	9.39	2000	Slightly turbid
3	11:59	14.31	1109	7.34	3.08	190.1	155	9.39	2000	ST
4	12:29	14.34	1107	7.28	3.00	204.3	57.8	9.39	3000	ST
5	12:59	14.57	1106	7.36	3.13	209.8	28.7	9.42	3000	ST
6	13:29	14.43	1107	7.35	3.21	215.8	16.4	9.40	3000	Clear
7	13:59	14.41	1107	7.36	3.23	222.6	9.48	9.42	3000	clear
8	14:19	14.64	1110	7.35	3.25	224.2	8.15	9.42	2000	clear
9	14:24	14.68	1111	7.35	3.21	225.7	6.18	9.42	500	clear
10	14:29	14.85	1109	7.36	3.25	225.9	4.97	9.42	500	clear

Stabilized: Yes  No

Total Volume Removed:          mL

Comments:

*Next page*

*When lowering the pump there is a catch in the well. I think the PVC is coming apart a little more down.*



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: MW110  
 Sampling Personal: Darren Niswan  
 Date: 26 Jun 17

### 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									
12	1434	14.73	1110	7.34	3.27	226.7	4.57	9.42	500	clear
13	1439	14.56	1110	7.33	3.29	228.8	4.48	9.42	500	clear
14	1449	14.50	1112	7.34	3.29	229.7	4.42	9.42	500	clear
15							e			
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: Yes No

Total Volume Removed: 24,000 mL

Comments:



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark

Event: 2017

Sample ID: MW119

Sampling Personal: Darren Nieswazy

Weather Conditions: Temp: 85 °F Wind: 510 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	Not Visible
Repairs Necessary:	—		
Casing Diameter:	2"		
Water Level Before Purge:	9.19	ft	
Total Well Depth:	—	ft	
Well Volume:	—	liters	
Depth to Top of Pump:	13.20	ft	
Water Level After Sample:	9.20	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings	
Sampling Method:	Bladder	Purge:	5 sec.
Dedicated Equip?:	Yes No	Recover:	55 sec.
Duplicate Sample?:	Yes No	PSI:	—
Duplicate Sample ID:	—	Pumping Rate:	100 mL/min
Purge Date:	26 Jun 17	Time Purging Began:	1650 am/pm
Well Purged Dry?	Yes No	Time Purged Dry:	— am/pm
Sample Date:	26 Jun 17	Time of Sampling:	1735 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1710		14.17	1170	7.38	1.02	159.3	5.06	9.19	1500	clear
3	1715		14.30	1172	7.37	1.06	134.5	3.64	9.20	100	clear
4	1720		14.01	1172	7.38	1.14	122.8	2.17	9.20	500	clear
5	1725		14.26	1171	7.37	1.18	104.8	1.92	9.20	500	clear
6	1730		14.12	1172	7.37	1.20	101.9	1.83	9.20	500	clear
7	1735		14.05	1173	7.38	1.23	99.7	1.80	9.20	500	clear
8											
9											
10											

Stabilized: Yes No

Total Volume Removed: 4000 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark

Event: 2017

Sample ID: MW210

Sampling Personal: Darren Niesney

Weather Conditions: Temp: 83 °F Wind: S11 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:		2"	
Water Level Before Purge:		9.40	ft
Total Well Depth:		~	ft
Well Volume:		-	liters
Depth to Top of Pump:		30.82	ft
Water Level After Sample:		11.48	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	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:	-	Pumping Rate:	100 mL/min
Purge Date:	26 Jun 17	Time Purging Began:	1840 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No	Time Purged Dry:	- am/pm
Sample Date:	26 Jun 17	Time of Sampling:	1935 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw	
	500 mL Nitric (filtered)	4 - 1 Liter 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	1845	13.48	1438	7.58	1.32	-32.1	199	10.29	500	slightly turbid
2	1900	13.77	1438	7.61	0.46	-89.6	48.6	11.21	1500	ST
3	1915	13.98	1439	7.61	0.30	-103.3	17.4	11.36	1500	clear
4	1920	13.49	1440	7.61	0.25	-106.3	9.23	11.38	500	clear
5	1925	14.04	1436	7.61	0.28	-108.3	4.92	11.38	500	clear
6	1930	13.96	1436	7.60	0.28	-108.8	4.73	11.28	500	clear
7	1935	14.05	1438	7.61	0.29	-109.3	4.61	11.46	500	clear
8										
9										
10										

Stabilized:  Yes  No

Total Volume Removed: 5500 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: AWA-10-MW102  
 Sampling Personal: Darren Nierney

Weather Conditions: Temp: 64 °F Wind: 511 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" 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"/>	<u>Not Visible</u>
Repairs Necessary:		
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>19.28</u>	ft
Total Well Depth:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>21.90</u>	ft
Water Level After Sample:	<u>19.68</u>	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	<u>Bladder</u>	Control Settings
Sampling Method:	<u>Bladder</u>	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>—</u>
Duplicate Sample ID:	<u>—</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>27 June 17</u>	Time Purging Began: <u>0941</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>27 June 17</u>	Time of Sampling: <u>0946</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter Nitric

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	0816	11.49	6659	6.98	0.44	2.2	35.2	19.68	3000	ST
3	0846	12.09	6700	6.97	0.24	-4.0	14.0	19.68	3000	ch
4	0916	12.00	6739	6.98	0.16	-10.4	9.74	19.64	3000	ch
5	0931	12.19	6732	6.99	0.17	-11.9	5.98	19.68	1500	ch
6	0936	12.17	6767	6.98	0.17	-12.2	4.77	19.68	500	ch
7	0941	12.36	6744	6.98	0.16	-12.7	4.56	19.68	500	ch
8	0946	12.61	6720	6.99	0.16	-12.9	4.47	19.68	500	ch
9										
10										

Stabilized: Yes No

Total Volume Removed: 12500 mL

Comments:



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: nw118  
 Sampling Personal: Parren Miesing

Weather Conditions: \_\_\_\_\_ Temp: 88 °F Wind: NW15 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:	8.78	ft	
Total Well Depth:	_____		
Well Volume:	_____ liters		
Depth to Top of Pump:	9.48	ft	
Water Level After Sample:	8.90	ft	
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: _____ sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: _____
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>2/27/17</u>	Time Purging Began: <u>1400</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry: _____ am/pm
Sample Date:	<u>2/27/17</u>	Time of Sampling: <u>1510</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter 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	1405	20.98	1693	7.36	3.34	229.2	218	8.88	500	Turbid, tan
2	1425	19.55	1693	7.38	2.01	237.8	22.8	8.92	2000	slightly turbid
3	1430	19.63	1695	7.40	2.03	241.6	11.2	8.90	500	clear
4	1435	19.13	1692	7.40	1.99	243.9	7.32	8.90	500	clear
5	1450	20.36	1697	7.41	1.98	249.1	5.43	8.90	500	clear
6	1455	20.46	1698	7.41	2.00	250.5	4.46	8.90	500	clear
7	1500	20.56	1698	7.41	1.97	252.1	4.76	8.90	500	clear
8	1505	20.09	1701	7.42	2.04	253.6	4.82	8.90	500	clear
9	1510	20.55	1698	7.41	1.96	254.9	4.96	8.90	500	clear
10										

Stabilized:  Yes  No  
 Comments: \_\_\_\_\_

Total Volume Removed: 8000 mL





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 111  
Sampling Personal: Darren Nieswong

Weather Conditions: \_\_\_\_\_ Temp: 80°F Wind: S13 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:	8.34	ft	
Total Well Depth:		ft	
Well Volume:		liters	
Depth to Top of Pump:	13.35	ft	
Water Level After Sample:	8.36	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"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI: _____
Duplicate Sample ID:	_____	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>27 June 17</u>	Time Purging Began: <u>1100</u> am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	Time Purged Dry: _____ am/pm
Sample Date:	<u>27 June 17</u>	Time of Sampling: <u>1255</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	4 - 1 Liter Nitric

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1215	16.55	3727	7.15	2.057	249.0	22.5	8.36	1000	ST
3	1235	15.75	3693	7.22	2.14	254.8	7.21	8.36	2000	Clear
4	1240	15.50	3103	7.22	2.25	256.9	3.89	8.36	500	Clear
5	1245	15.50	3694	7.24	2.29	258.2	2.16	8.36	500	Clear
6	1250	15.61	3701	7.23	2.30	261.5	2.34	8.36	500	Clear
7	1255	15.43	3691	7.24	2.34	262.3	2.37	8.36	500	Clear
8										
9										
10										

DO 2.03

Stabilized: Yes No  
Comments: \_\_\_\_\_

Total Volume Removed: 5500 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: ny117  
Sampling Personal: Darwin Niesman

Weather Conditions: Temp: 63 °F Wind: 513 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Well Labeled?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Casing Straight?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Grout Seal Intact?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	6.76		ft
Total Well Depth:			
Well Volume:	-		
Depth to Top of Pump:	9.85		ft
Water Level After Sample:	Top of Pump		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	Recover:	55 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	-
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	26 Jun 17		Time Purging Began:	1549 am/pm
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	1644 am/pm
Sample Date:	27 June 17		Time of Sampling:	0955 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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
2	1604	15.67	8356	7.03	5.79	249.5	28.7	7.36	1000	st	
3	1614	14.93	8199	7.07	7.07	269.0	17.1	7.74	1000	clear	
4	1624	14.90	8215	7.06	6.53	279.3	10.3	7.79	1500	clear	
5	1644	14.33	8246	7.07	5.62	283.0	8.61	9.85	1500	clear	
6											
7											
8	0950	Purged line for 5 min before sample							7.82		
9	0955	13.88	8501	7.10	6.09	238.6	16.1	8.14	500	clear	
10											

Stabilized: Yes  No

Total Volume Removed: 6,000 mL

Comments:

There wasn't enough water in well to get stabilization.



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW103  
Sampling Personal: Jarrett N. [Signature]

Weather Conditions: \_\_\_\_\_ Temp: 62 °F Wind: Light 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>10.77</u> ft		
Total Well Depth:	<u>-</u> ft		
Well Volume:	<u>-</u> liters		
Depth to Top of Pump:	<u>17.15</u> ft		
Water Level After Sample:	<u>10.79</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?:	Yes	<u>No</u>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	
Duplicate Sample ID:	<u>-</u>		Pumping Rate: <u>100</u> mL/min	
Purge Date:	<u>28 Jun 17</u>	Time Purging Began:	<u>0745</u> am/pm	
Well Purged Dry?	Yes	<u>No</u>	Time Purged Dry:	<u>-</u> am/pm
Sample Date:	<u>28 Jun 17</u>	Time of Sampling:	<u>0850</u> am/pm	
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	<u>0750</u>	<u>12.42</u>	<u>8088</u>	<u>7.22</u>	<u>553</u>	<u>259.7</u>	<u>446</u>	<u>10.79</u>	<u>500</u>	<u>Turbid grey</u>
2	<u>0820</u>	<u>12.28</u>	<u>1593</u>	<u>7.43</u>	<u>210</u>	<u>241.5</u>	<u>42.0</u>	<u>10.79</u>	<u>1500</u>	<u>slightly turbid</u>
3	<u>0830</u>	<u>12.30</u>	<u>1594</u>	<u>7.43</u>	<u>0.31</u>	<u>242.5</u>	<u>13.1</u>	<u>10.79</u>	<u>1000</u>	<u>clear</u>
4	<u>0840</u>	<u>12.46</u>	<u>1569</u>	<u>7.42</u>	<u>0.32</u>	<u>241.6</u>	<u>3.83</u>	<u>10.79</u>	<u>1000</u>	<u>cl</u>
5	<u>0845</u>	<u>12.39</u>	<u>1572</u>	<u>7.42</u>	<u>0.37</u>	<u>241.9</u>	<u>3.28</u>	<u>10.79</u>	<u>500</u>	<u>cl</u>
6	<u>0850</u>	<u>12.44</u>	<u>1573</u>	<u>7.42</u>	<u>0.30</u>	<u>241.7</u>	<u>3.52</u>	<u>10.79</u>	<u>500</u>	<u>cl</u>
7										
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 6500 mL

Comments: [Signature]



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: May 109  
Sampling Personal: Racem Niemy

Weather Conditions: Temp: 84 °F Wind: NW15 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:	<u>—</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>10.89</u>		ft
Total Well Depth:			ft
Well Volume:			liters
Depth to Top of Pump:	<u>13.92</u>		ft
Water Level After Sample:			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>—</u>
Duplicate Sample ID:	<u>Dup-1</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>27 June 17</u>	Time Purging Began:	<u>1615</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>27 June 17</u>	Time of Sampling:	<u>1650</u>	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)	4 - 1 Liter 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	<u>1620</u>	<u>19.22</u>	<u>1794</u>	<u>7.25</u>	<u>1.98</u>	<u>228.5</u>	<u>32.5</u>	<u>10.84</u>	<u>500</u>	<u>slightly turbid</u>
2	<u>1630</u>	<u>17.46</u>	<u>1709</u>	<u>7.28</u>	<u>0.23</u>	<u>222.6</u>	<u>7.64</u>	<u>10.84</u>	<u>1000</u>	<u>clear</u>
3	<u>1635</u>	<u>17.28</u>	<u>1704</u>	<u>7.28</u>	<u>0.24</u>	<u>222.3</u>	<u>3.28</u>	<u>10.84</u>	<u>500</u>	<u>clear</u>
4	<u>1640</u>	<u>17.43</u>	<u>1703</u>	<u>7.28</u>	<u>0.22</u>	<u>221.9</u>	<u>2.06</u>	<u>10.84</u>	<u>500</u>	<u>clear</u>
5	<u>1645</u>	<u>17.44</u>	<u>1709</u>	<u>7.29</u>	<u>0.20</u>	<u>221.0</u>	<u>1.90</u>	<u>10.84</u>	<u>500</u>	<u>clear</u>
6	<u>1650</u>	<u>17.35</u>	<u>1708</u>	<u>7.29</u>	<u>0.19</u>	<u>220.4</u>	<u>1.93</u>	<u>10.84</u>	<u>500</u>	<u>clear</u>
7	<u>f</u>									
8										
9										
10										

Stabilized: Yes No  
Comments: —

Total Volume Removed: 3500 mL



# Laboratories, Inc.

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

# Chain of Custody Record

<b>Project Name:</b> MDU Lewis and Clark	<b>Event:</b> June 2017	<b>Work Order Number:</b> 82-1734
<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 Nieswaag

Lab Number	Sample ID	Sample Information			Bottle Type				Field Parameters			Analysis Required	
		Date	Time	Sample Type	1 liter Nitric					Temp (°C)	Spec. Cond.		pH
W2586	MW110	26 June 17	1444	GW	4					14.50	1112	7.34	Rad 226 & Rad 228
W2587	MW119	26 June 17	1735	GW	4					14.25	1173	7.38	
W2588	MW210	26 June 17	1935	GW	4					14.05	1438	7.61	
W2589	MW102	27 June 17	0946	GW	4					12.61	6720	6.99	
W2590	MW118	27 June 17	1510	GW	4					20.55	1698	7.41	
W2591	MW111	27 June 17	1255	GW	4					15.43	3691	7.24	
W2592	MW117	27 June 17	1055	GW	4					13.88	8501	7.10	
W2593	MW103	28 June 17	0850	GW	4					12.44	1573	7.42	
W2594	MW109	27 June 17	1650	GW	4					17.35	1708	7.29	
W2595	Dup 1	27 June 17	NA	GW	4					NA	NA	NA	
W2596	Field Blank (FB)	28 June 17	NA	W	4					NA	NA	NA	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswaag</i>	28 June 17 1443	(Log In) Walk In #2	0.9 TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>Travis</i>	28 June 2017 1443



**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.mvttl.com



November 3, 2017

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

RE: Groundwater Sampling Event - 2017 at MDU Lewis & Clark Site

Dear Ms. Marshall:

It was brought to MVTL's attention that some of the summary data in the Field Data Report did not match the Raw Data collected in the field. Attached to this letter is the corrected Field Data Report.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Jeremy Meyer", is written over a light blue horizontal line.

Jeremy Meyer  
MVTL Field Services



**MVTL Laboratories Inc.**  
FIELD DATA REPORT

**MDU Lewis and Clark**  
CCR Sampling

WO# 82-2765

Attn: Samantha Marshall  
400 North 4th St  
Bismarck, ND 58501

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WATER LEVEL START (FT)	WATER LEVEL END (FT)	VOLUME REMOVED (mL)	SAMPLE METHOD	FIELD READINGS				SAMPLE APPEARANCE
									TEMP (°C)	EC	pH	Turb. NTU	
MW110	2-Oct-17	14:31	2-Oct-17	16:36	8.94*	NR	12500.0	Bladder	13.07	1109	7.32	4.41	clear
MW119	2-Oct-17	16:59	2-Oct-17	17:59	8.72	8.81	6000.0	Bladder	13.58	1172	7.30	2.53	clear
MW210	2-Oct-17	18:15	2-Oct-17	19:30	8.96	NR	7500.0	Bladder	10.90	1447	7.59	4.37	clear
MW102	3-Oct-17	7:27	3-Oct-17	9:02	19.10	NR	9500.0	Bladder	9.45	6523	6.99	4.83	clear
MW118	3-Oct-17	11:42	3-Oct-17	12:42	8.57	8.60	6000.0	Bladder	12.25	1617	7.46	3.12	clear
MW111	3-Oct-17	10:15	3-Oct-17	11:20	7.96	8.00	6500.0	Bladder	12.05	3425	7.25	3.12	clear
MW117	2-Oct-17	13:25	3-Oct-17	9:36	6.27	8.52	6000.0	Bladder	10.48	7884	7.16	14.60	clear
MW103	3-Oct-17	14:25	3-Oct-17	16:10	10.38	10.43	10500.0	Bladder	13.54	1476	7.33	3.66	clear
MW109	3-Oct-17	13:15	3-Oct-17	14:00	10.36	10.41	4500.0	Bladder	12.01	1629	7.32	1.68	clear
MW101	NA	NA	3-Oct-17	9:25	8.86	NA	NA	WL	NA	NA	NA	NA	Water Level
MW105	NA	NA	3-Oct-17	13:22	8.70	NA	NA	WL	NA	NA	NA	NA	Water Level
MW106	NA	NA	3-Oct-17	11:23	9.51	NA	NA	WL	NA	NA	NA	NA	Water Level
MW107	NA	NA	3-Oct-17	9:27	4.37	NA	NA	WL	NA	NA	NA	NA	Water Level
MW108	NA	NA	3-Oct-17	10:09	16.44	NA	NA	WL	NA	NA	NA	NA	Water Level
MW116	NA	NA	3-Oct-17	16:37	9.84	NA	NA	WL	NA	NA	NA	NA	Water Level

NR= Not Recorded on Field Sheet NA = Not Applicable

\* Amended on 3 Nov 17



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW110  
Sampling Personal: Darren Nielsen

Weather Conditions: Temp: 50 °F Wind: SW 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:	<input type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.94		ft
Total Well Depth:	-		ft
Well Volume:	liters		
Depth to Top of Pump:	13.39		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"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	PSI:	<del>30</del> 15
Duplicate Sample ID:	-		
Purge Date:	2 Oct 17	Time Purging Began:	1431 <del>am</del> pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	2 Oct 17	Time of Sampling:	1636 am/pm
Bottle	500 mL Nitric	1 Liter Raw	
List:	500 mL Nitric (filtered)		

### 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
									clear, slightly turbid
									clear
									clear
									clear
									clear
									clear
									clear
									clear
									clear
									clear
									clear

Stabilized: Yes No

Total Volume Removed: 12500 mL

Comments: (circled)





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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW119  
Sampling Personal: Darren Nieswaj

Weather Conditions: Temp: 50 °F Wind: SW 20 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:	8.72 ft		
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	13.63 ft		
Water Level After Sample:	8.81 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:	—
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	20 Oct 17	Time Purging Began:	1659	am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	— am/pm
Sample Date:	20 Oct 17	Time of Sampling:	1759	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### 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	1704	13.94	1167	7.33	2.82	228.3	7.17	8.81	500	cl
2	1719	13.82	1168	7.31	1.08	223.3	11.6	8.81	1500	cl
3	1734	13.80	1170	7.33	1.14	212.7	8.20	8.81	1500	cl
4	1739	13.74	1171	7.32	1.12	213.4	5.23	8.81	500	cl
5	1744	13.67	1173	7.30	1.10	132.3	3.43	8.81	500	cl
6	1749	13.52	1172	7.30	1.06	96.7	2.77	8.81	500	cl
7	1754	13.45	1172	7.30	1.10	93.1	2.61	8.81	500	cl
8	1759	13.58	1172	7.30	1.07	87.0	2.53	8.81	500	cl
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 6000 mL



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW210  
Sampling Personal: Darren Niesmay

Weather Conditions: Temp: 50 °F Wind: SW 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:	<input checked="" type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	8.96	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	28.60	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 type="checkbox"/>	No <input checked="" type="checkbox"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	PSI:	-
Duplicate Sample ID:	Dup-1		Pumping Rate:	100 mL/min
Purge Date:	20 Oct 17	Time Purging Began:	1815	am/pm
Well Purged Dry?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Time Purged Dry:	-
Sample Date:	20 Oct 17	Time of Sampling:	1930	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### 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	
1	1820	12.35	1452	7.64	4.03	-21.2	52.0	9.91	500	clear slightly turbid
2	1840	11.65	1449	7.62	0.33	-108.0	24.6	10.81	2000	clear
3	1900	11.32	1452	7.61	0.25	-110.2	9.2	10.94	2000	clear
4	1910	11.22	1451	7.60	0.21	-110.4	6.68	10.95	1000	clear
5	1920	11.12	1449	7.60	0.20	-110.6	4.53	10.95	1000	clear
6	1925	11.05	1451	7.60	0.24	-110.1	4.74	10.95	500	clear
7	1930	10.90	1447	7.59	0.22	-109.7	4.37	10.95	500	clear
8										
9										
10										

Stabilized: Yes  No   
Comments:

Total Volume Removed: 7500 mL



# Field Datasheet

## Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Lewis and Clark  
 Event: 2017  
 Sample ID: NV102  
 Sampling Personal: Darria Nieswager

Weather Conditions: Temp: 50.3 °F Wind: SW 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"/>	<u>Not Visible</u>
Repairs Necessary:	<u>—</u>	
Casing Diameter:	<u>2"</u>	
Water Level Before Purge:	<u>30 Oct 17</u>	<u>9.10</u> ft
Total Well Depth:	<u>—</u> ft	
Well Volume:	<u>—</u> liters	
Depth to Top of Pump:	<u>20.97</u> ft	
Water Level After Sample:	<u>—</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?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>		
		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>3 Oct 17</u>	Time Purging Began:	<u>8:27</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>3 Oct 17</u>	Time of Sampling:	<u>0902</u> am/pm
Bottle List:	<u>500 mL Nitric</u>	<u>1 Liter Raw</u>	
	<u>500 mL Nitric (filtered)</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 #
									clear, slightly turbid, turbid	
1	0732	8.98	6474	6.96	5.38	92.0	31.5	19.33	500	clear
2	0802	8.68	6538	6.99	0.77	3.8	11.4	19.36	3000	clear
3	0817	8.90	6529	6.98	0.52	-1.0	9.77	19.37	1500	clear
4	0832	8.50	6526	6.98	0.42	-4.4	8.32	19.39	1500	clear
5	0847	9.42	6522	7.00	0.35	-9.2	5.34	19.39	1500	clear
6	0852	9.43	6521	7.00	0.35	-9.5	4.97	19.39	500	clear
7	0857	9.52	6518	7.00	0.34	-9.3	4.91	19.39	500	clear
8	0902	9.45	6523	6.99	0.33	-9.5	4.83	19.39	500	clear
9										
10										

Stabilized: Yes No

Total Volume Removed: 9500 mL

Comments: —



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW118  
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 37 °F Wind: SW 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:	8.57		ft
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	9.80		ft
Water Level After Sample:	8.60		ft
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes <input type="checkbox"/>	No <input checked="" 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:	3 Oct 17		Time Purging Began:	1142 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	3 Oct 17		Time of Sampling:	1242 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### 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	1147	11.92	1618	7.46	5.22	153.7	571	8.58	500	Turbid
2	1207	12.64	1615	7.45	2.33	127.4	16.8	8.58	2000	clear
3	1222	12.28	1612	7.45	2.27	132.7	6.30	8.61	1500	clear
4	1227	12.46	1612	7.46	2.27	134.5	4.25	8.60	500	clear
5	1232	12.24	1617	7.46	2.29	137.1	3.57	8.60	500	clear
6	1237	12.13	1615	7.46	2.30	139.2	3.32	8.60	500	clear
7	1242	12.25	1617	7.46	2.29	141.4	3.12	8.61	500	clear
8										
9										
10										

Stabilized: Yes  No   
Comments:

Total Volume Removed: 6000 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW111  
Sampling Personal: Darion Wisniewski

Weather Conditions: Temp: 37 °F Wind: NW 5-10 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:	<input type="checkbox"/>	
Casing Diameter:	2"	
Water Level Before Purge:	<u>7.96</u>	ft
Total Well Depth:		ft
Well Volume:	-	liters
Depth to Top of Pump:	<u>15.29</u>	ft
Water Level After Sample:	<u>8.00</u>	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 type="checkbox"/> No <input checked="" type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	PSI: <u>-</u>
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>3 Oct 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>3 Oct 17</u>	Time of Sampling: <u>1120</u> am/pm
Bottle List:	500 mL Nitric	1 Liter Raw
	500 mL Nitric (filtered)	

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1020	11.57	<u>4014</u>	7.07	5.35	184.0	26.0	8.01	500	clear
2	1040	12.34	3736	7.14	1.69	171.9	16.7	8.00	2000	clear
3	1100	12.07	3466	7.23	2.96	188.9	7.71	8.00	2000	cl
4	1105	12.62	3452	7.24	2.87	192.6	3.86	8.00	500	cl
5	1110	12.27	3437	7.24	2.94	193.9	3.02	8.00	500	cl
6	1115	12.44	3418	7.25	3.00	192.1	2.95	8.00	500	cl
7	1120	12.05	3425	7.25	3.10	200.9	3.12	8.00	500	cl
8										
9										
10										

Stabilized:  Yes  No  
Comments:

Total Volume Removed: 6500 mL



# Field Datasheet

## Groundwater Assessment

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

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW117  
Sampling Personal: Parren Mierau

Weather Conditions: Temp: 307 °F Wind: SW 5-10 Precip: Sunny / Partly Cloudy / Cloudy

### Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/>	
Well Labeled?	<del>Yes</del> No	
Casing Straight?	<del>Yes</del> No	
Grout Seal Intact?	<del>Yes</del> No	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	<u>6.27</u>	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:	<u>9.85</u>	ft
Water Level After Sample:	<u>7.52</u>	ft
Measurement Method:	Electric Water Level Indicator	

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<u>5</u> sec.
Dedicated Equip?:	<del>Yes</del> No		Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<del>No</del>	PSI:	
Duplicate Sample ID:			Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>20 Oct 17</u>	Time Purging Began:	<u>1325</u>	am/pm
Well Purged Dry?:	<del>Yes</del> No	Time Purged Dry:		am/pm
Sample Date:	<u>30 Oct 17</u>	Time of Sampling:	<u>0936</u>	am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### 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	1330	13.57	8085	7.06	6.26	137.4	40.3	6.88	500	cl
2	1340	13.84	7949	7.06	6.07	164.2	11.1	7.42	1000	cl
3	1350	13.88	7878	7.10	6.26	185.6	13.7	7.93	1000	cl
4	1400	13.98	7983	7.07	6.07	204.9	7.81	8.54	1000	cl
5	1410	13.83	7997	7.06	5.29	216.5	7.00	9.07	1000	cl
6	1420	13.68	7934	7.07	4.58	223.1	29.5	9.85	1000	cl
7										
8										
9	0931							7.42	overnight recharge	
10	0936	10.48	7884	7.16	7.51	133.5	14.6	7.83	500	cl

Stabilized: Yes  No

Total Volume Removed: 6000 mL

Comments:

There wasn't enough water in the well to stabilize.



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 103  
Sampling Personal: Darren Nieswaag

Weather Conditions: Temp: 37 °F Wind: SW 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	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	10.38 ft		
Total Well Depth:			
Well Volume:	— liters		
Depth to Top of Pump:	18.41 ft		
Water Level After Sample:	10.43 ft		
Measurement Method:	Electric Water Level Indicator		

### Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	5 sec.
Dedicated Equip?:	Yes	<u>No</u>	Recover:	55 sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	—
Duplicate Sample ID:			Pumping Rate:	100 mL/min
Purge Date:	3 Oct 17		Time Purging Began:	1425 am/pm
Well Purged Dry?:	Yes	<u>No</u>	Time Purged Dry:	— am/pm
Sample Date:	3 Oct 17		Time of Sampling:	1610 am/pm
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### 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	1430	13.04	6255	7.27	185	175.2	7100	10.43	500	Turbid
2	1500	13.72	61664	7.33	0.38	145.1	867	10.43	3000	Slightly turbid
3	1530	13.39	1511	7.31	0.28	147.0	24.0	10.43	3000	Clear
4	1545	13.37	1486	7.31	0.37	146.1	10.2	10.43	1500	Clear
5	1550	13.54	1485	7.32	0.27	145.5	5.91	10.43	500	Clear
6	1555	13.46	1485	7.32	0.26	145.7	5.01	10.43	500	Clear
7	1600	13.72	1481	7.33	0.25	145.0	3.97	10.43	500	Clear
8	1605	13.11	1479	7.33	0.24	144.5	3.71	10.43	500	Clear
9	1610	13.54	1476	7.33	0.23	144.0	3.66	10.43	500	Clear
10										

Stabilized: Yes No

Total Volume Removed: 10,500 mL

Comments:



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

# Field Datasheet

## Groundwater Assessment

Company: MDU Lewis and Clark  
Event: 2017  
Sample ID: MW 109  
Sampling Personal: Darrah Nieswag

Weather Conditions: Temp: 37 °F Wind: SW 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>10.36</u>		ft
Total Well Depth:	<u>—</u>		ft
Well Volume:	<u>—</u>		liters
Depth to Top of Pump:	<u>13.90</u>		ft
Water Level After Sample:	<u>10.41</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?:	Yes	<u>No</u>	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate: <u>100</u> mL/min	
Purge Date:	<u>3 Oct 17</u>	Time Purging Began:	<u>1315</u>	<u>am/pm</u>
Well Purged Dry?:	Yes	<u>No</u>	Time Purged Dry:	<u>—</u> am/pm
Sample Date:	<u>3 Oct 17</u>	Time of Sampling:	<u>1400</u>	<u>am/pm</u>
Bottle List:	500 mL Nitric	1 Liter Raw		
	500 mL Nitric (filtered)			

### Field Measurements

SEQ #	Stabilization (3 consecutive) Time	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	1320	10.48	1755	7.34	5.36	210.0	16.2	10.39	500	clear
2	1335	11.76	1624	7.33	0.54	201.3	4.80	10.41	1500	clear
3	1340	11.93	1620	7.33	0.41	200.6	3.36	10.41	500	clear
4	1345	11.86	1626	7.32	0.32	200.2	2.65	10.41	500	clear
5	1350	12.03	1631	7.32	0.24	199.7	1.70	10.41	500	clear
6	1355	11.98	1627	7.32	0.23	199.3	1.64	10.41	500	clear
7	1400	12.01	1629	7.32	0.22	199.2	1.68	10.41	500	clear
8										
9										
10										

Stabilized: Yes No  
Comments:

Total Volume Removed: 4500 mL



# MVTL Calibration Worksheet

Site: MDU Lewis and Clark

Technician: Darren Nieswaag

Instrument  
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	20 Oct 17		Time: 0620			
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		20.27	7.02	7.00	6.95-7.05	-21.2
Buffer 10		20.26	10.00	10.00	9.95-10.05	-199.4
<b>Conductivity</b>						Check
Buffer 1413		20.36	1426	1413	±10%	Buffer 5000 4998
<b>ORP</b>						
231 mV @ 25C		20.13	219.7	231.0	±10 mV	
<b>DO</b>						
		14.67	9.50	9.34	Barometric Pressure (mm Hg)	705.2
					mg/L	

Post Site Check			
Time:	1935		
	pH	Temp °C	Reading
Buffer 7		18.93	7.01
<b>Conductivity</b>			
Buffer 1413		19.01	1418

Pre Site Calibration						
Date:	3 Oct 17		Time: 0625			
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		18.09	7.01	7.00	6.95-7.05	-21.7
Buffer 10		18.01	10.00	10.00	9.95-10.05	-198.4
<b>Conductivity</b>						Check
Buffer 1413		17.98	1424	1414	±10%	Buffer 5000 4971
<b>ORP</b>						
231 mV @ 25C		18.08	233.2	231.0	±10 mV	
<b>DO</b>						
		18.29	8.23	8.67	Barometric Pressure (mm Hg)	705.8
					mg/L	

Post Site Check			
Time:	1615		
	pH	Temp °C	Reading
Buffer 7		16.02	7.02
<b>Conductivity</b>			
Buffer 1413		16.00	1466



# Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

## Water Level

Sampling Personnel:

Parren Niswaga

Company:

MDU Lewis and Clark

Well ID	Date	Time	Depth to Water	Comments
MW101	3 Oct 17	0925	8.86	
MW105	3 Oct 17	1322	8.70	
MW106	3 Oct 17	1123	9.51	
MW107	3 Oct 17	0927	4.37	
MW108	3 Oct 17	1009	16.44	
MW116	3 Oct 17	1637	9.87	



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

# Field Datasheet

## Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Lewis and Clark

Well ID	Date	Time	Gauge Reading	Comments
East Scrubber Pond Gauge	3 Oct 17	1435	2.42	
West Scrubber Pond Gauge	3 Oct 17	1436	3.40	
Stream behind Sewage Lagoon	3 Oct 17	<del>1432</del> 1632	-	Couldnt read gauge it was blocked out from the water over time. It was a very low flow.



**CASE NARRATIVE – AMENDED 8 NOV 17 (FIELD DATA)**

**MVTL Lab Reference No/SDG:** 201782-2765  
**Client:** Montana Dakota Utilities  
**Location:** MDU Lewis & Clark  
**Project Identification:** October 2017  
**MVTL Laboratory Identifications:** 17-W4254 through 17-W4264  
**Page 1 of 2**

MDU Sample Identification	MVTL Laboratory #
MW110	17-W4254
MW119	17-W4255
MW210	17-W4256
MW102	17-W4257
MW118	17-W4258
MW111	17-W4259
MW117	17-W4260
MW103	17-W4261
MW109	17-W4262
Dup 1	17-W4263
Field Blank (FB)	17-W4264

**I. RECEIPT**

- All samples were received at the laboratory on 4 Oct 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 0.5°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.



CASE NARRATIVE – AMENDED 8 NOV 17 (FIELD DATA)

MVTl Lab Reference No/SDG: 201782-2765  
Client: Montana Dakota Utilities  
Location: MDU Lewis & Clark  
Project Identification: October 2017  
MVTl Laboratory Identifications: 17-W4254 through 17-W4264  
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.

V. REPORTING

- Per email from Samantha Marshall with MDU dated 21 September 2017, both total and dissolved parameters would be analyzed on samples during the October 2017 round.
- 8 Nov 17: Per email dated 30 Oct 17 from Terri Olson with Barr Engineering, the field data summary was amended to correct for an error on a water level start for MW110.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 8 NOV 17  
Claudette Carroll - MVTL Bismarck Laboratory Manager

## Claudette Carroll

---

**From:** Terri A. Olson <TOlson@barr.com>  
**Sent:** Monday, October 30, 2017 7:51 PM  
**To:** Claudette Carroll  
**Subject:** RE: 201782-2765 MDU L&C.pdf

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

Hi Claudette,

Please have the field sampler check the 'Water Level Start (Ft)' for MW110. Raw data lists 8.94, field data report = 9.84.

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)

resourceful. naturally.



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**From:** Claudette Carroll [mailto:ccarroll@mvtl.com]  
**Sent:** Tuesday, October 24, 2017 12:37 PM  
**To:** Barr Data Management <BarrDM@barr.com>; Jesse Hedlund <jhedlund@mvtl.com>; Julie Crispin <jcrispin@mvtl.com>; Marshall, Samantha <Samantha.Marshall@mdu.com>; Mary Hames <mhames@mvtl.com>; Steve Bowen <sbowen@mvtl.com>; Terri A. Olson <TOlson@barr.com>; Justin Soberaski <JSoberaski@barr.com>  
**Subject:** 201782-2765 MDU L&C.pdf

Hello all,

Please find attached the results for the Oct 2017 sampling done at MDU Lewis & Clark. As per Sam's instructions, the State and CCR results are being reported as one data package, although on two separate report pages. Hard copies of these reports will follow to Sam in the mail and EDDs to follow from our IT department.

Let me know if you have any questions.

Have a terrific rest of your day!  
Claudette

**Quality Control Report**

Lab IDs: 17-W4254 to 17-W4264

Project: MDU Lewis & Clark

Work Order: 201782-2765

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
Boron - Dissolved mg/l	0.40	108	80-120	0.400	17-W4256	0.21	0.59	95	75-125	0.59	0.59	95	0.0	20	-	-	< 0.1
	0.40	110	80-120	2.00	17-W4294	0.66	2.52	93	75-125	2.52	2.58	96	2.4	20	-	-	< 0.1
															-	-	< 0.1
															-	-	< 0.1
Boron - Total mg/l	0.40	110	80-120	0.400	17-W4256	0.24	0.60	90	75-125	0.60	0.61	92	1.7	20	-	-	< 0.1
	0.40	110	80-120	8.00	17-W4262	2.48	10.8	104	75-125	10.8	10.7	103	0.9	20	-	-	< 0.1
				0.400	17-W4264	< 0.1	0.44	110	75-125	0.44	0.43	108	2.3	20	-	-	< 0.1
Calcium - Dissolved mg/l	20.0	104	80-120	100	17W4263q	43.1	142	99	75-125	142	142	99	0.0	20	-	-	< 1
	20.0	108	80-120	100	17W4299q	< 1	102	102	75-125	102	99.9	100	2.1	20	-	-	< 1
Calcium - Total mg/l	20.0	106	80-120	100	17W4219q	99.9	190	90	75-125	190	188	88	1.1	20	-	-	< 1
	20.0	104	80-120	100	17W4263q	41.8	137	95	75-125	137	134	92	2.2	20	-	-	< 1
Chloride mg/l	30.0	90	80-120	30.0	17-W4198	5.8	32.9	90	80-120	32.9	32.9	90	0.0	20	-	-	< 1
	30.0	90	80-120	30.0	17-W4261	24.6	53.6	97	80-120	53.6	52.8	94	1.5	20	-	-	< 1
	30.0	89	80-120												-	-	< 1
	30.0	91	80-120												-	-	< 1
Fluoride mg/l	0.50	102	90-110	0.500	17-W4223	0.48	0.96	96	80-120	0.96	0.97	98	1.0	20	-	-	< 0.1
	0.50	98	90-110	0.500	17-W4224	0.48	0.98	100	80-120	0.98	0.98	100	0.0	20	-	-	< 0.1
	0.50	98	90-110	0.500	17-W4262	0.86	1.33	94	80-120	1.33	1.34	96	0.7	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	-	-	7.7	7.7	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.9	8.0	-	1.3	20	-	-	-
Sulfate mg/l	100	100	80-120	2000	17-W4197	57.6	2240	109	80-120	2240	2040	99	9.3	20	-	-	< 5
	100	91	80-120	200	17-W4255	168	369	100	80-120	369	329	80	11.5	20	-	-	< 5

**Quality Control Report**

Lab IDs: 17-W4254 to 17-W4264

Project: MDU Lewis & Clark

Work Order: 201782-2765

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
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1100	1070	-	2.8	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	< 10	< 10	-	0.0	*	-	-	< 10
	-	-	-	-	-	-	-	-	-	4820	4830	-	0.2	20	-	-	

\* Due to result < 10 mg/L, data reported based on acceptance criteria of Relative % Difference of +/- 3 mg/L.

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

*C. Cantor*

24 OCT 17







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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17
Lab Number: 17-W4255
Work Order #: 82-2765
Account #: 002800
Date Sampled: 2 Oct 17 17:59
Date Received: 4 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW119

Temp at Receipt: 0.5C

Event and Year: October 2017

Table with 6 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH - Field, pH, Temperature - Field, Conductivity - Field, Fluoride, Sulfate, Chloride, Total Dissolved Solids, Calcium - Total, Boron - Total.

\* Holding time exceeded

Approved by:

Claudette K. Carroll

Handwritten initials and date: CC 24 OCT 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 11

## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4257  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 3 Oct 17 9:02  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW102

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	6.99	units	NA	SM 4500 H+ B	3 Oct 17 9:02	JSM
pH	* 7.3	units	0.1	SM4500 H+ B	5 Oct 17 17:00	SVS
Temperature - Field	9.45	Degrees C	NA	SM 2550B	3 Oct 17 9:02	JSM
Conductivity - Field	6523	umhos/cm	1	EPA 120.1	3 Oct 17 9:02	JSM
Fluoride	1.78	mg/l	0.10	SM4500-F-C	5 Oct 17 17:00	SVS
Sulfate	4380	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	56.0	mg/l	1.0	SM4500-Cl-E	11 Oct 17 13:55	RAG
Total Dissolved Solids	7090	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	298	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	24.8	mg/l	0.10	6010D	12 Oct 17 13:20	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 24 OCT 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 St
Bismarck ND 58501

Report Date: 23 Oct 17
Lab Number: 17-W4258
Work Order #: 82-2765
Account #: 002800
Date Sampled: 3 Oct 17 12:42
Date Received: 4 Oct 17 8:00
Sampled By: MVTl Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW118

Temp at Receipt: 0.5C

Event and Year: October 2017

Table with 7 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH - Field, pH, Temperature - Field, Conductivity - Field, Fluoride, Sulfate, Chloride, Total Dissolved Solids, Calcium - Total, Boron - Total.

\* Holding time exceeded

Approved by:

Claudette K. Carroll 24 OCT 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: 6 of 11

## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17  
Lab Number: 17-W4259  
Work Order #: 82-2765  
Account #: 002800  
Date Sampled: 3 Oct 17 11:20  
Date Received: 4 Oct 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW111

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.25	units	NA	SM 4500 H+ B	3 Oct 17 11:20	JSM
pH	* 7.6	units	0.1	SM4500 H+ B	5 Oct 17 17:00	SVS
Temperature - Field	12.0	Degrees C	NA	SM 2550B	3 Oct 17 11:20	JSM
Conductivity - Field	3425	umhos/cm	1	EPA 120.1	3 Oct 17 11:20	JSM
Fluoride	2.42	mg/l	0.10	SM4500-F-C	5 Oct 17 17:00	SVS
Sulfate	1590	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	34.7	mg/l	1.0	SM4500-Cl-E	11 Oct 17 13:55	RAG
Total Dissolved Solids	2600	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	164	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	7.94	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

CC  
24OCT17

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 St  
 Bismarck ND 58501

Report Date: 23 Oct 17  
 Lab Number: 17-W4260  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 3 Oct 17 9:36  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW117

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.16	units	NA	SM 4500 H+ B	3 Oct 17 9:36	JSM
pH	* 7.6	units	0.1	SM4500 H+ B	5 Oct 17 17:00	SVS
Temperature - Field	10.5	Degrees C	NA	SM 2550B	3 Oct 17 9:36	JSM
Conductivity - Field	7884	umhos/cm	1	EPA 120.1	3 Oct 17 9:36	JSM
Fluoride	0.28	mg/l	0.10	SM4500-F-C	5 Oct 17 17:00	SVS
Sulfate	5500	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	46.7	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	8650	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	427	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	10.2	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 24 OCT 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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 www.mvtl.com



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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4261  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 3 Oct 17 16:10  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW103

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.33	units	NA	SM 4500 H+ B	3 Oct 17 16:10	JSM
pH	* 7.7	units	0.1	SM4500 H+ B	5 Oct 17 17:00	SVS
Temperature - Field	13.5	Degrees C	NA	SM 2550B	3 Oct 17 16:10	JSM
Conductivity - Field	1476	umhos/cm	1	EPA 120.1	3 Oct 17 16:10	JSM
Fluoride	0.87	mg/l	0.10	SM4500-F-C	5 Oct 17 17:00	SVS
Sulfate	353	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	24.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	985	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	89.7	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	1.90	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 24OCT17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4262  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 3 Oct 17 14:00  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW109

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.32	units	NA	SM 4500 H+ B	3 Oct 17 14:00	JSM
pH	* 7.7	units	0.1	SM4500 H+ B	5 Oct 17 18:00	SVS
Temperature - Field	12.0	Degrees C	NA	SM 2550B	3 Oct 17 14:00	JSM
Conductivity - Field	1629	umhos/cm	1	EPA 120.1	3 Oct 17 14:00	JSM
Fluoride	0.86	mg/l	0.10	SM4500-F-C	5 Oct 17 18:00	SVS
Sulfate	462	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	23.8	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	1100	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	96.3	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	2.48	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by: Claudette K. Carroll <sup>CC</sup> 24 OCT 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - CCR

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

Report Date: 23 Oct 17  
Lab Number: 17-W4264  
Work Order #: 82-2765  
Account #: 002800  
Date Sampled: 3 Oct 17  
Date Received: 4 Oct 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: Field Blank

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH	* 6.7	units	0.1	SM4500 H+ B	5 Oct 17 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	5 Oct 17 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	10 Oct 17 15:06	RAG
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	< 10	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	< 1	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 24 OCT 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:

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CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4254  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 2 Oct 17 16:36  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW110

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.32	units	NA	SM 4500 H+ B	2 Oct 17 16:36	JSM
Temperature - Field	13.1	Degrees C	NA	SM 2550B	2 Oct 17 16:36	JSM
Conductivity - Field	1109	umhos/cm	1	EPA 120.1	2 Oct 17 16:36	JSM
Calcium - Dissolved	89.5	mg/l	1.0	6010D	23 Oct 17 14:40	SZ
Boron - Dissolved	0.26	mg/l	0.10	6010D	13 Oct 17 11:23	SZ

\* Holding time exceeded

Approved by: Claudette K. Carroll <sup>CC</sup> 24 OCT 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4256  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 2 Oct 17 19:30  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW210

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.59	units	NA	SM 4500 H+ B	2 Oct 17 19:30	JSM
Temperature - Field	10.9	Degrees C	NA	SM 2550B	2 Oct 17 19:30	JSM
Conductivity - Field	1447	umhos/cm	1	EPA 120.1	2 Oct 17 19:30	JSM
Calcium - Dissolved	45.6	mg/l	1.0	6010D	23 Oct 17 14:40	SZ
Boron - Dissolved	0.21	mg/l	0.10	6010D	13 Oct 17 11:23	SZ

\* Holding time exceeded

Approved by:

Claudette K. Carroll <sup>CC</sup> 24 OCT 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
 Lab Number: 17-W4257  
 Work Order #: 82-2765  
 Account #: 002800  
 Date Sampled: 3 Oct 17 9:02  
 Date Received: 4 Oct 17 8:00  
 Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW102

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	6.99	units	NA	SM 4500 H+ B	3 Oct 17 9:02	JSM
Temperature - Field	9.45	Degrees C	NA	SM 2550B	3 Oct 17 9:02	JSM
Conductivity - Field	6523	umhos/cm	1	EPA 120.1	3 Oct 17 9:02	JSM
Calcium - Dissolved	306	mg/l	1.0	6010D	23 Oct 17 14:40	SZ
Boron - Dissolved	24.0	mg/l	0.10	6010D	13 Oct 17 11:23	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll* <sup>CC</sup> 24 OCT 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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CERTIFICATION: ND # ND-00016



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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
Lab Number: 17-W4258  
Work Order #: 82-2765  
Account #: 002800  
Date Sampled: 3 Oct 17 12:42  
Date Received: 4 Oct 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW118

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.46	units	NA	SM 4500 H+ B	3 Oct 17 12:42	JSM
Temperature - Field	12.2	Degrees C	NA	SM 2550B	3 Oct 17 12:42	JSM
Conductivity - Field	1617	umhos/cm	1	EPA 120.1	3 Oct 17 12:42	JSM
Calcium - Dissolved	82.2	mg/l	1.0	6010D	23 Oct 17 14:40	SZ
Boron - Dissolved	2.00	mg/l	0.10	6010D	13 Oct 17 12:23	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*CC  
24 OCT 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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

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CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
Lab Number: 17-W4259  
Work Order #: 82-2765  
Account #: 002800  
Date Sampled: 3 Oct 17 11:20  
Date Received: 4 Oct 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

Sample Description: MW111

PO #: 165273 OP

Event and Year: October 2017

Temp at Receipt: 0.5C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
pH - Field	7.25	units	NA	SM 4500 H+ B	3 Oct 17 11:20	JSM
Temperature - Field	12.0	Degrees C	NA	SM 2550B	3 Oct 17 11:20	JSM
Conductivity - Field	3425	umhos/cm	1	EPA 120.1	3 Oct 17 11:20	JSM
Calcium - Dissolved	169	mg/l	1.0	6010D	23 Oct 17 14:40	SZ
Boron - Dissolved	7.73	mg/l	0.10	6010D	13 Oct 17 12:23	SZ

\* Holding time exceeded

Approved by:

Claudette K. Carroll

24 OCT 17

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

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# = 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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CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17
Lab Number: 17-W4262
Work Order #: 82-2765
Account #: 002800
Date Sampled: 3 Oct 17 14:00
Date Received: 4 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: MW109

Temp at Receipt: 0.5C

Event and Year: October 2017

Table with 7 columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include Metal Digestion, pH - Field, Temperature - Field, Conductivity - Field, Calcium - Dissolved, Boron - Dissolved.

\* Holding time exceeded

Approved by:

Claudette K. Carroll

LC 24 OCT 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:

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

CERTIFICATION: ND # ND-00016





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## CERTIFICATE of ANALYSIS - STATE

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

Report Date: 23 Oct 17  
Lab Number: 17-W4264  
Work Order #: 82-2765  
Account #: 002800  
Date Sampled: 3 Oct 17  
Date Received: 4 Oct 17 8:00  
Sampled By: MVTL Field Services

Project Name: MDU Lewis & Clark

PO #: 165273 OP

Sample Description: Field Blank

Temp at Receipt: 0.5C

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 17	SVS
Calcium - Dissolved	< 1	mg/l	1.0	6010D	23 Oct 17 15:50	SZ
Boron - Dissolved	< 0.1	mg/l	0.10	6010D	13 Oct 17 12:23	SZ

\* Holding time exceeded

Approved by:

*Claudette K. Carroll*

*cc*  
*24 OCT 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:

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

CERTIFICATION: ND # ND-00016



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

# Chain of Custody Record

<b>Project Name:</b> MDU Lewis and Clark	<b>Event:</b> October 2017	<b>Work Order Number:</b> 82-2765
<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 Nieswaag

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	
W4254	MW110	2 Oct 17	1636	GW	X	X	X	13.07	1109	7.32	MDU Apendix III
W4255	MW119	2 Oct 17	1759	GW	X	X	X	13.58	1172	7.30	
W4256	MW210	2 Oct 17	1930	GW	X	X	X	10.90	1447	7.59	
W4257	MW102	3 Oct 17	0902	GW	X	X	X	9.45	6523	6.99	
W4258	MW118	3 Oct 17	1242	GW	X	X	X	12.25	1617	7.46	
W4259	MW111	3 Oct 17	1120	GW	X	X	X	12.05	3425	7.25	
W4260	MW117	3 Oct 17	0936	GW	X	X	X	10.48	7884	7.16	
W4261	MW103	3 Oct 17	1610	GW	X	X	X	13.54	1476	7.33	
W4262	MW109	3 Oct 17	1400	GW	X	X	X	12.01	1629	7.32	
W4263	Dup 1	2 Oct 17	NA	GW	X	X	X	1 NA	NA	NA	
W4264	Field Blank (FB)	3 Oct 17	NA	W	X	X	X	NA	NA	NA	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswaag</i>	4 Oct 17 0730	Log In Walk In #2	0.5 T/M562 / T/M588
2			

Received by:	
Name:	Date/Time
<i>Darren Nieswaag</i>	4 Oct 2017 0800