



Sample Analysis Report

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

Date Reported 9/29/2016
Report ID S1609036001

ProjectName: 201682-2728
Lab ID: S1609036-004
ClientSample ID: 16-W3838 MW101
COC: 201682-2728

WorkOrder: S1609036
CollectionDate: 8/30/2016 11:43:00 AM
DateReceived: 9/2/2016 10:58:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.7	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
Radium 228	-1.2	pCi/L		1	Ga-Tech	09/18/2016 2020	MB
Radium 228 Precision (±)	3.5	pCi/L			Ga-Tech	09/18/2016 2020	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 9/29/2016
Report ID S1609036001

ProjectName: 201682-2728
Lab ID: S1609036-005
ClientSample ID: 16-W3839 MW33
COC: 201682-2728

WorkOrder: S1609036
CollectionDate: 8/30/2016 1:53:00 PM
DateReceived: 9/2/2016 10:58:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.4	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
Radium 228	-3.7	pCi/L		1	Ga-Tech	09/18/2016 2321	MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	09/18/2016 2321	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 9/29/2016
Report ID S1609036001

ProjectName: 201682-2728
Lab ID: S1609036-006
ClientSample ID: 16-W3840 MW3-90
COC: 201682-2728

WorkOrder: S1609036
CollectionDate: 8/30/2016 3:15:00 PM
DateReceived: 9/2/2016 10:58:00 AM
FieldSampler:
Matrix: Water

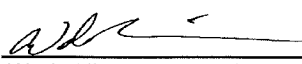
Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1200	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
Radium 228	-5.7	pCi/L		1	Ga-Tech	09/22/2016 852	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/22/2016 852	MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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



Sample Analysis Report

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

Date Reported 9/29/2016
Report ID S1609036001

ProjectName: 201682-2728
Lab ID: S1609036-007
ClientSample ID: 16-W3841 MW2-90
COC: 201682-2728

WorkOrder: S1609036
CollectionDate: 8/30/2016 4:37:00 PM
DateReceived: 9/2/2016 10:58:00 AM
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	09/14/2016 1200	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1200	MB
Radium 228	-1.9	pCi/L		1	Ga-Tech	09/19/2016 223	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/19/2016 223	MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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



ANALYTICAL QC SUMMARY REPORT

CLIENT: MVTL Laboratories, Inc.
 Work Order: S1609036
 Project: 201682-2728

Date: 9/29/2016
 Report ID: S1609036001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-384 (09/16/16 17:01)	Analyte	RunNo:	138877	PrepDate:	09/07/16 12:00	BatchID:	12303		
		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-384 (09/16/16 20:02)	Analyte	RunNo:	138877	PrepDate:	09/07/16 12:00	BatchID:	12303		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		37	1	38.5		96.0	61.3 - 120		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-384 (09/17/16 02:04)	Analyte	RunNo:	138877	PrepDate:	09/07/16 12:00	BatchID:	12303		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		46	1	38.5	ND	119	64.3 - 120		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-384 (09/17/16 05:05)	Analyte	RunNo:	138877	PrepDate:	09/07/16 12:00	BatchID:	12303		
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		42	1	46	8.12	110	20		

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MBLK		Units: pCi/L				
MB-1660 (09/14/16 09:51)	Analyte	RunNo:	138729	PrepDate:	09/07/16 0:00	BatchID:	12295		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		ND	0.2						

Radium 226 in Water - Total by SM7500RA_B		Sample Type	LCS		Units: pCi/L				
LCS-1660 (09/14/16 09:51)	Analyte	RunNo:	138729	PrepDate:	09/07/16 0:00	BatchID:	12295		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.3	0.2	5.99		88.4	67.1 - 122		

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MS		Units: pCi/L				
S1608482-001AMS (09/14/16 09:51)	Analyte	RunNo:	138729	PrepDate:	09/07/16 0:00	BatchID:	12295		
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		10.1	0.2	12	0.3	81.5	65 - 131		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery 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

201682-2728

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: 8/31/2016
	Project Name/Number:	Purchase Order #: BL5655

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
51609036-001	16-W3835	Dup 2		8/30/2016								Ra226 & Ra228 on all
002	16-W3836	Field Blank		8/30/2016								
003	16-W3837	MW70		8/30/2016	850							
004	16-W3838	MW101		8/30/2016	1143							
005	16-W3839	MW33		8/30/2016	1353							
006	16-W3840	MW3-90		8/30/2016	1515							
007	16-W3841	MW2-90		8/30/2016	1637							

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

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
C. Jackson	08/31/16	1700		<i>[Signature]</i>	9/2/16	22.0
2.					10:58	26.0



Laboratories, Inc.

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

Chain of Custody Record

Project Name: MDU Heskett CCR Radiochem August 2016				Name of Sampler(s): Darren Nieswang			
Report To: MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829				Carbon Copy: Attn: Address:			
				Work Order Number: 82-2728			

Sample Information				Bottle Type				Field Parameters			Analysis		
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO ₃				Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
w3835	Dup 2	30 Aug 16	NA	W		4				NA	NA	NA	MDU CCR Numerical RadChem
w3836	Field Blank (FB)	30 Aug 16	NA	W		4				NA	NA	NA	
w3837	MW 70	30 Aug 16	0850	GW		4				9.54	4136	6.90	
w3838	MW 101	30 Aug 16	1143	GW		4				14.11	4968	6.67	
w3839	MW 33	30 Aug 16	1353	GW		4				13.67	5298	6.45	
w3840	MW 3-90	30 Aug 16	1515	GW		4				13.89	5222	6.80	
w3841	MW 2-90	30 Aug 16	1637	GW		4				11.62	7676	6.86	

Comments:

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	Darren Nieswang	walkin 2	30 Aug 16 1845	C. Jackson		31 Aug 16 0800	ROU 6.2
2							TM 588
3							30 Aug 16 1845

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Darren Nilsvaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 29 Aug 16 Time: 0731

	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7		<u>22.73</u>	<u>6.92</u>	<u>7.00</u>	6.95-7.05	<u>-39.2</u>	0 +/- 50
Buffer 10		<u>22.75</u>	<u>10.03</u>	<u>10.00</u>	9.95-10.05	<u>-218.0</u>	-180 +/- 50
Conductivity							Check
Buffer 10000 <i>ICA</i>		<u>22.88</u>	<u>10202</u>	<u>9999</u>	±10%	Buffer 5000 <i>ICA</i>	<u>4979</u>
ORP							
231 mV @ 25C		<u>5.35</u>	<u>264.1</u>	<u>257.6</u>	±10 mV		
DO							
		<u>22.18</u>	<u>10.61</u>	<u>8.20</u>	Barometric Pressure (mm Hg)	<u>721.0</u>	
					mg/L		

Post Site Check

Time: 1647

	pH	Temp °C	Reading
Buffer 7		<u>23.92</u>	<u>7.03</u>
Conductivity			
Buffer 5000		<u>23.04</u>	<u>5079</u>

Pre Site Calibration

Date: 30 Aug 16 Time: 0733

	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7		<u>21.91</u>	<u>7.02</u>	<u>7.00</u>	6.95-7.05	<u>-40.4</u>	0 +/- 50
Buffer 10		<u>21.97</u>	<u>10.01</u>	<u>10.00</u>	9.95-10.05	<u>-219.3</u>	-180 +/- 50
Conductivity							Check
Buffer 10000		<u>22.12</u>	<u>10149</u>	<u>10001</u>	±10%	Buffer 5000	<u>4955</u>
ORP							
231 mV @ 25C		<u>4.65</u>	<u>259.4</u>	<u>257.3</u>	±10 mV		
DO							
		<u>21.87</u>	<u>8.10</u>	<u>8.34</u>	Barometric Pressure (mm Hg)	<u>723.0</u>	
					mg/L		

Post Site Check

Time: 1839

	pH	Temp °C	Reading
Buffer 7		<u>23.82</u>	<u>6.99</u>
Conductivity			
Buffer 5000		<u>23.71</u>	<u>5106</u>



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett
 Event: August 2016
 Sample ID: MW101
 Sampling Personal: Darren Nieswanger
 Date: 30 Aug 16

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									
11	1133	14.39	4965	6.66	1.29	0.8	4.91	40.58	500	clear
12	1138	14.20	4973	6.66	1.22	-0.3	4.75	40.65	500	clear
13	1143	14.11	4968	6.67	1.23	0.5	4.88	40.69	500	clear
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Stabilized: Yes No
 Comments:

Total Volume Removed: 11,000 mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: August 2016
Sample ID: MW33
Sampling Personal: Darion Niswag

Weather Conditions: Temp: 79 °F Wind: 55 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes	No	
Well Labeled?	Yes	No	
Casing Straight?	Yes	No	
Grout Seal Intact?	Yes	No	<u>Not Visible</u>
Repairs Necessary:	<u>✓</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>42.08</u>	ft	
Total Well Depth:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>N 42.03</u>	<u>44.52</u>	ft
Water Level After Sample:	<u>42.73</u>	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<u>1844</u> sec.
Dedicated Equip?:	Yes	No	Recover:	<u>56</u> sec.
Duplicate Sample?:	Yes	No	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>30 Aug 16</u>	Time Purging Began:	<u>1253</u>	am/pm
Well Purged Dry?	Yes	No	Time Purged Dry:	<u>—</u> am/pm
Sample Date:	<u>30 Aug 16</u>	Time of Sampling:	<u>1353</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	1308	13.43	5300	6.51	2.10	-51.5	25.4	42.29	500	clear
3	1318	13.78	5275	6.47	1.95	-32.7	16.0	42.32	1000	clear
4	1328	14.16	5273	6.48	1.92	-23.7	7.61	42.36	1000	clear
5	1333	13.99	5279	6.48	1.87	-21.8	3.31	42.38	500	clear
6	1338	13.73	5290	6.48	1.90	-21.2	2.65	42.43	500	clear
7	1343	14.00	5278	6.48	1.80	-20.5	1.78	42.43	500	clear
8	1348	13.83	5281	6.48	1.67	-20.0	1.77	42.50	500	clear
9	1353	13.67	5298	6.45	1.69	-22.6	1.69	42.50	500	clear
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 Heskett
Event: August 2016
Sample ID: MW 2-90
Sampling Personal: Darren Nieswamy

Weather Conditions: Temp: 80 °F Wind: SE 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"/>	<u>Not Visible</u>
Repairs Necessary:	<u>-</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>21.58</u>	ft	
Total Well Depth:	<u>-</u>	ft	
Well Volume:	<u>-</u>	liters	
Depth to Top of Pump:	<u>22.60</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>4</u> sec.
Dedicated Equip?:	<u>Yes</u>	No <input type="checkbox"/>	Recover:	<u>56</u> sec.
Duplicate Sample?:	<u>Yes</u>	No <input type="checkbox"/>	PSI:	<u>-</u>
Duplicate Sample ID:	<u>Dup-2</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>30 Aug 16</u>	Time Purging Began:	<u>1617</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>30 Aug 16</u>	Time of Sampling:	<u>1637</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	1627	11.55	7719	6.87	3.90	-1.9	0.50	21.92	500	<u>clear</u>
3	1632	11.54	7694	6.87	3.68	10.6	0.58	21.92	500	<u>clear</u>
4	1637	11.62	7676	6.86	3.83	16.3	0.53	21.92	500	<u>clear</u>
5										
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments: -

Total Volume Removed: 2000 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



October 21, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

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

Sincerely,

Jeremy Meyer
MVTL Field Services



MVTL Laboratories Inc.
FIELD DATA REPORT

WO# 82-2728 82-2749 82-2696
82-2724 82-2748 82-2694

MDU Heskett
GROUNDWATER SAMPLING - NDDH
Attn: Samantha Marshall
400 N. 4th St
Bismarck, ND 58501
701-222-7829

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	pH	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
2	NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA	NA	31-Aug-16	14:01	1662.80	1645.10	17.70	26.15	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA	NA	31-Aug-16	13:59	1664.90	1647.87	17.03	28.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only



CASE NARRATIVE

MVTl Lab Reference No/SDG: 201682-2748
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR August 2016
MVTl Laboratory Identifications: 16-W3866 through 16-W3869
Page 1 of 2

Table with 2 columns: MDU Sample Identification, MVTL Laboratory #. Rows include Field Blank (FB), MW104, MW80R, MW105.

I. RECEIPT

- All samples were received at the laboratory on 31 Aug 2016 at 1447.
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 3.8°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).
For some metals, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201682-2748
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR August 2016
MVTL Laboratory Identifications: 16-W3866 through 16-W3869
Page 2 of 2

- The recoveries for two selenium matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. High recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- One selenium 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.
- 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.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 16 Sept 16
Claudette Carroll - MVTL Bismarck Laboratory Manager



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Page: 1 of 2

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

Report Date: 15 Sep 16
Lab Number: 16-W3866
Work Order #:82-2748
Account #: 002800
Date Sampled: 31 Aug 16
Date Received: 31 Aug 16 14:47
Sampled By: MVTl Field Services

Project Name: MDU Heskett CCR GR August 2016
Sample Description: Field Blank (FB)

Temp at Receipt: 3.8C ROI

Table with columns: As Received Result, Method RL, Method Reference, Date Analyzed, Analyst. Rows include various chemical tests like pH, Total Suspended Solids, Fluoride, Sulfate, Chloride, Mercury, 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: 15 Sep 16
Lab Number: 16-W3866
Work Order #: 82-2748
Account #: 002800
Date Sampled: 31 Aug 16
Date Received: 31 Aug 16 14:47
Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
Sample Description: Field Blank (FB)

Temp at Receipt: 3.8C ROI

	As Received Result	Method	Method Reference	Date Analyzed	Analyst
Chromium - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/l	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/l	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	< 0.005 ^ mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l	0.0005	6020	15 Sep 16 15:19	CC

* Holding time exceeded

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

Approved by: Claudette K. Carroll *CC 16 Sep 16*

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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Page: 1 of 2

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

Report Date: 15 Sep 16
 Lab Number: 16-W3867
 Work Order #: 82-2748
 Account #: 002800
 Date Sampled: 31 Aug 16 9:00
 Date Received: 31 Aug 16 14:47
 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
 Sample Description: MW104

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	31 Aug 16	ML
pH	* 6.9	units	N/A	SM4500 H+ B	31 Aug 16 17:00	ML
Total Suspended Solids	10	mg/l	1	I3765-85	1 Sep 16 16:20	ML
pH - Field	6.88	units	NA	SM 4500 H+ B	31 Aug 16 9:00	DJN
Temperature - Field	12.4	Degrees C	NA	SM 2550B	31 Aug 16 9:00	DJN
Total Alkalinity	562	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	14048	umhos/cm	1	EPA 120.1	31 Aug 16 9:00	DJN
Fluoride	0.49	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	10500	mg/l	5.00	ASTM D516-07	2 Sep 16 10:33	EMS
Chloride	99.6	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	14600	mg/l	5	I1750-85	1 Sep 16 15:50	ML
Calcium - Total	441	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Magnesium - Total	1620	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Sodium - Total	2100	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Potassium - Total	37.8	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Lithium - Total	2.92	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	1.03	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	467	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	1670	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	2180	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	35.6	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	2.66	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.98	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0087	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	0.0021	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.1752	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

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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: 15 Sep 16
Lab Number: 16-W3867
Work Order #: 82-2748
Account #: 002800
Date Sampled: 31 Aug 16 9:00
Date Received: 31 Aug 16 14:47
Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
Sample Description: MW104

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0079 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	0.0021 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	0.1612 mg/l		0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l		0.0005	6020	15 Sep 16 15:19	CC

* Holding time exceeded

Approved by:

Claudette K. Carroll

*CC
16 Sep 16*

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: 15 Sep 16
 Lab Number: 16-W3868
 Work Order #: 82-2748
 Account #: 002800
 Date Sampled: 31 Aug 16 10:24
 Date Received: 31 Aug 16 14:47
 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
 Sample Description: MW80R

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion						
pH	* 7.1	units	N/A	EPA 200.2	31 Aug 16	ML
Total Suspended Solids	7	mg/l	1	SM4500 H+ B	31 Aug 16 17:00	ML
pH - Field	7.01	units	NA	SM 4500 H+ B	1 Sep 16 16:20	ML
Temperature - Field	12.6	Degrees C	NA	SM 2550B	31 Aug 16 10:24	DJN
Total Alkalinity	537	mg/l CaCO3	20	SM2320-B	31 Aug 16 17:00	ML
Conductivity - Field	5734	umhos/cm	1	EPA 120.1	31 Aug 16 10:24	DJN
Fluoride	0.30	mg/l	0.10	SM4500-F-C	31 Aug 16 17:00	ML
Sulfate	2950	mg/l	5.00	ASTM D516-07	2 Sep 16 10:33	EMS
Chloride	181	mg/l	1.0	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	13 Sep 16 13:06	EV
Total Dissolved Solids	5120	mg/l	5	I1750-85	1 Sep 16 15:50	ML
Calcium - Total	284	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Magnesium - Total	570	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Sodium - Total	595	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Potassium - Total	< 5 @	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Lithium - Total	1.11	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	0.39	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	302	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	595	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	645	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	4.0	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	0.94	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.36	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0140	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	0.0039	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.0617	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

RL = Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016



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

Report Date: 15 Sep 16
Lab Number: 16-W3868
Work Order #: 82-2748
Account #: 002800
Date Sampled: 31 Aug 16 10:24
Date Received: 31 Aug 16 14:47
Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
Sample Description: MW80R

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0109 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005 mg/l		0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	0.0031 mg/l		0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	0.0589 mg/l		0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005 mg/l		0.0005	6020	15 Sep 16 15:19	CC

* Holding time exceeded

Approved by:

Claudette K. Carroll

*CC
16 Sep 16*

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: 15 Sep 16
 Lab Number: 16-W3869
 Work Order #: 82-2748
 Account #: 002800
 Date Sampled: 31 Aug 16 12:44
 Date Received: 31 Aug 16 14:47
 Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
 Sample Description: MW105

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion						
pH	* 6.7	units	N/A	EPA 200.2	31 Aug 16	ML
Total Suspended Solids	15	mg/l	1	SM4500 H+ B	31 Aug 16 17:00	ML
pH - Field	6.64	units	NA	I3765-85	1 Sep 16 16:20	ML
Temperature - Field	13.1	Degrees C	NA	SM 4500 H+ B	31 Aug 16 12:44	DJN
Total Alkalinity	449	mg/l CaCO3	20	SM 2550B	31 Aug 16 12:44	DJN
Conductivity - Field	7590	umhos/cm	1	SM2320-B	31 Aug 16 17:00	ML
Fluoride	0.25	mg/l	0.10	EPA 120.1	31 Aug 16 12:44	DJN
Sulfate	4550	mg/l	5.00	SM4500-F-C	31 Aug 16 17:00	ML
Chloride	425	mg/l	1.0	ASTM D516-07	2 Sep 16 10:33	EMS
Mercury - Total	< 0.0002	mg/l	0.0002	SM4500-Cl-E	1 Sep 16 11:50	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	9 Sep 16 11:30	EV
Total Dissolved Solids	7190	mg/l	5	EPA 245.1	13 Sep 16 13:06	EV
Calcium - Total	408	mg/l	1.0	I1750-85	1 Sep 16 15:50	ML
Magnesium - Total	830	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Sodium - Total	800	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Potassium - Total	20.1	mg/l	1.0	6010	2 Sep 16 17:39	SZ
Lithium - Total	1.47	mg/l	0.10	6010	7 Sep 16 9:47	KMD
Boron - Total	0.41	mg/l	0.10	6010	6 Sep 16 14:12	KMD
Calcium - Dissolved	445	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Magnesium - Dissolved	880	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Sodium - Dissolved	885	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Potassium - Dissolved	20.5	mg/l	1.0	6010	12 Sep 16 13:23	KMD
Lithium - Dissolved	1.39	mg/l	0.10	6010	7 Sep 16 10:47	KMD
Boron - Dissolved	0.39	mg/l	0.10	6010	6 Sep 16 15:12	KMD
Antimony - Total	< 0.001	mg/l	0.0010	6020	14 Sep 16 14:15	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Barium - Total	0.0240	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Beryllium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Cadmium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Chromium - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Lead - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Molybdenum - Total	< 0.002	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Selenium - Total	0.0036	mg/l	0.0020	6020	14 Sep 16 14:15	CC
Thallium - Total	< 0.0005	mg/l	0.0005	6020	14 Sep 16 14:15	CC
Antimony - Dissolved	< 0.001	mg/l	0.0010	6020	14 Sep 16 19:37	CC
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC

RL = Method Reporting Limit

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

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

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: 15 Sep 16
Lab Number: 16-W3869
Work Order #: 82-2748
Account #: 002800
Date Sampled: 31 Aug 16 12:44
Date Received: 31 Aug 16 14:47
Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR GR August 2016
Sample Description: MW105

Temp at Receipt: 3.8C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Barium - Dissolved	0.0171	mg/l	0.0020	6020	14 Sep 16 19:37	CC
Beryllium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Sep 16 19:37	CC
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Sep 16 19:37	CC
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC
Cobalt - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020	14 Sep 16 19:37	CC
Molybdenum - Dissolved	< 0.002	mg/l	0.0020	6020	14 Sep 16 19:37	CC
Selenium - Dissolved	< 0.005 ^	mg/l	0.0020	6020	15 Sep 16 15:19	CC
Thallium - Dissolved	< 0.0005	mg/l	0.0005	6020	15 Sep 16 15:19	CC

* Holding time exceeded

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

Approved by:

Claudette K. Carroll

*CC
16 Sep 16*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

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Quality Control Report

Lab IDs: 16-W3866 to 16-W3869

Project: MDU Heskett CCR GR August 2016

Work Order: 201682-2748

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	110	80-120	0.100	16-W3869	< 0.001	0.1084	108	75-125	0.1084	0.1138	114	4.9	20	-	-	< 0.001
Antimony - Total mg/l	0.1000	104	80-120	0.400	16W3855q	< 0.001	0.4272	107	75-125	0.4272	0.4114	103	3.8	20	-	-	< 0.001
				0.400	16W3874q	< 0.001	0.4506	113	75-125	0.4506	0.4456	111	1.1	20	-	-	
				0.400	16W3898q	< 0.001	0.4428	111	75-125	0.4428	0.4556	114	2.8	20	-	-	
Arsenic - Dissolved mg/l	0.1000	110	80-120	0.100	16-W3869	< 0.002	0.1165	116	75-125	0.1165	0.1212	121	4.0	20	-	-	< 0.002
Arsenic - Total mg/l	0.1000	104	80-120	0.400	16W3855q	0.0032	0.4442	110	75-125	0.4442	0.4186	104	5.9	20	-	-	< 0.002
				0.400	16W3874q	0.0064	0.4668	115	75-125	0.4668	0.4570	113	2.1	20	-	-	
				0.400	16W3898q	0.0028	0.4684	116	75-125	0.4684	0.4740	118	1.2	20	-	-	
Barium - Dissolved mg/l	0.1000	102	80-120	0.100	16-W3869	0.0171	0.1272	110	75-125	0.1272	0.1258	109	1.1	20	-	-	< 0.002
Barium - Total mg/l	0.1000	105	80-120	0.400	16W3855q	0.0702	0.4890	105	75-125	0.4890	0.4828	103	1.3	20	-	-	< 0.002
				0.400	16W3874q	0.0482	0.4812	108	75-125	0.4812	0.4888	110	1.6	20	-	-	
				0.400	16W3898q	0.0304	0.4766	112	75-125	0.4766	0.4784	112	0.4	20	-	-	
Beryllium - Dissolved mg/l	0.1000	112	80-120	0.100	16-W3869	< 0.0005	0.1179	118	75-125	0.1179	0.1197	120	1.5	20	-	-	< 0.0005
Beryllium - Total mg/l	0.1000	106	80-120	0.400	16W3855q	< 0.0005	0.5018	125	75-125	0.5018	0.4690	117	6.8	20	-	-	< 0.0005
				0.400	16W3874q	< 0.0005	0.5008	125	75-125	0.5008	0.4878	122	2.6	20	-	-	
										0.4986	0.5002		0.3	20	-	-	
Boron - Dissolved mg/l	0.40	110	80-120	0.600	16-W3869	0.39	0.96	95	75-125	0.96	0.96	95	0.0	20	-	-	< 0.1
															-	-	< 0.1
Boron - Total mg/l	0.40	102	80-120	0.400	16-D3542	1.51	1.92	102	75-125	1.92	1.99	120	3.6	20	-	-	< 0.1
				0.400	16-W3786	0.21	0.58	92	75-125	0.58	0.59	95	1.7	20	-	-	< 0.1
				0.400	16-W3829	0.42	0.78	90	75-125	0.78	0.80	95	2.5	20	-	-	< 0.1
				0.400	16-W3855	0.26	0.66	100	75-125	0.66	0.69	108	4.4	20	-	-	
Cadmium - Dissolved mg/l	0.1000	114	80-120	0.100	16-W3869	< 0.0005	0.1046	105	75-125	0.1046	0.1098	110	4.9	20	-	-	< 0.0005
Cadmium - Total mg/l	0.1000	109	80-120	0.400	16W3855q	< 0.0005	0.4452	111	75-125	0.4452	0.4246	106	4.7	20	-	-	< 0.0005
				0.400	16W3874q	< 0.0005	0.4612	115	75-125	0.4612	0.4690	117	1.7	20	-	-	
				0.400	16W3898q	< 0.0005	0.4532	113	75-125	0.4532	0.4518	113	0.3	20	-	-	



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Quality Control Report

Lab IDs: 16-W3866 to 16-W3869

Project: MDU Heskett CCR GR August 2016

Work Order: 201682-2748

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Calcium - Dissolved mg/l	20.0	108	80-120	500	16-W3827	505	1040	107	75-125	1040	1020	103	1.9	20	-	-	< 1
	20.0	106	80-120	500	16-W3869	445	1020	115	75-125	1020	995	110	2.5	20	-	-	< 1
															-	-	< 1
															-	-	< 1
Calcium - Total mg/l	20.0	102	80-120	500	16W3829q	358	800	88	75-125	800	800	88	0.0	20	-	-	< 1
	20.0	114	80-120	100	16W3859q	17.8	121	103	75-125	121	121	103	0.0	20	-	-	< 1
				100	16W3885q	60.9	155	94	75-125	155	158	97	1.9	20	-	-	< 1
Chloride mg/l	30.0	101	80-120	30.0	16-W3827	84.1	112	93	80-120	112	113	96	0.9	20	-	-	< 1
															-	-	< 1
															-	-	< 1
Chromium - Dissolved mg/l	0.1000	103	80-120	0.100	16-W3869	< 0.002	0.1106	111	75-125	0.1106	0.1155	116	4.3	20	-	-	< 0.002
Chromium - Total mg/l	0.1000	97	80-120	0.400	16W3855q	< 0.002	0.4026	101	75-125	0.4026	0.3860	96	4.2	20	-	-	< 0.002
				0.400	16W3874q	< 0.002	0.4136	103	75-125	0.4136	0.4100	102	0.9	20	-	-	< 0.002
				0.400	16W3898q	< 0.002	0.4216	105	75-125	0.4216	0.4282	107	1.6	20	-	-	< 0.002
Cobalt - Dissolved mg/l	0.1000	102	80-120	0.100	16-W3869	< 0.002	0.1080	108	75-125	0.1080	0.1132	113	4.7	20	-	-	< 0.002
Cobalt - Total mg/l	0.1000	99	80-120	0.400	16W3855q	< 0.002	0.4172	104	75-125	0.4172	0.3900	98	6.7	20	-	-	< 0.002
				0.400	16W3874q	< 0.002	0.4188	105	75-125	0.4188	0.4096	102	2.2	20	-	-	< 0.002
				0.400	16W3898q	< 0.002	0.4166	104	75-125	0.4166	0.4290	107	2.9	20	-	-	< 0.002
Fluoride mg/l	0.50	100	90-110	0.500	16-D3564	2.46	2.90	88	80-120	2.90	2.93	94	1.0	20	-	-	< 0.1
				0.500	16-W3869	0.25	0.66	82	80-120	0.66	0.67	84	1.5	20	-	-	< 0.1
Lead - Dissolved mg/l	0.1000	105	80-120	0.100	16-W3869	< 0.0005	0.1012	101	75-125	0.1012	0.1014	101	0.2	20	-	-	< 0.0005
Lead - Total mg/l	0.1000	101	80-120	0.400	16W3855q	0.0006	0.4066	102	75-125	0.4066	0.4006	100	1.5	20	-	-	< 0.0005
				0.400	16W3874q	< 0.0005	0.4256	106	75-125	0.4256	0.4282	107	0.6	20	-	-	< 0.0005
				0.400	16W3898q	0.0010	0.4022	100	75-125	0.4022	0.4134	103	2.7	20	-	-	< 0.0005
Lithium - Dissolved mg/l	0.40	100	80-120	0.800	16-W3827	1.24	1.87	79	75-125	1.87	1.91	84	2.1	20	-	-	< 0.1
				0.800	16-W3869	1.39	2.13	93	75-125	2.13	2.05	82	3.8	20	-	-	< 0.1



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Quality Control Report

Lab IDs: 16-W3866 to 16-W3869

Project: MDU Heskett CCR GR August 2016

Work Order: 201682-2748

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	92	80-120	0.400	16-W3786	0.81	1.19	95	75-125	1.19	1.18	92	0.8	20	-	-	< 0.1
				0.400	16-W3829	0.44	0.92	120	0.92	0.93	122	1.1	20	-	-	< 0.1	
																	-
Magnesium - Dissolved mg/l	20.0 20.0	111 108	80-120 80-120	500	16-W3827	720	1260	108	75-125	1260	1240	104	1.6	20	-	-	< 1
				500	16-W3869	880	1460	116	75-125	1460	1420	108	2.8	20	-	-	< 1
																	-
Magnesium - Total mg/l	20.0 20.0	106 117	80-120 80-120	500	16W3829q	148	625	95	75-125	625	630	96	0.8	20	-	-	< 1
				100	16W3859q	7.4	113	106	75-125	113	113	106	0.0	20	-	-	< 1
				100	16W3885q	28.4	128	100	75-125	128	129	101	0.8	20	-	-	< 1
Mercury - Dissolved mg/l	0.0020	90	85-115	0.002	16-W3868	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	< 0.0002
				0.002	16-W3869	< 0.0002	0.0017	85	70-130	0.0017	0.0017	85	0.0	20	-	-	< 0.0002
Mercury - Total mg/l	0.0020	95	85-115	0.002	A43991	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20	-	-	< 0.0002
				0.002	16-W3866	< 0.0002	0.0019	95	70-130	0.0019	0.0019	95	0.0	20	-	-	< 0.0002
				0.002	16-W3896	< 0.0002	0.0019	95	70-130	0.0019	0.0018	90	5.4	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.1000	105	80-120	0.100	16-W3869	< 0.002	0.1140	114	75-125	0.1140	0.1208	121	5.8	20	-	-	< 0.002
Molybdenum - Total mg/l	0.1000	102	80-120	0.400	16W3855q	0.0074	0.4220	104	75-125	0.4220	0.4098	101	2.9	20	-	-	< 0.002
				0.400	16W3874q	0.0069	0.4358	107	75-125	0.4358	0.4268	105	2.1	20	-	-	< 0.002
				0.400	16W3898q	0.0024	0.4456	111	75-125	0.4456	0.4594	114	3.0	20	-	-	< 0.002
pH units	-	-	-	-	-	-	-	-	-	12.2	12.2	-	0.0	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.5	7.5	-	0.0	20	-	-	-
Potassium - Dissolved mg/l	10.0	106	80-120	100	16-W3827	23.4	136	113	75-125	136	134	111	1.5	20	-	-	< 1
	10.0	103	80-120	100	16-W3869	20.5	140	120	75-125	140	137	116	2.2	20	-	-	< 1
															-	-	< 1
															-	-	< 1



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Lab IDs: 16-W3866 to 16-W3869

Project: MDU Heskett CCR GR August 2016

Work Order: 201682-2748

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	91	80-120	100	16W3829q	10.3	105	95	75-125	105	108	98	2.8	20	-	-	< 1
	10.0	100	80-120	20.0	16W3859q	2.8	24.1	106	75-125	24.1	24.1	106	0.0	20	-	-	< 1
				20.0	16W3885q	4.4	24.0	98	75-125	24.0	24.3	99	1.2	20	-	-	< 1
Selenium - Dissolved mg/l	0.1000	118	80-120	0.100	16-W3869	< 0.005	0.1246	125	75-125	0.1246	0.1332	129	6.7	20	-	-	< 0.002
Selenium - Total mg/l	0.1000	115	80-120	0.400	16W3855q	< 0.002	0.5170	129	75-125	0.5170	0.4934	123	4.7	20	-	-	< 0.002
				0.400	16W3874q	< 0.002	0.5496	137	75-125	0.5120	128	7.1	20	-	-	< 0.002	
				0.400	16W3898q	0.0024	0.5150	128	75-125	0.5150	0.5286	132	2.6	20	-	-	< 0.002
Sodium - Dissolved mg/l	20.0	112	80-120	500	16-W3827	805	1340	107	75-125	1340	1300	99	3.0	20	-	-	< 1
	20.0	110	80-120	500	16-W3869	885	1450	113	75-125	1450	1420	107	2.1	20	-	-	< 1
Sodium - Total mg/l	20.0	98	80-120	500	16W3829q	493	950	91	75-125	950	940	89	1.1	20	-	-	< 1
	20.0	108	80-120	100	16W3859q	222	311	89	75-125	311	313	91	0.6	20	-	-	< 1
				100	16W3885q	65.3	162	97	75-125	162	160	95	1.2	20	-	-	< 1
Sulfate mg/l	100	97	90-110	100	16-W3828	< 5	95.4	95	80-120	95.4	105	105	9.6	20	-	-	< 5
	100	96	90-110	10000	16-W3867	10500	18800	83	80-120	18800	18900	84	0.5	20	-	-	< 5
Thallium - Dissolved mg/l	0.1000	94	80-120	0.100	16-W3869	< 0.0005	0.0876	88	75-125	0.0876	0.0881	88	0.6	20	-	-	< 0.0005
Thallium - Total mg/l	0.1000	98	80-120	0.400	16W3855q	< 0.0005	0.3870	97	75-125	0.3870	0.3766	94	2.7	20	-	-	< 0.0005
				0.400	16W3874q	< 0.0005	0.3982	100	75-125	0.3982	0.4124	103	3.5	20	-	-	< 0.0005
				0.400	16W3898q	< 0.0005	0.3838	96	75-125	0.3838	0.3880	97	1.1	20	-	-	< 0.0005
Total Alkalinity mg/l CaCO3	410	99	90-110	410	16-W3830	459	850	95	80-120	850	847	95	0.4	20	94	80-120	< 20
				410	16-W3831	484	871	94	80-120	871	872	95	0.1	20	-	-	< 20
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	642	645	-	0.5	20	-	-	< 5
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	338	328	-	3.0	20	-	-	< 1
	-	-	-	-	-	-	-	-	-	15	15	-	0.0	20	-	-	< 1

Approved by: C. Cantor
16 Sep 16



Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Heskett

Well ID	Date	Time	Depth to Water	Comments
MW1-90	31 Aug 16	1352	11.86	
MW-2	31 Aug 16	1355	38.68	
MW-8	31 Aug 16	1359	17.03	
MW-4B	31 Aug 16	1401	17.70	

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Darren Nieswaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 31 Aug 16 Time: 0727

	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>22.67</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-40.3</u>	0 +/- 50
Buffer 10	<u>22.50</u>	<u>9.93</u>	<u>10.00</u>	9.95-10.05	<u>-215.4</u>	-180 +/- 50
Conductivity						Check
Buffer 10000	<u>22.53</u>	<u>10147</u>	<u>9999</u>	±10%	Buffer 5000	<u>4960</u>
ORP						
231 mV @ 25C	<u>22.24</u>	<u>8.53</u>	<u>8.24</u>	±10 mV		
DO	<u>5.32</u>	<u>256.3</u>	<u>257.2</u>			
	<u>22.24</u>	<u>8.53</u>	<u>8.24</u>	Barometric Pressure (mm Hg)		
				mg/L	<u>721.0</u>	

Post Site Check

Time: 1439

	Temp °C	Reading
Buffer 7	<u>23.11</u>	<u>7.02</u>
Conductivity		
Buffer 5000	<u>23.44</u>	<u>4951</u>

Date: _____ Time: _____

	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 10000				±10%	Buffer 5000	
ORP						
231 mV @ 25C	<u>22.24</u>	<u>8.53</u>	<u>8.24</u>	±10 mV		
DO						
				Barometric Pressure (mm Hg)		
				mg/L		

Time: _____

	Temp °C	Reading
Buffer 7		
Conductivity		
Buffer 5000		



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: August 2016
Sample ID: MW105
Sampling Personal: Darren Newsome

Weather Conditions: Temp: 77 °F Wind: SE 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:	13.60	ft	
Total Well Depth:	-	ft	
Well Volume:	-	liters	
Depth to Top of Pump:	21.24	ft	
Water Level After Sample:	13.90	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	54 sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Recover:	56 sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	-
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	31 Aug 16	Time Purging Began:	11:29 am	pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	31 Aug 16	Time of Sampling:	1244	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.
1134	1		12.91	6427	6.67	2.85	123.9	39.6	13.79	500	Clear
1144	2		14.27	6419	6.68	0.71	119.5	17.3	13.79	81000	Clear
	3		12.86	6896	6.66	0.76	118.3	8.49	13.90	1000	Clear
	4		12.77	7102	6.64	0.61	116.9	8.40	13.90	1000	Clear
	5		12.45	7296	6.65	0.70	115.7	7.73	13.90	1000	Clear
	6		12.63	7407	6.65	0.53	114.6	6.70	13.90	1000	Clear
	7		12.94	7555	6.64	0.58	113.4	4.88	13.90	1000	Clear
	8		13.05	7555	6.62	0.52	113.6	4.78	13.90	500	Clear
	9		13.06	7590	6.64	0.55	113.1	4.71	13.90	500	Clear
	10										

Stabilized: Yes No
Comments:

Total Volume Removed: ~~8500~~ mL **7,500 mL (TAO 10/18/16)**



Laboratories, Inc.

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

Chain of Custody Record

Project Name: MDU Heskett CCR Groundwater August 2016				Name of Sampler(s): <i>Darren Nieswaag</i>				
Report To: MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829			Carbon Copy: Attn: Address:			Work Order Number: <i>82-2748</i>		

Sample Information						Bottle Type			Field Parameters			Analysis		
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	500 ml HNO ₃	1 liter	500 ml HNO ₃ (filtered)			Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
<i>*</i>	<i>Dup 1</i>	<i>—</i>	NA	W		X	X	X			NA	NA	NA	MDU CCR List with TSS and Dissolved CCR Metals. No RadChem.
<i>W3866</i>	Field Blank (FB)	<i>31 Aug 16</i>	NA	W		X	X	X			NA	NA	NA	
<i>W3867</i>	<i>MW 104</i>	<i>31 Aug 16</i>	<i>0900</i>	GW		X	X	X			<i>12.44</i>	<i>14048</i>	<i>6.88</i>	
<i>W3868</i>	<i>MW 80R</i>	<i>31 Aug 16</i>	<i>1024</i>	GW		X	X	X			<i>12.62</i>	<i>5734</i>	<i>7.01</i>	
<i>W3869</i>	<i>MW 105</i>	<i>31 Aug 16</i>	<i>1244</i>	GW		X	X	X			<i>13.06</i>	<i>7590</i>	<i>6.64</i>	

Comments: ** DN 31 Aug 16*

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	<i>Darren Nieswaag</i>	<i>* + Login</i>	<i>31 Aug 16 1447</i>	<i>C. Jackson</i>		<i>31 Aug 16 1447</i>	<i>3.8°C TMS88</i>
2							<i>ROI</i>
3							



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October 21, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the August sampling event had an error. The error was the amount of volume removed for well 105. The initial report had 8500mL listed for volume removed but after reviewing the field sheet the actual volume removed was 7500mL. The attached field data report has the corrected data.

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

Sincerely,

Jeremy Meyer
MVTL Field Services



MVTL Laboratories Inc.
FIELD DATA REPORT

WO# 82-2728 82-2749 82-2696
82-2724 82-2748 82-2694

MDU Heskett
GROUNDWATER SAMPLING - NDDH
Attn: Samantha Marshall
400 N. 4th St
Bismarck, ND 58501
701-222-7829

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	pH	Turbidity NTU	SAMPLE APPEARANCE
2-90	30-Aug-16	16:17	30-Aug-16	16:37	1686.60	1665.02	21.58	24.80	NA	2.0	2000.0	Bladder	11.62	7676	6.86	0.53	clear
3-90	30-Aug-16	14:55	30-Aug-16	15:15	1686.01	1666.98	19.03	21.93	19.12	1.8	2000.0	Bladder	13.89	5222	6.80	1.61	clear
13	29-Aug-16	8:31	29-Aug-16	9:01	1724.98	1694.76	30.22	41.90	30.72	7.2	3000.0	Bladder	12.41	10873	6.81	1.15	clear
33	30-Aug-16	12:53	30-Aug-16	13:52	1717.91	1675.83	42.08	46.55	42.73	2.8	6000.0	Bladder	13.67	5298	6.45	1.69	clear
70	30-Aug-16	8:30	30-Aug-16	8:50	1706.36	1685.02	21.34	43.06	22.67	13.4	2000.0	Bladder	9.54	4136	6.90	4.76	clear
80R	31-Aug-16	10:04	31-Aug-16	10:24	NA	NA	14.80	30.10	15.09	9.4	2000.0	Bladder	12.62	5734	7.01	1.42	clear
44R	29-Aug-16	11:51	29-Aug-16	12:16	NA	NA	28.74	45.88	28.83	10.6	2500.0	Bladder	11.77	9498	6.50	0.73	clear
101	30-Aug-16	9:53	30-Aug-16	11:43	NA	NA	37.18	57.09	41.59	12.3	11000.0	Bladder	14.11	4968	6.67	4.88	clear
102	29-Aug-16	13:17	29-Aug-16	14:07	NA	NA	17.78	33.20	21.88	9.5	5000.0	Bladder	13.76	8160	6.76	2.87	clear
103	29-Aug-16	10:09	29-Aug-16	10:44	NA	NA	33.16	47.10	37.14	8.6	3500.0	Bladder	11.07	5247	6.64	1.63	clear
104	31-Aug-16	8:30	31-Aug-16	9:00	NA	NA	14.41	32.85	14.71	11.4	3000.0	Bladder	12.44	14048	6.88	4.30	clear
105	31-Aug-16	11:29	31-Aug-16	12:44	NA	NA	13.60	32.39	13.90	11.6	7500.0	Bladder	13.06	7590	6.64	4.71	clear
1-90	NA	NA	31-Aug-16	13:52	1675.86	1664.00	11.86	17.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
2	NA	NA	31-Aug-16	13:55	1698.60	1659.92	38.68	63.70	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
4B	NA	NA	31-Aug-16	14:01	1662.80	1645.10	17.70	26.15	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only
8	NA	NA	31-Aug-16	13:59	1664.90	1647.87	17.03	28.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201682-2749
IML Lab Reference No/SDG: S1609050
Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site
Project Identification: CCR August 2016
MVTL Laboratory Identifications: 16-W3870 through 16-W3873
IML Laboratory Identifications: S1609050-001 through S1609050-004
Page 1 of 2

Table with 3 columns: MDU Sample Identification, MVTL Laboratory #, IML Laboratory #. Rows include Field Blank (FB), MW104, MW80R, and MW105.

I. RECEIPT

- All samples were received at the laboratory on 31 August 2016 at 1447.
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 3.8°C.
No other exceptions on sample receipt were encountered on this sample set unless noted here.
All samples requiring radiochemistry analysis were sent via courier to Inter-Mountain Labs (IML) for analysis there.
Samples were received at IML on 6 September 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.

III. METHODS

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



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201682-2749
IML Lab Reference No/SDG: S1609050
Client: Montana Dakota Utilities
Location: MDU Heskett Ash Site
Project Identification: CCR August 2016
MVTL Laboratory Identifications: 16-W3870 through 16-W3873
IML Laboratory Identifications: S1609050-001 through S1609050-004
Page 2 of 2

IV. ANALYSIS

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

V. REPORTING

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 7 OCT 16
Claudette Carroll - MVTL Bismarck Laboratory Manager



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Page: 1 of 1

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

Report Date: 6 Oct 16
Lab Number: 16-W3872
Work Order #: 82-2749
Account #: 002800
Date Sampled: 31 Aug 16 10:24
Date Received: 1 Sep 16 14:47
Sampled By: MVTL Field Services

Project Name: MDU Heskett CCR Radiochem Aug. 2016
Sample Description: MW80R

Temp at Receipt: 3.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	7.01 units	NA	SM 4500 H+ B	31 Aug 16 10:24	DJN
Temperature - Field	12.6 Degrees C	NA	SM 2550B	31 Aug 16 10:24	DJN
Conductivity - Field	5734 umhos/cm	1	EPA 120.1	31 Aug 16 10:24	DJN
Radium 226	See Attached Report			14 Sep 16	OL
Radium 228	See Attached Report			21 Sep 16	OL

OL = Analysis performed by an Outside Laboratory.

Approved by: Claudette K. Carroll ^{cc} 7 OCT 16

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: 9/29/2016

CLIENT: MVTL Laboratories, Inc.
Project: 201682-9720
Lab Order: S1609050

CASE NARRATIVE
Report ID: S1609050001

Samples 16-W3870 Field BLANK, 16-W3871 MW104, 16-W3872 MW80R, and 16-W3873 MW105 were received on September 6, 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 9/29/2016
Report ID S1609050001

ProjectName: 201682-9720
Lab ID: S1609050-001
ClientSample ID: 16-W3870 Field BLANK
COC: 201682-2749

WorkOrder: S1609050
CollectionDate: 8/31/2016
DateReceived: 9/6/2016 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

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

Radionuclides - Total

Radium 226	0.2	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436 MB
Radium 228	-1.0	pCi/L		1	Ga-Tech	09/21/2016 209 MB
Radium 228 Precision (±)	3.5	pCi/L			Ga-Tech	09/21/2016 209 MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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 9/29/2016
Report ID S1609050001

ProjectName: 201682-9720
Lab ID: S1609050-002
ClientSample ID: 16-W3871 MW104
COC: 201682-2749

WorkOrder: S1609050
CollectionDate: 8/31/2016 9:00:00 AM
DateReceived: 9/6/2016 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.5	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	MB
Radium 228	0.4	pCi/L		1	Ga-Tech	09/21/2016 510	MB
Radium 228 Precision (±)	3.1	pCi/L			Ga-Tech	09/21/2016 510	MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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 9/29/2016
Report ID S1609050001

ProjectName: 201682-9720
Lab ID: S1609050-003
ClientSample ID: 16-W3872 MW80R
COC: 201682-2749

WorkOrder: S1609050
CollectionDate: 8/31/2016 10:24:00 AM
DateReceived: 9/6/2016 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init	
Radionuclides - Total							
Radium 226	0.19	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436	MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436	MB
Radium 228	-2.3	pCi/L		1	Ga-Tech	09/21/2016 811	MB
Radium 228 Precision (±)	3.4	pCi/L			Ga-Tech	09/21/2016 811	MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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



Sample Analysis Report

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

Date Reported 9/29/2016
Report ID S1609050001

ProjectName: 201682-9720
Lab ID: S1609050-004
ClientSample ID: 16-W3873 MW105
COC: 201682-2749

WorkOrder: S1609050
CollectionDate: 8/31/2016 12:44:00 PM
DateReceived: 9/6/2016 11:43:00 AM
FieldSampler:
Matrix: Water

Comments

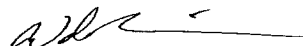
Analyses	Result	Units	Qual	RL	Method	Date Analyzed/Init
Radionuclides - Total						
Radium 226	0.3	pCi/L		0.2	SM 7500 Ra-B	09/14/2016 1436 MB
Radium 226 Precision (±)	0.1	pCi/L			SM 7500 Ra-B	09/14/2016 1436 MB
Radium 228	-5.1	pCi/L		1	Ga-Tech	09/21/2016 1112 MB
Radium 228 Precision (±)	3.3	pCi/L			Ga-Tech	09/21/2016 1112 MB

These results apply only to the samples tested.

RL - Reporting Limit

- | | | |
|--------------------|--|--|
| Qualifiers: | 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: S1609050
Project: 201682-9720

Date: 9/29/2016
Report ID: S1609050001

Radium 228 by Ga/Tech		Sample Type	MBLK		Units: pCi/L				
MB-385 (09/20/16 11:04)	Analyte	RunNo: 138998	PrepDate: 09/12/16 12:00	BatchID: 12321					
		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-385 (09/20/16 14:05)	Analyte	RunNo: 138998	PrepDate: 09/12/16 12:00	BatchID: 12321					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		42	1	38.5		109	61.3 - 120		

Radium 228 by Ga/Tech		Sample Type	MS		Units: pCi/L				
MS-385 (09/20/16 20:07)	Analyte	RunNo: 138998	PrepDate: 09/12/16 12:00	BatchID: 12321					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Total Radium 228		41	1	38.5	ND	107	64.3 - 120		

Radium 228 by Ga/Tech		Sample Type	MSD		Units: pCi/L				
MSD-385 (09/20/16 23:08)	Analyte	RunNo: 138998	PrepDate: 09/12/16 12:00	BatchID: 12321					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Total Radium 228		45	1	41	8.97	117	20		

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MBLK		Units: pCi/L				
MB-1661 (09/14/16 14:36)	Analyte	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		ND	0.2						

Radium 226 in Water - Total by SM7500RA_B		Sample Type	LCS		Units: pCi/L				
LCS-1661 (09/14/16 14:36)	Analyte	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		4.8	0.2	5.99		79.9	67.1 - 122		

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MS		Units: pCi/L				
MS-1661 (09/14/16 14:36)	Analyte	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299					
		Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual	
Radium 226		5.6	0.2	5.99	ND	94.0	65 - 131		

Radium 226 in Water - Total by SM7500RA_B		Sample Type	MSD		Units: pCi/L				
MSD-1661 (09/14/16 14:36)	Analyte	RunNo: 138741	PrepDate: 09/07/16 0:00	BatchID: 12299					
		Result	RL	Conc	%RPD	%REC	% RPD Limits	Qual	
Radium 226		5.0	0.2	5.6	12.2	83.3	20		

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

201682-2749

Company Name and Address: <p style="text-align: center;"><u>MVTL</u> 2616 E Broadway Bismarck, ND 58501</p>	Account #: 	Phone #: <p style="text-align: center;">701-258-9720</p>
Billing Address (indicate if different from above): <p style="text-align: center;"><u>PO Box 249</u> <u>New Ulm, MN 56073</u></p>	Contact: <p style="text-align: center;">Claudette</p>	Fax #: For faxed report check box <input type="checkbox"/>
	Name of Sampler: 	E-mail: <u>ccarroll@mvtl.com</u> For e-mail report check box <input type="checkbox"/>
	Quote Number 	Date Submitted: <p style="text-align: center;">9/1/2016</p>
	Project Name/Number: 	Purchase Order #: <p style="text-align: center;">BL5656</p>

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
<i>213</i> <i>51605</i> <i>51609050</i> 001	16-W3870	Field Blank		8/31/2016							Ra226 & Ra228 on all
002	16-W3871	MW104		8/31/2016	900						
003	16-W3872	MW80R		8/31/2016	1024						
004	16-W3873	MW105		8/31/2016	1244						

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

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
C. Jackson		1700		<i>Kathy Boyd</i>	9.6.16	11:43 16.7°C
2.						



Laboratories, Inc.

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

Chain of Custody Record

Project Name: MDU Heskett CCR Radiochem August 2016				Name of Sampler(s): <i>Darren Nieswang</i>				
Report To: MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 Phone: 701-222-7829			Carbon Copy: Attn: Address:			Work Order Number: <i>82-2749</i>		

Sample Information					Bottle Type				Field Parameters			Analysis	
Lab Number	Sample ID	Date	Time	Sample Type	Gradient	1000 ml HNO ₃				Field Temperature °C	Field Spec. Cond.	Field pH	Analysis Required
<i>*</i>	Dup 1	—	NA	W		4				NA	NA	NA	MDU CCR Numerical RadChem
<i>W3870</i>	Field Blank (FB)	<i>31 Aug 16</i>	NA	W		4				NA	NA	NA	
<i>W3871</i>	<i>MW 104</i>	<i>31 Aug 16</i>	<i>0900</i>	GW		4				<i>12.44</i>	<i>14048</i>	<i>6.88</i>	
<i>W3872</i>	<i>MW 80R</i>	<i>31 Aug 16</i>	<i>1024</i>	GW		4				<i>12.62</i>	<i>5734</i>	<i>7.01</i>	
<i>W3873</i>	<i>* MW 105</i>	<i>31 Aug 16</i>	<i>1244</i>	GW		4				<i>13.06</i>	<i>7590</i>	<i>6.64</i>	

Comments: ** DN 31 Aug 16*

	Transferred by:	Sample Condition	Date/Time	Received by:	Sample Condition	Date/Time	° C
1	<i>Darren Nieswang</i>	<i>Log in</i>	<i>31 Aug 16 1447</i>	<i>C. Jackson</i>		<i>31 Aug 16 1447</i>	<i>3.8°C IM588</i>
2							<i>ROI</i>
3							

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Darren Nieswaag

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration

Date: 31 Aug 16 Time: 0727

pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	<u>22.67</u>	<u>7.00</u>	<u>7.00</u>	6.95-7.05	<u>-40.3</u>	0 +/- 50
Buffer 10	<u>22.50</u>	<u>9.93</u>	<u>10.00</u>	9.95-10.05	<u>-215.4</u>	-180 +/- 50

Conductivity

Buffer 10000	<u>22.53</u>	<u>10147</u>	<u>9999</u>	±10%	Buffer 5000	<u>4960</u>
--------------	--------------	--------------	-------------	------	-------------	-------------

ORP

231 mV @ 25C ~~22.24~~ ~~8.53~~ ~~8.24~~ ±10 mV

DO

	<u>5.32</u>	<u>256.3</u>	<u>257.2</u>
--	-------------	--------------	--------------

Barometric Pressure (mm Hg) 721.0
mg/L

Post Site Check

Time: 1439

pH	Temp °C	Reading
Buffer 7	<u>23.11</u>	<u>7.02</u>

Conductivity

Buffer 5000	<u>23.44</u>	<u>4951</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

Buffer 10000				±10%	Buffer 5000	
--------------	--	--	--	------	-------------	--

ORP

231 mV @ 25C ~~22.24~~ ~~8.53~~ ~~8.24~~ ±10 mV

DO

--	--	--	--

Barometric Pressure (mm Hg) _____
mg/L _____

Time: _____

pH	Temp °C	Reading
Buffer 7		

Conductivity

Buffer 5000		
-------------	--	--



Field Datasheet

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Water Level

Sampling Personnel:

Darren Nieswaag

Company:

MDU Heskett

Well ID	Date	Time	Depth to Water	Comments
MW1-90	31 Aug 16	1352	11.86	
MW-2	31 Aug 16	1355	38.68	
MW-8	31 Aug 16	1359	17.03	
MW-4B	31 Aug 16	1401	17.70	



Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett
Event: August 2016
Sample ID: MW105
Sampling Personal: Darren Nieswager

Weather Conditions: Temp: 77 °F Wind: SE 10 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:	13.60	ft	
Total Well Depth:	ft		
Well Volume:	liters		
Depth to Top of Pump:	21.24	ft	
Water Level After Sample:	13.90	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	54 sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes	No	Recover:	56 sec.
Duplicate Sample?:	Yes	<input checked="" type="checkbox"/> No	PSI:	—
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	31 Aug 16	Time Purging Began:	11:29 am	pm
Well Purged Dry?	Yes	<input checked="" type="checkbox"/> No	Time Purged Dry:	— am/pm
Sample Date:	31 Aug 16	Time of Sampling:	12:44	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	11:44 10:37	14.27	6419	6.68	0.71	119.5	17.3	13.79	85000	Clear
3	11:54	12.86	6896	6.66	0.76	118.3	8.49	13.90	1000	Clear
4	12:04	12.77	7102	6.66	0.61	116.9	8.40	13.90	1000	Clear
5	12:14	12.45	7296	6.65	0.70	115.7	7.73	13.90	1080	Clear
6	12:24	12.63	7407	6.65	0.53	114.6	6.70	13.90	1000	Clear
7	12:34	12.94	7555	6.64	0.58	113.4	4.88	13.90	1000	Clear
8	12:39	13.05	7555	6.62	0.52	113.6	4.78	13.90	1500	Clear
9	12:42	13.06	7590	6.64	0.55	113.1	4.71	13.90	500	Clear
10										

Stabilized: Yes No
Comments:

Total Volume Removed: ~~8500~~ mL **7,500 mL (TAO 10/18/16)**



CASE NARRATIVE – AMENDED 21 NOV 17 (Reporting)

MVTl Lab Reference No/SDG: 201782-2789
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR October 2017
MVTl Laboratory Identifications: 17-W4292 through 17-W4299
Page 1 of 2

Table with 2 columns: MDU Sample Identification, MVTL Laboratory #. Rows include 103, 44R, 13, Dup-1, 102, 70, 101, FB1.

I. RECEIPT

- All samples were received at the laboratory on 5 Oct 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 4.2°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 was used to analyze the metals.

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.



CASE NARRATIVE – AMENDED 21 NOV 17 (Reporting)

MVTL Lab Reference No/SDG: 201782-2789
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR October 2017
MVTL Laboratory Identifications: 17-W4292 through 17-W4299
Page 2 of 2

- Recovery for one sulfate 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.

V. REPORTING

- 10 Nov 17: Per email dated 9 Nov 17 from Terri Olson with Barr Engineering, the case narrative was amended to remove the inclusion of Method 6020B under the Methods (III) section. In addition, the field summary sheets were amended to correct for errors.

All laboratory data has been approved by MVTL Laboratories.

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

Claudette Carroll

From: Terri A. Olson <TOlson@barr.com>
Sent: Thursday, November 09, 2017 9:10 PM
To: Claudette Carroll
Subject: RE: 201782-2789 MDU HESK CCR OCT 17.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Claudette,

I reviewed this report and noted the following:

- The MW101 data on the Field Data Report (FDR) does not match the raw data for the following:
 - Total Volume Removed: FDR = 3000, raw data = 7000
 - Temperature: FDR = 14.53, raw data = 10.89
 - Conductivity: FDR = 4854, raw data = 4829
 - Turbidity: FDR = 10.10, raw data = 2.82
- The MW70 data on the FDR has pH = 6.69, raw data = 6.96
- In previous CCR reports, a note was included in the report's case narrative under Section III. Methods stating Methods 6010D and 6020B were used for the metals analyses. Since only Appendix III parameters were analyzed and reported, Method 6020B was not used, only method 6010D.

Thank-you,

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

resourceful. naturally.



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From: Claudette Carroll [mailto:ccarroll@mvtl.com]
Sent: Wednesday, November 01, 2017 5:05 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>; Tonia D. O'Brien <tobrien@barr.com>
Subject: 201782-2789 MDU HESK CCR OCT 17.pdf

Hello all,

Please find attached one data package for the CCR sampling done in Oct 2017 at MDU Heskett. Hard copies and EDDs will follow. I will send the State package shortly.

Have a great night,

Claudette



**Minnesota Valley Testing
Laboratories, Inc.**

Providing Analytical Excellence Since 1951

ccarroll@mvtl.com

701-258-9720

2616 E. Broadway Ave/Bismarck, ND 58501

Quality Control Report

Lab IDs: 17-W4292 to 17-W4299

Project: MDU Heskett - CCR

Work Order: 201782-2789

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	110	80-120	8.00	17-W4262	2.48	10.8	104	75-125	10.8	10.7	103	0.9	20	-	-	< 0.1
	0.40	108	80-120	0.400	17-W4264	< 0.1	0.44	110	75-125	0.44	0.43	108	2.3	20	-	-	< 0.1
				0.400	17-W4297	0.52	0.91	98	75-125	0.91	0.92	100	1.1	20	-	-	< 0.1
Calcium - Total mg/l	20.0	104	80-120	100	17W4263q	41.8	137	95	75-125	137	134	92	2.2	20	-	-	< 1
	20.0	106	80-120	100	17W4304q	5.8	104	98	75-125	104	106	100	1.9	20	-	-	< 1
				500	17W4312q	500	995	99	75-125	995	1020	104	2.5	20	-	-	< 1
Chloride mg/l	30.0	89	80-120	30.0	17-W4261	24.6	53.6	97	80-120	53.6	52.8	94	1.5	20	-	-	< 1
	30.0	91	80-120												-	-	< 1
Fluoride mg/l	0.50	90	90-110	0.500	17-W4293	0.60	1.00	80	80-120	1.00	1.01	82	1.0	20	-	-	< 0.1
	0.50	96	90-110	0.500	17-W4304	0.44	0.91	94	80-120	0.91	0.92	96	1.1	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	-	-	7.4	7.5	-	1.3	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.1	7.2	-	1.4	20	-	-	-
Sulfate mg/l	100	102	80-120	4000	17-W4299	< 200	3730	93	80-120	3730	3610	90	3.3	20	-	-	< 5
	100	93	80-120	500	17-D3526	339	731	78	80-120	731	739	80	1.1	20	-	-	< 5
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	1100	1070	-	2.8	20	-	-	< 10
	-	-	-	-	-	-	-	-	-	< 10	< 10	-	0.0	*	-	-	< 10
	-	-	-	-	-	-	-	-	-	4820	4830	-	0.2	20	-	-	< 10

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

Approved by: _____

*C. Campbell**1 NOV 17*



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Page: 1 of 8

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Oct 17
 Lab Number: 17-W4292
 Work Order #: 82-2789
 Account #: 002800
 Date Sampled: 4 Oct 17 9:19
 Date Received: 5 Oct 17 8:00
 Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 103

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.68	units	NA	SM 4500 H+ B	4 Oct 17 9:19	DJN
pH	* 7.1	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	8.49	Degrees C	NA	SM 2550B	4 Oct 17 9:19	DJN
Conductivity - Field	5055	umhos/cm	1	EPA 120.1	4 Oct 17 9:19	DJN
Fluoride	0.12	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	2770	mg/l	5.00	ASTM D516-07	26 Oct 17 8:11	EMS
Chloride	147	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	4630	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	600	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	< 0.5 @	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} *1/11/17*

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: 2 of 8

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 27 Oct 17
 Lab Number: 17-W4293
 Work Order #: 82-2789
 Account #: 002800
 Date Sampled: 4 Oct 17 10:26
 Date Received: 5 Oct 17 8:00
 Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 44R

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.54	units	NA	SM 4500 H+ B	4 Oct 17 10:26	DJN
pH	* 7.0	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	8.62	Degrees C	NA	SM 2550B	4 Oct 17 10:26	DJN
Conductivity - Field	9132	umhos/cm	1	EPA 120.1	4 Oct 17 10:26	DJN
Fluoride	0.60	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	5650	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	226	mg/l	1.0	SM4500-CL-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	9400	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	414	mg/l	1.0	6010D	16 Oct 17 11:30	SZ
Boron - Total	0.56	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} 1 NOV 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: 27 Oct 17
Lab Number: 17-W4294
Work Order #: 82-2789
Account #: 002800
Date Sampled: 4 Oct 17 11:32
Date Received: 5 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 13

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

Table with 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

CC 1/8/17

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: 27 Oct 17
Lab Number: 17-W4295
Work Order #: 82-2789
Account #: 002800
Date Sampled: 4 Oct 17
Date Received: 5 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: Dup-1

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH	* 7.4	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Fluoride	0.86	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	6100	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	80.9	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	9450	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	404	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.72	mg/l	0.10	6010D	12 Oct 17 14:40	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} 10/10/17

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: 27 Oct 17
Lab Number: 17-W4296
Work Order #: 82-2789
Account #: 002800
Date Sampled: 4 Oct 17 13:24
Date Received: 5 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 102

Temp at Receipt: 4.2C ROI

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 signature) CC INV17

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: 27 Oct 17
Lab Number: 17-W4297
Work Order #: 82-2789
Account #: 002800
Date Sampled: 4 Oct 17 14:19
Date Received: 5 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 70

Temp at Receipt: 4.2C ROI

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 signature) CC 1/10/17

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: 27 Oct 17
Lab Number: 17-W4298
Work Order #: 82-2789
Account #: 002800
Date Sampled: 4 Oct 17 15:59
Date Received: 5 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 101

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	5 Oct 17	SVS
pH - Field	6.68	units	NA	SM 4500 H+ B	4 Oct 17 15:59	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	6 Oct 17 18:00	SVS
Temperature - Field	10.9	Degrees C	NA	SM 2550B	4 Oct 17 15:59	DJN
Conductivity - Field	4829	umhos/cm	1	EPA 120.1	4 Oct 17 15:59	DJN
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	6 Oct 17 18:00	SVS
Sulfate	2560	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	17.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	4340	mg/l	10	I1750-85	6 Oct 17 14:32	SVS
Calcium - Total	392	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	1.24	mg/l	0.10	6010D	12 Oct 17 15:20	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} *1 NOV 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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November 17, 2017

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

It was brought to MVTL's attention by BARR that the field data report for the October 2017 had some transcription errors. Please see the attached field data report with the corrections.

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

Sincerely,

Jeremy Meyer
MVTL Field Services



MVT L Laboratories Inc.
FIELD DATA REPORT

WO# 82-2789
82-2797
82-2798

MDU Heskett
GROUNDWATER SAMPLING

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

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	WATER LEVEL END	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	pH	Turbidity NTU	SAMPLE APPEARANCE OR COMMENT
2-90	5-Oct-17	11:23	5-Oct-17	11:53	1686.60	1664.79	21.81	22.18	3000.0	Bladder	9.16	7456	6.97	0.51	clear
3-90	5-Oct-17	10:09	5-Oct-17	10:34	1686.01	1666.21	19.80	19.88	2500.0	Bladder	9.49	4859	6.88	0.64	clear
13	4-Oct-17	10:57	4-Oct-17	11:32	1724.98	1694.36	30.62	31.12	3500.0	Bladder	8.84	10339	6.86	1.28	clear
33	5-Oct-17	8:30	5-Oct-17	9:40	1717.91	1676.43	41.48	41.72	7000.0	Bladder	9.71	4952	6.58	2.53	clear
70	4-Oct-17	13:54	4-Oct-17	14:19	1706.36	1684.87	21.49	22.06	2500.0	Bladder	11.94	4618	6.96*	0.39	clear
80R	5-Oct-17	14:24	5-Oct-17	14:59	NA	NA	14.33	14.58	3500.0	Bladder	12.03	5656	7.10	0.38	clear
44R	4-Oct-17	9:46	4-Oct-17	10:26	NA	NA	27.58	27.66	4000.0	Bladder	8.62	9132	6.54	1.62	clear
101	4-Oct-17	14:49	4-Oct-17	15:59	NA	NA	36.54	NR	7000.0*	Bladder	10.89*	4829*	6.68	2.82*	clear
102	4-Oct-17	12:24	4-Oct-17	13:24	NA	NA	17.94	20.52	6000.0	Bladder	10.03	7741	6.82	0.94	clear
103	4-Oct-17	8:39	4-Oct-17	9:19	NA	NA	31.80	34.11	4000.0	Bladder	8.49	5055	6.68	0.27	clear
104	5-Oct-17	13:15	5-Oct-17	13:55	NA	NA	13.82	14.08	4000.00	Bladder	12.01	14044	6.94	0.41	clear
105	5-Oct-17	15:25	5-Oct-17	16:00	NA	NA	13.14	13.24	3500.0	Bladder	11.89	6514	6.76	2.92	clear
1-90	5-Oct-17	12:22	5-Oct-17	12:47	1675.86	1664.10	11.76	11.83	2500.0	Bladder	11.37	9736	6.85	0.33	clear

NR = Not Recorded on Field Sheet NA = Not Applicable

*Amended on 17 Nov 17



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2017
Sample ID: 44R
Sampling Personal: *Parren Niesing*

Weather Conditions: Temp: 42 °F Wind: W10 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:	27.58	ft
Total Well Depth:	-	ft
Well Volume:	-	liters
Depth to Top of Pump:	35.16	ft
Water Level After Sample:	27.66	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:	20
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	4 OCT 17	Time Purging Began:	0946 am/pm	
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	- am/pm
Sample Date:	4 OCT 17	Time of Sampling:	1026 am/pm	
Bottle List:	1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sulfuric			

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	0951	8.65	9155	6.54	8.04	283.0	4.23	27.71	500	cl
2	1006	8.84	9153	6.54	2.10	281.6	3.64	27.66	1500	cl
3	1011	8.51	9136	6.54	1.89	281.0	2.24	27.66	500	cl
4	1016	8.89	9137	6.53	1.60	280.5	1.52	27.65	500	cl
5	1021	8.74	9123	6.54	1.63	280.0	1.51	27.65	500	cl
6	1026	8.62	9132	6.54	1.71	280.0	1.62	27.66	500	cl
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 Heskett
Event: 2017
Sample ID: 13
Sampling Personal: *Darren Niesman*

Weather Conditions: Temp: 42 °F Wind: W10 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 checked="" type="checkbox"/>	Not Visible
Repairs Necessary:	-	
Casing Diameter:	2"	
Water Level Before Purge:	30.62	ft
Total Well Depth:	=	ft
Well Volume:		liters
Depth to Top of Pump:	=	ft
Water Level After Sample:	31.12	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:	<i>Rep-1</i>	Pumping Rate: 100 mL/min
Purge Date:	4 Oct 17	Time Purging Began: 1057 am/pm
Well Purged Dry?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Time Purged Dry: - am/pm
Sample Date:	4 Oct 17	Time of Sampling: 1132 am/pm
Bottle List:	1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sulfuric	

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	1102	8.98	10700	6.87	4.45	296.1	12.1	30.99	500	clear
2	1117	8.66	10550	6.84	2.80	295.0	2.05	31.02	1500	clear
3	1122	8.85	10527	6.84	2.65	294.6	1.24	31.02	500	clear
4	1127	8.90	10468	6.84	2.68	294.3	1.17	31.08	500	clear
5	1132	8.84	10339	6.86	2.85	294.2	1.28	31.11	500	clear
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 3500 mL

2H 6.84



2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
 Event: 2017
 Sample ID: 70
 Sampling Personal: *Darren Wisway*

Weather Conditions: Temp: *45* °F Wind: *W10* 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:	<i>21.49</i>		ft
Total Well Depth:	=		ft
Well Volume:	=		liters
Depth to Top of Pump:	=		ft
Water Level After Sample:	<i>22.06</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>75</i> sec.
Duplicate Sample?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	PSI:	<i>20</i>
Duplicate Sample ID:	_____		Pumping Rate:	<i>100</i> mL/min
Purge Date:	<i>4 Oct 17</i>	Time Purging Began:	<i>1354</i>	am/pm <input checked="" type="checkbox"/>
Well Purged Dry?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Time Purged Dry:	_____ am/pm
Sample Date:	<i>4 Oct 17</i>	Time of Sampling:	<i>1419</i>	am/pm <input checked="" type="checkbox"/>
Bottle List:	1L Raw, 500mL Nitric, 500mL Nitric (filtered), 250 mL Sulfuric			

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	
	<i>1359</i>	<i>11.46</i>	<i>4658</i>	<i>6.96</i>	<i>2.41</i>	<i>99.7</i>	<i>0.97</i>	<i>21.94</i>	<i>500</i>	<i>clear</i>
	<i>1404</i>	<i>11.32</i>	<i>4629</i>	<i>6.96</i>	<i>1.56</i>	<i>105.4</i>	<i>0.41</i>	<i>22.04</i>	<i>500</i>	<i>clear</i>
	<i>1409</i>	<i>11.40</i>	<i>4616</i>	<i>6.96</i>	<i>1.15</i>	<i>110.8</i>	<i>0.47</i>	<i>22.04</i>	<i>500</i>	<i>clear</i>
	<i>1414</i>	<i>11.80</i>	<i>4612</i>	<i>6.96</i>	<i>1.16</i>	<i>114.9</i>	<i>0.40</i>	<i>22.04</i>	<i>500</i>	<i>clear</i>
	<i>1419</i>	<i>11.94</i>	<i>4618</i>	<i>6.96</i>	<i>1.18</i>	<i>120.0</i>	<i>0.39</i>	<i>22.04</i>	<i>500</i>	<i>clear</i>

Stabilized: Yes No

Comments: _____

Total Volume Removed: *2500* mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2017
Sample ID: 101
Sampling Personal: Damen Nieswazy

Weather Conditions: Temp: 50 °F Wind: WS Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	
Well Labeled?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	
Casing Straight?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	
Grout Seal Intact?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Not Visible
Repairs Necessary:	<input checked="" type="checkbox"/>		
Casing Diameter:	2"		
Water Level Before Purge:	36.54 ft		
Total Well Depth:	-		
Well Volume:	-		
Depth to Top of Pump:	-		
Water Level After Sample:	-		
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 <input type="radio"/>	Recover:	55 sec.
Duplicate Sample?:	Yes <input type="radio"/>	No <input checked="" type="radio"/>	PSI:	25
Duplicate Sample ID:	-		Pumping Rate:	100 mL/min
Purge Date:	4/04/17	Time Purging Began:	1449	am/pm
Well Purged Dry?	Yes <input checked="" type="radio"/>	No <input type="radio"/>	Time Purged Dry:	- am/pm
Sample Date:	4/04/17	Time of Sampling:	1559	am/pm
Bottle List:	1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sulfuric			

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: 700 mL

Comments:



Laboratories, Inc.

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

Chain of Custody Record

Project Name: MDU Heskett	Event: October 2017	Work Order Number: 82-2789
Report To: MDU Attn: Samantha Marshall Address: 400 N. 4th St Bismarck, ND 58501 phone: 701-222-7829 email:	Carbon Copy: Attn: Address:	Name of Sampler(s): Darren Nieswaag

Lab Number	Sample ID	Date	Time	Sample Type	Bottle Type				Field Parameters			Analysis Required	
					1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric	Temp (°C)	Spec. Cond.	pH		
W4292	103	4 Oct 17	0919	GW	X	X	X	X		8.49	5055	6.68	MDU Appendix III & List AA
W4293	44R	4 Oct 17	1026	GW	X	X	X	X		8.62	9132	6.54	
W4294	13	4 Oct 17	1132	GW	X	X	X	X		8.84	10339	6.86	
W4295	Dup-1	4 Oct 17	-	GW	X	X	X	X		-	-	-	
W4296 DN	103 102	4 Oct 17	1324	GW	X	X	X	X		10.03	7741	6.82	
W4297	70	4 Oct 17	1419	GW	X	X	X	X		11.94	4618	6.96	
W4298	101	4 Oct 17	1559	GW	X	X	X	X		10.89	4829	6.68	
W4299	FB 1	4 Oct 17	-	-	X	X	X	X		-	-	-	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
<i>[Signature]</i>	4 Oct 17 1650	Log In <u>Waik In #2</u>	ROJ 4.2 <u>TM562 / TM588</u>

Received by:	
Name:	Date/Time
<i>[Signature]</i>	05 Oct 17 0800



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-2797
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR October 2017
MVTL Laboratory Identifications: 17-W4311 through 17-W4318
Page 1 of 2

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include samples 33, 3-90, Dup-2, 2-90, 104, 80R, 105, and FB2.

I. RECEIPT

- All samples were received at the laboratory on 6 Oct 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 4.2°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.
Due to a login error, total dissolved solids was not assigned to the samples at sample receipt. Per email and telephone conversation with Samantha Marshall (MDU), total dissolved solids analysis was added to the samples and analyzed beyond hold time. The sample sites were be recollected again at a later date and analyzed for total dissolved solids.

III. METHODS

- Approved methodology was followed for all sample analyses.
Method 6010D was used to analyze the metals.



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-2797
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR October 2017
MVTL Laboratory Identifications: 17-W4311 through 17-W4318
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 analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
 - Recovery for one sulfate 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: 10 NOV 17
Claudette Carroll - MVTL Bismarck Laboratory Manager

Quality Control Report

Lab IDs: 17-W4311 to 17-W4318

Project: MDU Heskett - CCR

Work Order: 201782-2797

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	98	80-120	0.400	17-W4313	< 0.1	0.47	118	75-125	0.47	0.47	118	0.0	20	-	-	< 0.1
Calcium - Total mg/l	20.0	106	80-120	100	17W4304q	5.8	104	98	75-125	104	106	100	1.9	20	-	-	< 1
	20.0	104	80-120	500	17W4312q	500	995	99	75-125	995	1020	104	2.5	20	-	-	< 1
				500	17W4313q	480	985	101	75-125	985	985	101	0.0	20	-	-	< 1
Chloride mg/l	30.0	89	80-120	30.0	17-W4261	24.6	53.6	97	80-120	53.6	52.8	94	1.5	20	-	-	< 1
	30.0	91	80-120	30.0	17-W4318	< 1	26.8	89	80-120	26.8	25.6	85	4.6	20	-	-	< 1
	30.0	89	80-120												-	-	< 1
	30.0	90	80-120												-	-	< 1
Fluoride mg/l	0.50	94	90-110	0.500	17-W4311	0.22	0.65	86	80-120	0.65	0.66	88	1.5	20	-	-	< 0.1
				0.500	17-W4314	0.93	1.36	86	80-120	1.36	1.37	88	0.7	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	-	-	12.2	12.1	-	0.8	20	-	-	-
	-	-	-	-	-	-	-	-	-	7.4	7.5	-	1.3	20	-	-	-
Sulfate mg/l	100	93	80-120	4000	17-W4299	< 200	3730	93	80-120	3730	3610	90	3.3	20	-	-	< 5
	100	89	80-120	4000	17-W4316	2960	7040	102	80-120	7040	6920	99	1.7	20	-	-	< 5
	100	100	80-120	500	17-D3526	339	731	78	80-120	731	739	80	1.1	20	-	-	< 5
	100	102	80-120	2000	17-D3894	1220	2920	85	80-120	2920	3150	96	7.6	20	-	-	< 5
Total Dissolved Solids mg/l	-	-	-	-	-	-	-	-	-	35000	34100	-	2.6	20	-	-	< 10

Approved by: C. [Signature]

10 NOV 17



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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 9 Nov 17
Lab Number: 17-W4311
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17 9:40
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 33

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.58	units	NA	SM 4500 H+ B	5 Oct 17 9:40	DJN
pH	* 6.9	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	9.71	Degrees C	NA	SM 2550B	5 Oct 17 9:40	DJN
Conductivity - Field	4952	umhos/cm	1	EPA 120.1	5 Oct 17 9:40	DJN
Fluoride	0.22	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	2790	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	11.9	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 4720	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	481	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.30	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
9 NOV 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: 9 Nov 17
Lab Number: 17-W4312
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17 10:34
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 3-90

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.88	units	NA	SM 4500 H+ B	5 Oct 17 10:34	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	9.49	Degrees C	NA	SM 2550B	5 Oct 17 10:34	DJN
Conductivity - Field	4859	umhos/cm	1	EPA 120.1	5 Oct 17 10:34	DJN
Fluoride	0.12	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	2410	mg/l	5.00	ASTM D516-07	10 Oct 17 15:31	RAG
Chloride	37.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 4400	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	500	mg/l	1.0	6010D	16 Oct 17 13:30	SZ
Boron - Total	0.11	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll

*CC
9 NOV 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: 9 Nov 17
Lab Number: 17-W4313
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: Dup-2

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Fluoride	0.12	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	2380	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG
Chloride	36.7	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 4380	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	480	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} 9 NOV 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 St
Bismarck ND 58501

Report Date: 9 Nov 17
Lab Number: 17-W4314
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17 11:53
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 2-90

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.97	units	NA	SM 4500 H+ B	5 Oct 17 11:53	DJN
pH	* 7.4	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	9.16	Degrees C	NA	SM 2550B	5 Oct 17 11:53	DJN
Conductivity - Field	7456	umhos/cm	1	EPA 120.1	5 Oct 17 11:53	DJN
Fluoride	0.93	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	4280	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG
Chloride	73.3	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 7330	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	488	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.5 @	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll 9 NOV 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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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 9 Nov 17
Lab Number: 17-W4315
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17 13:55
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 104

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.94	units	NA	SM 4500 H+ B	5 Oct 17 13:55	DJN
pH	* 7.4	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	12.0	Degrees C	NA	SM 2550B	5 Oct 17 13:55	DJN
Conductivity - Field	14044	umhos/cm	1	EPA 120.1	5 Oct 17 13:55	DJN
Fluoride	0.50	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	10200	mg/l	5.00	ASTM D516-07	10 Oct 17 16:14	RAG
Chloride	99.6	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 15300	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	430	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	0.81	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll ^{CC} 9 NOV 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 St
Bismarck ND 58501

Report Date: 9 Nov 17
Lab Number: 17-W4317
Work Order #: 82-2797
Account #: 002800
Date Sampled: 5 Oct 17 16:00
Date Received: 6 Oct 17 8:00
Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: 105

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH - Field	6.76	units	NA	SM 4500 H+ B	5 Oct 17 16:00	DJN
pH	* 7.2	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Temperature - Field	11.9	Degrees C	NA	SM 2550B	5 Oct 17 16:00	DJN
Conductivity - Field	6514	umhos/cm	1	EPA 120.1	5 Oct 17 16:00	DJN
Fluoride	0.24	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	3310	mg/l	5.00	ASTM D516-07	31 Oct 17 12:28	EMS
Chloride	346	mg/l	1.0	SM4500-Cl-E	11 Oct 17 14:40	RAG
Total Dissolved Solids	* 6290	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	367	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.5 @	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

Claudette K. Carroll

CC
9 NOV 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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CERTIFICATE of ANALYSIS - CCR

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

Report Date: 9 Nov 17
 Lab Number: 17-W4318
 Work Order #: 82-2797
 Account #: 002800
 Date Sampled: 5 Oct 17
 Date Received: 6 Oct 17 8:00
 Sampled By: MVTL Field Services

Project Name: MDU Heskett

PO #: 165275

Sample Description: FB2

Temp at Receipt: 4.2C ROI

Event and Year: October 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
pH	* 6.3	units	0.1	SM4500 H+ B	9 Oct 17 17:00	SVS
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Sulfate	< 5	mg/l	5.00	ASTM D516-07	26 Oct 17 8:11	EMS
Chloride	< 1	mg/l	1.0	SM4500-Cl-E	11 Oct 17 15:17	RAG
Total Dissolved Solids	* < 10	mg/l	10	I1750-85	3 Nov 17 16:30	SVS
Calcium - Total	< 1	mg/l	1.0	6010D	16 Oct 17 14:30	SZ
Boron - Total	< 0.1	mg/l	0.10	6010D	1 Nov 17 13:09	SZ

* Holding time exceeded

Approved by:

C
Claudette K. Carroll *9 NOV 17*

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2017
Sample ID: ~~30~~ 33
Sampling Personal: Darren Miesnaag

Weather Conditions: Temp: 46 °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:	2"		
Water Level Before Purge:	41.48		ft
Total Well Depth:	—		ft
Well Volume:	—		liters
Depth to Top of Pump:	—		ft
Water Level After Sample:	41.72		ft
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		Control Settings
Sampling Method:	Bladder		Purge: 5 sec.
Dedicated Equip?:	<u>Yes</u>	No	Recover: 55 sec.
Duplicate Sample?:	Yes	<u>No</u>	PSI: 20
Duplicate Sample ID:	—		Pumping Rate: 100 mL/min
Purge Date:	5/07/17	Time Purging Began:	0830 am/pm
Well Purged Dry?	Yes	<u>No</u>	Time Purged Dry: — am/pm
Sample Date:	5/07/17	Time of Sampling:	0940 am/pm
Bottle List:	1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 250 mL Sulfuric		

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	0835	9.94	5213	6.88	8.38	45.2	85.1	41.58	500	slightly turbid
2	0905	9.67	4969	6.59	2.26	60.5	26.9	41.70	3000	clear
3	0920	9.70	4956	6.58	2.15	61.5	8.18	41.70	1500	clear
4	0930	9.75	4945	6.58	2.05	64.2	2.66	41.71	9000	clear
5	0935	9.73	4950	6.58	2.01	64.9	2.51	41.73	500	clear
6	0940	9.71	4952	6.58	2.06	66.7	2.53	41.71	500	clear
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 7000 mL

Had to pull pump check ball got stuck.



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett

Event: 2017

Sample ID: 3-90

Sampling Personal: *Parlen Nieswaag*

Weather Conditions: Temp: *50* °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 type="checkbox"/>	No <input type="checkbox"/>	<i>Not Visible</i>
Repairs Necessary:			
Casing Diameter:	<i>2"</i>		
Water Level Before Purge:	<i>19.80</i> ft		
Total Well Depth:	<i>-</i> ft		
Well Volume:	<i>-</i> liters		
Depth to Top of Pump:	<i>-</i> ft		
Water Level After Sample:	<i>19.88</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>20</i>
Duplicate Sample ID:	<i>Dup-2</i>		Pumping Rate:	<i>100</i> mL/min
Purge Date:	<i>5 Oct 17</i>	Time Purging Began:	<i>1009</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>5 Oct 17</i>	Time of Sampling:	<i>1034</i> am/pm	
Bottle List:	1L Raw, 500mL Nitric, 500mL Nitric (filtered), 250 mL Sulfuric			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription:	
									Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
1	<i>1014</i>	<i>8.73</i>	<i>4857</i>	<i>6.86</i>	<i>4.30</i>	<i>42.5</i>	<i>1.20</i>	<i>19.86</i>	<i>500</i>	<i>cl</i>
2	<i>1019</i>	<i>8.96</i>	<i>4829</i>	<i>6.87</i>	<i>2.81</i>	<i>42.5</i>	<i>1.82</i>	<i>19.88</i>	<i>500</i>	<i>cl</i>
3	<i>1024</i>	<i>9.14</i>	<i>4860</i>	<i>6.88</i>	<i>2.78</i>	<i>56.1</i>	<i>0.67</i>	<i>19.90</i>	<i>500</i>	<i>cl</i>
4	<i>1029</i>	<i>9.37</i>	<i>4860</i>	<i>6.89</i>	<i>2.83</i>	<i>62.3</i>	<i>0.71</i>	<i>19.87</i>	<i>500</i>	<i>cl</i>
5	<i>1034</i>	<i>9.49</i>	<i>4859</i>	<i>6.88</i>	<i>2.77</i>	<i>64.3</i>	<i>0.64</i>	<i>19.87</i>	<i>500</i>	<i>cl</i>
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: *2500* mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2017
Sample ID: 2-90
Sampling Personal: Darren Nierwaag

Weather Conditions: Temp: 50°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:	<u>2</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>21.81</u>	ft	
Total Well Depth:	<u>-</u>	ft	
Well Volume:	<u>-</u>	liters	
Depth to Top of Pump:	<u>-</u>	ft	
Water Level After Sample:	<u>22.18</u>	ft	
Measurement Method:	<u>Electric Water Level Indicator</u>		

Sampling Information

Purging Method:	<u>Bladder</u>	Control Settings
Sampling Method:	<u>Bladder</u>	Purge: <u>5</u> sec.
Dedicated Equip?:	<u>Yes</u> No	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <u>No</u>	PSI: <u>10</u>
Duplicate Sample ID:	<u>-</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>5/04/17</u>	Time Purging Began: <u>1123</u> am/pm
Well Purged Dry?:	Yes <u>No</u>	Time Purged Dry: <u>-</u> am/pm
Sample Date:	<u>5/04/17</u>	Time of Sampling: <u>1153</u> am/pm
Bottle List:	<u>1L Raw, 500mL Nitric, 500mL Nitric (filtered), 250 mL Sulfuric</u>	

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. clear, slightly turbid, turbid
2	1133	9.28	7550	6.96	5.71	237.0	1.39	22.18	500	<u>clear</u>
3	1138	9.29	7531	6.97	5.00	236.9	1.25	22.18	500	<u>cl</u>
4	1143	9.22	7509	6.96	4.71	241.6	0.59	22.18	500	<u>cl</u>
5	1148	9.16	7477	6.97	4.64	247.5	0.56	22.18	500	<u>cl</u>
6	1153	9.16	7456	6.97	4.53	249.8	0.51	22.18	500	<u>cl</u>
7					4.53					
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 7000 mL

Comments:



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

Field Datasheet

Groundwater Assessment

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

Weather Conditions: Temp: 55 °F Wind: E/NE 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:	13.82	ft
Total Well Depth:	-	ft
Well Volume:	-	liters
Depth to Top of Pump:	-	ft
Water Level After Sample:	14.08	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: <u>5</u> sec.
Dedicated Equip?:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recover: <u>55</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>20</u>
Duplicate Sample ID:	-	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>5 Oct 17</u>	Time Purging Began: <u>1315</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>5 Oct 17</u>	Time of Sampling: <u>1355</u> am/pm
Bottle List:	1L Raw, 500mL Nitric, 500mL Nitric (filtered), 250 mL Sulfuric	

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	1320	12.16	14075	6.95	3.02	284.1	1.13	14.00	500	clear
2	1325	11.99	14057	6.94	2.06	283.3	1.11	14.08	500	cl
3	1330	12.06	14050	6.92	2.80	282.4	0.80	14.08	500	cl
4	1335	12.00	14065	6.94	0.86	281.1	0.86	14.08	500	cl
5	1340	12.52	14058	6.93	0.93	279.4	0.80	14.08	500	cl
6	1345	12.45	14064	6.94	0.89	277.5	0.44	14.08	500	cl
7	1350	12.12	14062	6.93	0.93	276.7	0.47	14.08	500	cl
8	1355	12.01	14044	6.94	0.93	275.5	0.41	14.08	500	cl
9										
10										

Stabilized: Yes No

Total Volume Removed: 4000 mL

Comments: (circled)



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2017
Sample ID: 105
Sampling Personal: *Parrin Nieswong*

Weather Conditions: Temp: *58* °F Wind: *W 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:	<i>_____</i>	
Casing Diameter:	2"	
Water Level Before Purge:	<i>13.14</i>	ft
Total Well Depth:		ft
Well Volume:	<i>-</i>	liters
Depth to Top of Pump:	<i>-</i>	ft
Water Level After Sample:	<i>13.24</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 type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <i>5</i>
Duplicate Sample ID:	<i>_____</i>	Pumping Rate: <i>100</i> mL/min
Purge Date:	<i>5 Oct 17</i>	Time Purging Began: <i>1525</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>5 Oct 17</i>	Time of Sampling: <i>1600</i> am/pm
Bottle List:	1L Raw, 500mL Nitric, 500mL Nitric (filtered), 250 mL Sulfuric	

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. clear, slightly turbid, turbid
2	<i>1535</i>	<i>11.65</i>	<i>5710</i>	<i>6.79</i>	<i>1.00</i>	<i>282.8</i>	<i>3.15</i>	<i>13.21</i>	<i>500</i>	<i>clear</i>
3	<i>1540</i>	<i>11.48</i>	<i>5732</i>	<i>6.79</i>	<i>0.78</i>	<i>281.4</i>	<i>2.23</i>	<i>13.20</i>	<i>500</i>	<i>clear</i>
4	<i>1545</i>	<i>11.34</i>	<i>5896</i>	<i>6.79</i>	<i>0.55</i>	<i>278.0</i>	<i>2.32</i>	<i>13.23</i>	<i>500</i>	<i>clear</i>
5	<i>1550</i>	<i>11.38</i>	<i>6104</i>	<i>6.78</i>	<i>0.45</i>	<i>275.9</i>	<i>2.82</i>	<i>13.23</i>	<i>500</i>	<i>clear</i>
6	<i>1555</i>	<i>11.68</i>	<i>6325</i>	<i>6.77</i>	<i>0.43</i>	<i>273.5</i>	<i>3.00</i>	<i>13.23</i>	<i>500</i>	<i>clear</i>
7	<i>1600</i>	<i>11.89</i>	<i>6514</i>	<i>6.76</i>	<i>0.39</i>	<i>272.2</i>	<i>2.92</i>	<i>13.23</i>	<i>500</i>	<i>clear</i>
8										
9										
10										

Stabilized: *Yes* No
Comments: *_____*

Total Volume Removed: *3500* mL

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Parron Niesway

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	4 Oct 17		Time:	0740		
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		18.64	7.03	7.00	6.95-7.05	-23.6
Buffer 10		19.83	9.98	10.00	9.95-10.05	-200.6
Conductivity						Check
Buffer 10000		19.79	10230	10002	±10%	Buffer 5000 4983
ORP						
231 mV @ 25C		11.46	239.4	231.2	±10 mV	
DO						
		13.73	7.78	9.89	Barometric Pressure (mm Hg)	725.7
					mg/L	

Post Site Check			
Time:	1602		
	pH	Temp °C	Reading
Buffer 7		17.57	6.98
Conductivity			
Buffer 5000		17.97	4977

Pre Site Calibration						
Date:	5 Oct 17		Time:	0720		
	pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv Range +/- 50
Buffer 7		20.59	6.94	7.00	6.95-7.05	-20.2
Buffer 10		20.56	10.01	10.00	9.95-10.05	-198.2
Conductivity						Check
Buffer 10000		20.27	10048	10999	±10%	Buffer 5000 4992
ORP						
231 mV @ 25C		9.49	233.7	231.2	±10 mV	
DO						
		19.78	9.97	8.61	Barometric Pressure (mm Hg)	719.8
					mg/L	

Post Site Check			
Time:	1604		
	pH	Temp °C	Reading
Buffer 7		18.98	7.03
Conductivity			
Buffer 5000		19.22	4973

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

Chain of Custody Record

Project Name: MDU Heskett	Event: October 2017	Work Order Number: 82-2797
Report To: MDU 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 Nieswaag</i>

Lab Number	Sample ID	Date	Time	Sample Type	Bottle Type				Field Parameters			Analysis Required	
					1 liter	500mL Nitric	500mL Nitric (filtered)	250 mL Sulfuric	Temp (°C)	Spec. Cond.	pH		
W4311	33	5 Oct 17	0940	GW	X	X	X	X		9.71	4952	6.58	MDU Appendix III & List AA
W4312	3-90	5 Oct 17	1034	GW	X	X	X	X		9.49	4859	6.88	
W4313	Dup-2	5 Oct 17	-	GW	X	X	X	X		-	-	-	
W4314	2-90	5 Oct 17	1153	GW	X	X	X	X		9.16	7456	6.97	
W4315	104	5 Oct 17	1355	GW	X	X	X	X		12.01	14044	6.94	
W4316	80R	5 Oct 17	1459	GW	X	X	X	X		12.03	5656	7.10	
W4317	105	5 Oct 17	1600	GW	X	X	X	X		11.89	6514	6.76	
W4318	FB2	5 Oct 17	-	-	X	X	X	X		-	-	-	

Comments:

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
1 <i>Darren Nieswaag</i>	5 Oct 17 1654	Log In <u>Walk In #2</u>	ROE 4.2 TM562 / TM588
2			

Received by:	
Name:	Date/Time
<i>M. Buchmann</i>	6 Oct 17 0300



CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-3145
Client: Montana Dakota Utilities
Location: MDU Heskett
Project Identification: CCR November 2017
MVTL Laboratory Identifications: 17-W5141 through 17-W5148
Page 1 of 1

Table with 2 columns: MDU Sample Identification and MVTL Laboratory #. Rows include samples 33, 3-90, Dup-2, 2-90, 104, 80R, 105, and FB2.

I. RECEIPT

- All samples were received at the laboratory on 6 Nov 17 at 1413.
Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
These samples were submitted as replacement samples for samples submitted in Oct 2017 (201782-2797) where the TDS analysis exceeded hold time due to an error at sample receipt/login.
Samples were received on ice and evidence of cooling had begun.
Temperature of samples upon receipt was 5.0°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

- All holding times were met for both preparation and analysis unless noted here.

III. METHODS

- Approved methodology was followed for all sample analyses.

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Claudette Carroll DATE: 17 NOV 17
Claudette Carroll - MVTL Bismarck Laboratory Manager

Quality Control Report

Lab IDs: 17-W5141 to 17-W5148

Project: MDU Heskett - CCR

Work Order: 201782-3145

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	-	-	-	-	-	-	-	-	-	6650	6950	-	4.4	20	-	-	< 10

Approved by: C. Casper
 14 NOV 17



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: 14 Nov 17
 Lab Number: 17-W5141
 Work Order #: 82-3145
 Account #: 002800
 Date Sampled: 6 Nov 17 9:07
 Date Received: 6 Nov 17 14:13
 Sampled By: MVTL Field Services

Project Name: MDU Heskett
 Sample Description: 33

Temp at Receipt: 5.0C ROI

Event and Year: November 2017

	As Received Result		Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.33	units	NA	SM 4500 H+ B	6 Nov 17 9:07		JSM
Temperature - Field	6.31	Degrees C	NA	SM 2550B	6 Nov 17 9:07		JSM
Conductivity - Field	4859	umhos/cm	1	EPA 120.1	6 Nov 17 9:07		JSM
Total Dissolved Solids	4670	mg/l	10	I1750-85	8 Nov 17 10:56		SVS

Approved by:

Claudette K. Carroll

CC

14 NOV 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: 14 Nov 17
 Lab Number: 17-W5142
 Work Order #: 82-3145
 Account #: 002800
 Date Sampled: 6 Nov 17 10:00
 Date Received: 6 Nov 17 14:13
 Sampled By: MVTL Field Services

Project Name: MDU Heskett
 Sample Description: 3-90

Temp at Receipt: 5.0C ROI

Event and Year: November 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.71	units	NA	SM 4500 H+ B	6 Nov 17 10:00	JSM
Temperature - Field	6.71	Degrees C	NA	SM 2550B	6 Nov 17 10:00	JSM
Conductivity - Field	4815	umhos/cm	1	EPA 120.1	6 Nov 17 10:00	JSM
Total Dissolved Solids	4340	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

Approved by:

CC
Claudette K. Carroll *14 Nov 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: 14 Nov 17
Lab Number: 17-W5146
Work Order #: 82-3145
Account #: 002800
Date Sampled: 6 Nov 17 12:34
Date Received: 6 Nov 17 14:13
Sampled By: MVTL Field Services

Project Name: MDU Heskett
Sample Description: 80R

Temp at Receipt: 5.0C ROI

Event and Year: November 2017

	As Received Result	units	Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.95	units	NA	SM 4500 H+ B	6 Nov 17 12:34	JSM
Temperature - Field	8.39	Degrees C	NA	SM 2550B	6 Nov 17 12:34	JSM
Conductivity - Field	5617	umhos/cm	1	EPA 120.1	6 Nov 17 12:34	JSM
Total Dissolved Solids	5000	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

Approved by:

Claudette K. Carroll 14 NOV 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: 14 Nov 17
Lab Number: 17-W5147
Work Order #: 82-3145
Account #: 002800
Date Sampled: 6 Nov 17 13:37
Date Received: 6 Nov 17 14:13
Sampled By: MVTL Field Services

Project Name: MDU Heskett
Sample Description: 105

Temp at Receipt: 5.0C ROI

Event and Year: November 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
pH - Field	6.60	units	NA	SM 4500 H+ B	6 Nov 17 13:37	JSM
Temperature - Field	7.20	Degrees C	NA	SM 2550B	6 Nov 17 13:37	JSM
Conductivity - Field	6991	umhos/cm	1	EPA 120.1	6 Nov 17 13:37	JSM
Total Dissolved Solids	6650	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

Approved by:

C
Claudette K. Carroll 14 NOV 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: 8 of 8

CERTIFICATE of ANALYSIS - CCR

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

Report Date: 14 Nov 17
Lab Number: 17-W5148
Work Order #: 82-3145
Account #: 002800
Date Sampled: 6 Nov 17
Date Received: 6 Nov 17 14:13
Sampled By: MVTL Field Services

Project Name: MDU Heskett
Sample Description: FB2

Temp at Receipt: 5.0C ROI

Event and Year: November 2017

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Total Dissolved Solids	< 10	mg/l	10	I1750-85	8 Nov 17 10:56	SVS

Approved by:

C
Claudette K. Carroll 14 Nov 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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November 9, 2017

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

RE: Groundwater Sampling Event - MDU Heskett Ash Site

Dear Ms. Marshall:

On November 6, 2017, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule.

Re-sampling was conducted on 6 wells for TDS due to a log in error at the lab. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer
MVTL Field Services

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Jerry Ob

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	Time:					
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	18.02	7.02	7.00	6.95-7.05	-33.8	0 +/- 50
Buffer 10	17.83	9.95	10.00	9.95-10.05	-207.6	-180 +/- 50
Conductivity						Check
Buffer 10000	17.83	10166	10002	±10%	Buffer 5000	4984
ORP						
231 mV @ 25C	8.02	253.7	250.8	±10 mV		
DO						
	17.43	108.0	101.7	Barometric Pressure (mm Hg)		
				mg/L	773.00	

Post Site Check		
Time:	1300	
pH	Temp °C	Reading
Buffer 7	18.16	7.01
Conductivity		
Buffer 5000	17.91	4976

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 10000				±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 5000		

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

Project Name: MDU Heskett	Event: November 2017	Work Order Number: 82-3145
Report To: MDU 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>Jeremy [Signature]</i>

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	
WS141	33	6 Nov 17	0907	GW	X			6.31	4859	6.33	TDS
WS142	3-90	6 Nov 17	1000	GW	X			6.71	4815	6.71	
WS143	Dup2	6 Nov 17	NA	GW	X			—	—	—	
WS144	2-90	6 Nov 17	1102	GW	X			6.86	7415	6.88	
WS145	104	6 Nov 17	1155	GW	X			7.60	14134	6.82	
WS146	BOR	6 Nov 17	1234	GW	X			8.39	5617	6.95	
WS147	105	6 Nov 17	1337	GW	X			7.20	6991	6.60	
WS148	FBZ	6 Nov 17	NA	GW	X			—	—	—	
				W	X						

Comments: resample

Relinquished By:		Sample Condition:	
Name:	Date/Time	Location:	Temp (°C)
<i>[Signature]</i>	6 Nov 17 1413	Log In Walk In #2	50 TM562 / TM588
1			
2			

Received by:	
Name:	Date/Time
<i>[Signature]</i>	6 Nov 2017 1413



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



October 14, 2016

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

RE: Groundwater Sampling Event- MDU Heskett Ash Site

Dear Ms. Marshall:

From October 12-13, 2016, MVTL Laboratories' Field Services division collected groundwater samples at the MDU Heskett site near Mandan, ND for the Heskett Coal Combustion Rule analytical list. All wells were located and were found to be in generally good condition. The wells for CCR were purged and sampled using a dedicated bladder pump and BARR's SOP for low flow purging and sampling. The samples collected were, placed on ice and transported back to the MVTL laboratory in Bismarck, ND for analysis. The field data report for the sampling event accompanies this letter.

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

Sincerely,

Jeremy Meyer
MVTL Field Services



MVTI Laboratories Inc.
FIELD DATA REPORT

WO# 82-3374
82-3373

MDU Heskett
GROUNDWATER SAMPLING - NDDH
Attn: Samantha Marshall
400 N. 4th St
Bismarck, ND 58501
701-222-7829

WELL ID	PURGE DATE	START PURGE TIME	SAMPLE DATE	TIME OF SAMPLE	WELL CASING ELEVATION	STATIC WATER LEVEL (ft)	WATER LEVEL START	TOTAL DEPTH	WATER LEVEL END	VOLUME IN WELL (L)	VOLUME REMOVED (mL)	SAMPLE METHOD	TEMP (°C)	EC	pH	Turbidity NTU	SAMPLE APPEARANCE
2-90	13-Oct-16	11:19	13-Oct-16	11:49	1686.60	1664.88	21.72	24.80	NA*	1.9	3000.0	Bladder	8.29	7601	6.87	0.24	clear
3-90	12-Oct-16	9:47	12-Oct-16	10:12	1686.01	1666.46	19.55	21.93	19.63	1.5	2500.0	Bladder	7.60	5289	6.79	0.68	clear
13	13-Oct-16	7:53	13-Oct-16	8:13	1724.98	1694.46	30.52	41.90	31.13	7.0	2000.0	Bladder	7.39	10508	6.86	1.50	clear
33	13-Oct-16	8:05	13-Oct-16	8:45	1717.91	1675.59	42.32	46.55	42.84	2.6	4000.0	Bladder	7.32	5399	6.50	1.41	clear
70	12-Oct-16	13:22	12-Oct-16	13:47	1706.36	1684.74	21.62	43.06	24.30	13.2	2500.0	Bladder	8.32	3932	7.01	0.63	clear
80R	13-Oct-16	9:22	13-Oct-16	9:52	NA	NA	14.71	30.10	15.00	9.5	3000.0	Bladder	9.38	5683	7.12	1.62	clear
44R	12-Oct-16	7:47	12-Oct-16	8:07	NA	NA	28.71	45.88	28.82	10.6	2000.0	Bladder	7.52	8838	6.58	0.33	clear
101	12-Oct-16	14:35	12-Oct-16	15:55	NA	NA	37.12	57.09	42.60	12.3	8000.0	Bladder	9.12	4690	6.76	4.08	clear
102	12-Oct-16	10:51	12-Oct-16	11:41	NA	NA	18.13	33.20	22.81	9.3	5000.0	Bladder	8.82	7677	6.86	0.46	clear
103	12-Oct-16	9:07	12-Oct-16	9:42	NA	NA	33.25	47.10	37.36	8.5	3500.0	Bladder	7.83	4871	6.74	1.47	clear
104	13-Oct-16	12:50	13-Oct-16	13:15	NA	NA	14.46	32.85	14.67	11.3	2500.0	Bladder	10.56	14302	6.89	1.61	clear
105	13-Oct-16	11:22	13-Oct-16	11:57	NA	NA	13.44	32.39	13.70	11.7	3500.0	Bladder	8.85	7202	6.77	3.83	clear
1-90	NA	NA	13-Oct-16	12:35	1675.86	1664.07	11.79	17.02	NA	NA	NA	WL	NA	NA	NA	NA	Water Level Only

* not recorded during this sampling event

Ammended on 18 Nov 16



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett
 Event: 2016
 Sample ID: Mw 101
 Sampling Personal: Jeremy Meyer

Weather Conditions: Temp: 45 °F Wind: S @ 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:	37.12	ft
Total Well Depth:	ft	
Well Volume:	liters	
Depth to Top of Pump:	ft	
Water Level After Sample:	42.60	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"/> No <input type="checkbox"/>	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>35</u>
Duplicate Sample ID:	Pumping Rate: <u>100</u> mL/min	
Purge Date:	<u>12 Oct 16</u>	Time Purging Began: <u>1435</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>12 Oct 16</u>	Time of Sampling: <u>1555</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	1440	9.14	4673	6.77	3.35	34.8	212.0	38.35	500	Clear
2	1455	8.93	4654	6.76	2.41	12.8	31.7	39.58	1500	Clear
3	1450 ⁵¹⁰	8.97	4646	6.76	2.53	18.3	13.2	40.07	1500	Clear
4	1455 ⁵²⁵	9.12	4662	6.76	2.70	21.3	14.6	40.73	1500	Clear
5	1530	9.07	4676	6.75	2.72	25.2	11.5	40.89	500	Clear
6	1535	8.99	4680	6.75	2.67	24.2	8.75	41.05	500	Clear
7	1540	9.05	4678	6.76	2.68	21.4	7.23	41.24	500	Clear
8	1545	9.01	4682	6.76	2.64	18.4	5.92	41.40	500	Clear
9	1550	9.04	4687	6.76	2.62	15.2	4.70	41.48	500	Clear
10	1555	9.12	4690	6.76	2.60	13.6	4.08	41.58	500	Clear

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 Heskett
 Event: 2016
 Sample ID: MW102
 Sampling Personal: Jason Meyer

Weather Conditions: Temp: 45 °F Wind: N 05-10 Precip: Sunny / Partly Cloudy / ~~Cloudy~~

Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	Yes No	
Casing Straight?	Yes No	
Grout Seal Intact?	Yes No	Not Visible
Repairs Necessary:		
Casing Diameter:	2"	
Water Level Before Purge:	<u>18.13</u>	ft
Total Well Depth:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>22.81</u>	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 No	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes No	PSI: <u>20</u>
Duplicate Sample ID:	<u>Du1</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>12 Oct 16</u>	Time Purging Began: <u>1051</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 Oct 16</u>	Time of Sampling: <u>1141</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	<u>1056</u>	<u>8.74</u>	<u>9510</u>	<u>6.91</u>	<u>2.44</u>	<u>-46.4</u>	<u>3.38</u>	<u>19.16</u>	<u>500</u>	<u>Clear</u>
2	<u>1101</u>	<u>8.77</u>	<u>9438</u>	<u>6.87</u>	<u>2.44</u>	<u>-43.8</u>	<u>3.62</u>	<u>19.49</u>	<u>500</u>	<u>Clear</u>
3	<u>1106</u>	<u>8.84</u>	<u>9179</u>	<u>6.83</u>	<u>2.49</u>	<u>-30.6</u>	<u>2.32</u>	<u>19.64</u>	<u>500</u>	<u>Clear</u>
4	<u>1111</u>	<u>8.88</u>	<u>8914</u>	<u>6.82</u>	<u>2.51</u>	<u>-27.8</u>	<u>1.93</u>	<u>19.94</u>	<u>500</u>	<u>Clear</u>
5	<u>1116</u>	<u>8.90</u>	<u>8681</u>	<u>6.81</u>	<u>2.52</u>	<u>-27.0</u>	<u>1.44</u>	<u>20.04</u>	<u>500</u>	<u>Clear</u>
6	<u>1121</u>	<u>8.93</u>	<u>8377</u>	<u>6.81</u>	<u>2.56</u>	<u>-28.1</u>	<u>0.85</u>	<u>20.26</u>	<u>500</u>	<u>Clear</u>
7	<u>1126</u>	<u>8.97</u>	<u>7902</u>	<u>6.82</u>	<u>2.61</u>	<u>-29.9</u>	<u>0.63</u>	<u>20.56</u>	<u>500</u>	<u>Clear</u>
8	<u>1131</u>	<u>8.86</u>	<u>7573</u>	<u>6.84</u>	<u>3.07</u>	<u>-27.1</u>	<u>0.52</u>	<u>20.72</u>	<u>500</u>	<u>Clear</u>
9	<u>1136</u>	<u>8.83</u>	<u>7559</u>	<u>6.85</u>	<u>3.28</u>	<u>-24.6</u>	<u>0.48</u>	<u>20.80</u>	<u>500</u>	<u>Clear</u>
10	<u>1141</u>	<u>8.82</u>	<u>7677</u>	<u>6.86</u>	<u>3.27</u>	<u>-25.7</u>	<u>0.46</u>	<u>20.88</u>	<u>500</u>	<u>Clear</u>

Stabilized: Yes No

Total Volume Removed: 5000 mL

Comments:



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett

Event: 2016

Sample ID: MW103

Sampling Personal: Jerry [signature]

Weather Conditions: Temp: 40 °F Wind: NOS-10 Precip: Sunny / Partly Cloudy (Cloudy)

Well Information

Well Locked?	<u>Yes</u> No	
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:		<u>2"</u>
Water Level Before Purge:		<u>33.25</u> ft
Total Well Depth:		<u>—</u> ft
Well Volume:		<u>—</u> liters
Depth to Top of Pump:		<u>—</u> ft
Water Level After Sample:		<u>37.36</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?:	<u>Yes</u> No	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes No	PSI: <u>25</u>
Duplicate Sample ID:		Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>12 Oct 16</u>	Time Purging Began: <u>0907 am/pm</u>
Well Purged Dry?:	Yes <u>NO</u>	Time Purged Dry: <u>—</u> am/pm
Sample Date:	<u>12 Oct 16</u>	Time of Sampling: <u>0942 am/pm</u>
Bottle List:	<u>CCR: 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric</u>	

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
1	0912	7.80	4849	6.74	5.21	232.8	2.72	34.21	500	Clear
2	0917	7.76	4883	6.75	5.63	231.7	2.81	34.43	500	Clear
3	0922	7.84	4891	6.75	5.69	230.8	1.92	34.81	500	Clear
4	0927	7.81	4891	6.75	5.66	230.3	1.07	35.06	500	Clear
5	0932	7.79	4887	6.74	5.63	229.8	1.21	35.35	500	Clear
6	0937	7.76	4883	6.74	5.59	229.3	1.38	35.39	500	Clear
7	0942	7.83	4871	6.74	5.44	227.8	1.47	35.52	500	Clear
8										
9										
10										

Stabilized: Yes No

Total Volume Removed: 3500 mL

Comments:



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2016
Sample ID: PLW44R
Sampling Personal: Jeremy Meyer

Weather Conditions: Temp: 40 °F Wind: N05-10 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:	28.71	ft
Total Well Depth:		ft
Well Volume:		liters
Depth to Top of Pump:		ft
Water Level After Sample:	28.82	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder	Control Settings
Sampling Method:	Bladder	Purge: 4 sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Recover: 56 sec.
Duplicate Sample?:	Yes <input checked="" type="checkbox"/> No	PSI: 20
Duplicate Sample ID:		Pumping Rate: 100 mL/min
Purge Date:	12 Oct 16	Time Purging Began: 0747 am/pm
Well Purged Dry?:	Yes <input checked="" type="checkbox"/> No	Time Purged Dry: — am/pm
Sample Date:	12 Oct 16	Time of Sampling: 0807 am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Description: Clarity, Color, Odor, Ect.	
SEQ #	Time								clear, slightly turbid, turbid	
1	0752	7.54	8884	6.56	3.35	252.6	1.05	28.81	500	Clear
2	0757	7.70	8849	6.57	2.89	251.3	0.63	28.82	500	Clear
3	0802	7.61	8835	6.58	2.80	249.7	0.35	28.81	500	Clear
4	0807	7.52	8838	6.58	2.71	248.5	0.33	28.82	500	Clear
5										
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 2000 mL



Field Datasheet

Groundwater Assessment

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

Company: MDU Heskett
Event: 2016
Sample ID: MW70
Sampling Personal: Jerry Rhy

Weather Conditions: Temp: 45 °F Wind: S @ 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:		
Casing Diameter:	2"	
Water Level Before Purge:	<u>21.62</u>	ft
Total Well Depth:	<u>—</u>	ft
Well Volume:	<u>—</u>	liters
Depth to Top of Pump:	<u>—</u>	ft
Water Level After Sample:	<u>24.30</u>	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"/> No <input type="checkbox"/>	Recover: <u>56</u> sec.
Duplicate Sample?:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	PSI: <u>25</u>
Duplicate Sample ID:	<u>—</u>	Pumping Rate: <u>100</u> mL/min
Purge Date:	<u>12 Oct 16</u>	Time Purging Began: <u>1322</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>12 Oct 16</u>	Time of Sampling: <u>1347</u> am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric	

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	<u>1327</u>	<u>8.52</u>	<u>3942</u>	<u>7.02</u>	<u>2.55</u>	<u>43.7</u>	<u>3.86</u>	<u>22.09</u>	<u>500</u>	<u>Clear</u>
2	<u>1332</u>	<u>8.30</u>	<u>3940</u>	<u>7.02</u>	<u>2.37</u>	<u>48.9</u>	<u>2.27</u>	<u>22.15</u>	<u>500</u>	<u>Clear</u>
3	<u>1337</u>	<u>8.33</u>	<u>3927</u>	<u>7.01</u>	<u>2.36</u>	<u>51.5</u>	<u>1.37</u>	<u>22.20</u>	<u>500</u>	<u>Clear</u>
4	<u>1342</u>	<u>8.26</u>	<u>3935</u>	<u>7.02</u>	<u>2.36</u>	<u>54.3</u>	<u>0.60</u>	<u>22.23</u>	<u>500</u>	<u>Clear</u>
5	<u>1347</u>	<u>8.32</u>	<u>3932</u>	<u>7.01</u>	<u>2.34</u>	<u>56.5</u>	<u>0.63</u>	<u>22.33</u>	<u>500</u>	<u>Clear</u>
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 2500 mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2016
Sample ID: MW 13
Sampling Personal: Jemphr

Weather Conditions: Temp: 30 °F Wind: N05-10 Precip: Sunny ~~Partly Cloudy~~ Cloudy

Well Information

Well Locked?	Yes	<input checked="" type="radio"/> No	
Well Labeled?	<input checked="" type="radio"/> Yes	No	
Casing Straight?	<input checked="" type="radio"/> Yes	No	
Grout Seal Intact?	<input checked="" type="radio"/> Yes	No	Not Visible
Repairs Necessary:			
Casing Diameter:	2"		
Water Level Before Purge:	30.52	ft	
Total Well Depth:	— ft		
Well Volume:	— liters		
Depth to Top of Pump:	— ft		
Water Level After Sample:	31.13	ft	
Measurement Method:	Electric Water Level Indicator		

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	7 sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	No	Recover:	56 sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	20
Duplicate Sample ID:	—		Pumping Rate:	100 mL/min
Purge Date:	13 Oct 16	Time Purging Began:	0753	am/pm
Well Purged Dry?:	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	— am/pm
Sample Date:	13 Oct 16	Time of Sampling:	0813	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
1	0758	6.90	10513	6.85	3.04	240.8	4.88	31.00	500	Clear
2	0803	7.03	10540	6.90	2.43	239.9	3.58	31.07	500	Clear
3	0806	7.35	10509	6.88	2.42	238.0	2.57	31.07	500	Clear
4	0813	7.39	10508	6.86	2.44	238.3	1.50	31.08	500	Clear
5										
6										
7										
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 2000 mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
 Event: 2016
 Sample ID: MWBR
 Sampling Personal: Jerry May

Weather Conditions: Temp: 40 °F Wind: S@9-10 Precip: Sunny / Partly Cloudy / Cloudy

Well Information

Well Locked?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Well Labeled?	<input checked="" type="checkbox"/> 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:	<u>2"</u>	
Water Level Before Purge:	<u>14.71</u>	ft
Total Well Depth:	— ft	
Well Volume:	— liters	
Depth to Top of Pump:	— ft	
Water Level After Sample:	<u>15.00</u>	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<u>2</u> sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Recover:	<u>56</u> sec.
Duplicate Sample?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	PSI:	<u>20</u>
Duplicate Sample ID:	<u>Dup 2</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>13 Oct 16</u>	Time Purging Began:	<u>0922</u>	<u>am/pm</u>
Well Purged Dry?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Time Purged Dry:	— am/pm	
Sample Date:	<u>13 Oct 16</u>	Time of Sampling:	<u>0952</u>	<u>am/pm</u>
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.
									clear, slightly turbid, turbid
1	<u>0927</u>	<u>9.33</u>	<u>5693</u>	<u>7.11</u>	<u>230.3</u>	<u>2.08</u>	<u>14.98</u>	<u>500</u>	<u>Clear</u>
2	<u>0932</u>	<u>9.35</u>	<u>5701</u>	<u>7.12</u>	<u>228.6</u>	<u>1.51</u>	<u>15.02</u>	<u>500</u>	<u>Clear</u>
3	<u>0937</u>	<u>9.44</u>	<u>5688</u>	<u>7.12</u>	<u>227.3</u>	<u>1.24</u>	<u>15.04</u>	<u>500</u>	<u>Clear</u>
4	<u>0942</u>	<u>9.43</u>	<u>5684</u>	<u>7.12</u>	<u>228.9</u>	<u>1.53</u>	<u>15.06</u>	<u>500</u>	<u>Clear</u>
5	<u>0947</u>	<u>9.35</u>	<u>5696</u>	<u>7.12</u>	<u>224.4</u>	<u>1.58</u>	<u>15.04</u>	<u>500</u>	<u>Clear</u>
6	<u>0952</u>	<u>9.38</u>	<u>5683</u>	<u>7.12</u>	<u>223.0</u>	<u>1.62</u>	<u>15.05</u>	<u>500</u>	<u>Clear</u>
7									
8									
9									
10									

Stabilized: Yes No
 Comments:

Total Volume Removed: 3000 mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2016
Sample ID: MW105
Sampling Personal: Jeremy

Weather Conditions: Temp: 40 °F Wind: S 5-10 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:	<u>2"</u>	
Water Level Before Purge:	<u>13.44</u>	ft
Total Well Depth:	—	
Well Volume:	—	
Depth to Top of Pump:	—	
Water Level After Sample:	<u>13.70</u>	ft
Measurement Method:	Electric Water Level Indicator	

Sampling Information

Purging Method:	Bladder		Control Settings	
Sampling Method:	Bladder		Purge:	<u>4</u> sec.
Dedicated Equip?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Recover:	<u>56</u> sec.
Duplicate Sample?:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	PSI:	<u>15</u>
Duplicate Sample ID:	—		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>13 Oct 16</u>	Time Purging Began:	<u>1122</u>	am/pm
Well Purged Dry?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Time Purged Dry:	—
Sample Date:	<u>13 Oct 16</u>	Time of Sampling:	<u>1157</u>	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	<u>1127</u>	<u>9.06</u>	<u>6314</u>	<u>6.80</u>	<u>3.13</u>	<u>231.7</u>	<u>7.69</u>	<u>13.74</u>	<u>500</u>	<u>Clear</u>
2	<u>1132</u>	<u>8.91</u>	<u>6287</u>	<u>6.80</u>	<u>1.64</u>	<u>228.4</u>	<u>4.14</u>	<u>13.76</u>	<u>500</u>	<u>Clear</u>
3	<u>1137</u>	<u>8.83</u>	<u>6465</u>	<u>6.80</u>	<u>1.49</u>	<u>225.3</u>	<u>3.11</u>	<u>13.76</u>	<u>500</u>	<u>Clear</u>
4	<u>1142</u>	<u>8.87</u>	<u>6768</u>	<u>6.79</u>	<u>1.45</u>	<u>222.9</u>	<u>2.94</u>	<u>13.76</u>	<u>500</u>	<u>Clear</u>
5	<u>1147</u>	<u>8.87</u>	<u>6935</u>	<u>6.78</u>	<u>1.46</u>	<u>221.3</u>	<u>3.61</u>	<u>13.77</u>	<u>500</u>	<u>Clear</u>
6	<u>1152</u>	<u>8.84</u>	<u>7091</u>	<u>6.77</u>	<u>1.45</u>	<u>219.5</u>	<u>3.92</u>	<u>13.79</u>	<u>500</u>	<u>Clear</u>
7	<u>1157</u>	<u>8.85</u>	<u>7202</u>	<u>6.77</u>	<u>1.45</u>	<u>218.0</u>	<u>3.83</u>	<u>13.80</u>	<u>500</u>	<u>Clear</u>
8										
9										
10										

Stabilized: Yes No
Comments:

Total Volume Removed: 3500 mL

MVTL Calibration Worksheet

Site: MDU Heskett

Technician: Jeremy Pley

Instrument
(Circle One):

#1 650 MDS 08F100203

#2 650 MDS 04H14736

#3 556 MPS 12E102056

Pre Site Calibration						
Date:	12 Oct 16		Time: 0640			
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	19.15	7.03	7.00	6.95-7.05	-29.5	0 +/- 50
Buffer 10	19.19	10.07	10.00	9.95-10.05	-205.9	-180 +/- 50
Conductivity						Check
Buffer 10000	7.64	10414	10000	±10%	Buffer 5000	4995
ORP						
231 mV @ 25C	18.67	226.4	237.5	±10 mV		
DO					Barometric Pressure (mm Hg)	
	15.70	144.4%	101.5%	mg/L	771.08	

Post Site Check		
Time:		1706
pH	Temp °C	Reading
Buffer 7	19.02	7.02
Conductivity		
Buffer 5000	16.11	4998

Pre Site Calibration						
Date:	13 Oct 16		Time: 0700			
pH	Temp °C	Pre Cal	Post Cal	Post Cal Range	mv	mv Range +/- 50
Buffer 7	20.07	6.99	7.00	6.95-7.05	-28.8	0 +/- 50
Buffer 10	19.83	10.00	10.00	9.95-10.05	-205.7	-180 +/- 50
Conductivity						Check
Buffer 10000	20.54	9751	9999	±10%	Buffer 5000	4989
ORP						
231 mV @ 25C	20.51	232.9	237.5	±10 mV		
DO					Barometric Pressure (mm Hg)	
	27.93	92.4%	99.8%	mg/L	758.17	

Post Site Check		
Time:		1330
pH	Temp °C	Reading
Buffer 7	19.96	7.01
Conductivity		
Buffer 5000	19.87	5002



Field Datasheet

Groundwater Assessment

2616 E. Broadway Ave, Bismarck, ND

Phone: (701) 258-9720

Company: MDU Heskett
 Event: 2016
 Sample ID: HW-33
 Sampling Personal: Parren Nieswanger

Weather Conditions: Temp: 23 °F Wind: Light 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:	<u>42.32</u>		ft
Total Well Depth:	—		
Well Volume:	—		
Depth to Top of Pump:	<u>44.53</u>		ft
Water Level After Sample:	<u>42.84</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?:	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> No	Recover:	<u>55</u> sec.
Duplicate Sample?:	Yes	<input checked="" type="radio"/> No	PSI:	<u>-25</u>
Duplicate Sample ID:	—		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>13 Oct 16</u>	Time Purging Began:	<u>0805</u>	am/pm
Well Purged Dry?	Yes	<input checked="" type="radio"/> No	Time Purged Dry:	0832 am/pm
Sample Date:	<u>13 Oct 16</u>	Time of Sampling:	<u>0845</u>	am/pm
Bottle List:	CCR: 1L Raw, 500mL Nitric, 500mL Nitric (filtered), 4-1L Nitric			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription: Clarity, Color, Odor, Ect.	
										SEQ #
									clear, slightly turbid, turbid	
1	<u>0810</u>	<u>7.05</u>	<u>5586</u>	<u>6.56</u>	<u>3.81</u>	<u>3.2</u>	<u>6.20</u>	<u>42.90</u>	<u>500</u>	<u>cl</u>
2	<u>0815</u>	<u>6.79</u>	<u>5487</u>	<u>6.53</u>	<u>3.05</u>	<u>27.6</u>	<u>7.93</u>	<u>42.82</u>	<u>500</u>	<u>cl</u>
3	<u>0825</u>	<u>6.55</u>	<u>5454</u>	<u>6.52</u>	<u>3.18</u>	<u>45.3</u>	<u>4.84</u>	<u>42.82</u>	<u>1000</u>	<u>cl</u>
4	<u>0830</u>	<u>6.67</u>	<u>5446</u>	<u>6.51</u>	<u>3.06</u>	<u>46.1</u>	<u>3.30</u>	<u>42.82</u>	<u>500</u>	<u>cl</u>
5	<u>0835</u>	<u>6.80</u>	<u>5427</u>	<u>6.50</u>	<u>2.80</u>	<u>47.0</u>	<u>1.53</u>	<u>42.82</u>	<u>500</u>	<u>cl</u>
6	<u>0840</u>	<u>6.96</u>	<u>5412</u>	<u>6.50</u>	<u>2.92</u>	<u>47.9</u>	<u>1.52</u>	<u>42.82</u>	<u>500</u>	<u>cl</u>
7	<u>0845</u>	<u>7.32</u>	<u>5399</u>	<u>6.50</u>	<u>2.98</u>	<u>48.0</u>	<u>1.41</u>	<u>42.82</u>	<u>500</u>	<u>cl</u>
8										
9										
10										

Stabilized: Yes No
 Comments: (circled)

Total Volume Removed: 4000 mL



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

Field Datasheet

Groundwater Assessment

Company: MDU Heskett
Event: 2016
Sample ID: MW 2-90
Sampling Personal: Darren Nieswazy

Weather Conditions: Temp: 40 °F Wind: Light 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	<u>Not Visible</u>
Repairs Necessary:	<u>—</u>		
Casing Diameter:	<u>2"</u>		
Water Level Before Purge:	<u>21.72</u>	ft	
Total Well Depth:	<u>—</u>	ft	
Well Volume:	<u>—</u>	liters	
Depth to Top of Pump:	<u>22.30</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>55</u> sec.
Dedicated Equip?:	<input checked="" type="radio"/> Yes	<input type="radio"/> No	Recover:	<u>5</u> sec.
Duplicate Sample?:	<input checked="" type="radio"/> Yes	<input type="radio"/> No	PSI:	<u>—</u>
Duplicate Sample ID:	<u>—</u>		Pumping Rate:	<u>100</u> mL/min
Purge Date:	<u>13 Oct 16</u>	Time Purging Began:	<u>1119</u>	<u>am/pm</u>
Well Purged Dry?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	Time Purged Dry:	<u>—</u> am/pm
Sample Date:	<u>13 Oct 16</u>	Time of Sampling:	<u>1149</u>	<u>am/pm</u>
Bottle List:	<u>CCR: 1L Raw, 500mL Nitirc, 500mL Nitric (filtered), 4-1L Nitric</u>			

Field Measurements

Stabilization (3 consecutive)	Temp (°C)	Spec. Cond. ±5%	pH ±0.1	DO (mg/L) ±10%	ORP (mV) ±20 mV	Turbidity (NTU) ±10%	Water Level (ft) 0.25 ft	mL Removed	Discription:	
									Clarity, Color, Odor, Ect. clear, slightly turbid, turbid	
1	<u>1124</u>	<u>8.71</u>	<u>7677</u>	<u>6.93</u>	<u>5.40</u>	<u>57.1</u>	<u>0.76</u>	<u>21.92</u>	<u>500</u>	<u>clear</u>
2	<u>1129</u>	<u>8.30</u>	<u>7680</u>	<u>6.87</u>	<u>56.88</u>	<u>61.0</u>	<u>0.47</u>	<u>21.93</u>	<u>500</u>	<u>clear</u>
3	<u>1134</u>	<u>8.28</u>	<u>7649</u>	<u>6.88</u>	<u>4.28</u>	<u>62.0</u>	<u>0.52</u>	<u>22.10</u>	<u>500</u>	<u>clear</u>
4	<u>1139</u>	<u>8.09</u>	<u>7639</u>	<u>6.87</u>	<u>3.75</u>	<u>63.2</u>	<u>0.29</u>	<u>22.04</u>	<u>500</u>	<u>clear</u>
5	<u>1144</u>	<u>8.07</u>	<u>7623</u>	<u>6.87</u>	<u>3.63</u>	<u>63.7</u>	<u>0.30</u>	<u>22.00</u>	<u>500</u>	<u>clear</u>
6	<u>1149</u>	<u>8.29</u>	<u>7601</u>	<u>6.87</u>	<u>3.52</u>	<u>63.9</u>	<u>0.24</u>	<u>22.04</u>	<u>500</u>	<u>clear</u>
7										
8										
9										
10										

Stabilized: Yes No
Comments: (circled)

Total Volume Removed: 3000 mL