

2022 Annual Groundwater Monitoring and Corrective Action Report

CCR Landfill

R.M. Heskett Station Mandan, North Dakota

Prepared for Montana-Dakota Utilities Co.

January 2023

2022 Annual Groundwater Monitoring and Corrective Action Report

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January 2023

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Acronyms

Acronym	Description
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
MDU	Montana Dakota Utilities Co.
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
SSI	Statistically Significant Increase
TDF	Tire-Derived Fuel
TDS	Total Dissolved Solids

Executive Summary

This 2022 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the CCR landfill at MDU's R.M. Heskett Station (Site). The permitted landfill is the only CCR Unit at this Site.

At the beginning, end, and throughout 2022, the CCR Unit was operating under a detection monitoring program as described in 40 CFR 257.94 and NDAC 33.1-20-08-06-04. Pursuant to §257.94 and NDAC 33.1-20-08-06-04, statistically significant increases (SSIs) were determined for:

- August 2021: fluoride at MW2-90, chloride at MW-105, sulfate at MW-104, and total dissolved solids at MW-104
- May 2022: calcium at MW2-90 and MW3-90, chloride at MW-80R, and fluoride and total dissolved solids at MW1-90

Evaluation of the fall 2022 data is ongoing as required by the CCR Rules. Subsequent determinations and actions (if any) will be addressed in the 2023 Annual Report. Successful alternative source demonstrations (ASDs) were completed for the August 2021 and May 2022 SSIs. The ASD documentation is included in this report under Appendix B. Statistical evaluation of the August 2022 detection monitoring data is underway, and results are anticipated in 2023. Therefore, no assessment monitoring program (§257.95 and NDAC 33.1-20-08-06-04) or related corrective or remedial measures (§§257.96, 257.97, and 257.98; NDAC 33.1-20-08-06-06, -07, and -08) were necessary.

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operated R.M. Heskett Station (Site), a coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). Coal unit operations at the Site ended in March 2022, and the generating station is now undergoing decommissioning that is anticipated to be completed in 2023. One CCR (coal combustion residual) unit, as defined by 40 CFR 257.53 and North Dakota Administrative Code (NDAC) 33.1-20-08-01, is located on the property. The CCR unit contains coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning tire-derived fuel (TDF) at the facility. The CCR unit is required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261, Disposal of Coal Combustion Residuals from Electric Utilities) and the North Dakota Department of Environmental Quality (NDDEQ) CCR Rule (NDAC Title 33.1, Article 20, Chapter 8).

This 2022 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the CCR landfill at MDU's R.M. Heskett Station (Site).

1.1 Purpose

As stated in §257.90(e) and NDAC 33.1-20-08-06-01(e), the Annual Report must:

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

1.2 CCR Rule Requirements

Additional requirements for the Annual Report, as outlined in §257.90(e) and NDAC 33.1-20-08-06-01(e), and this Site's compliance with the CCR Rules, are summarized in Table 1.

Table 1 CCR Rule Requirements and Compliance

EPA CCR Rule Reference (40 CFR)	NDDEQ CCR Rule Reference (NDAC)	Content Required in Report	Location
§257.90(e)(1)	§33.1-20-08- 06-01(e)(1)	Monitoring System Figure: A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit.	Section 2.1 Groundwater Monitoring System; see Figure 1
§257.90(e)(2)		Monitoring System Adjustments: Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.	Section 2.1.1 Changes to Groundwater Monitoring System
§257.90(e)(3)	§33.1-20-08- 06-01(e)(3)	Data and Collection Summary : In addition to all the monitoring data obtained under §257.90 through §257.98 and §33.1-20-08-06, a summary including the number of groundwater samples that were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs.	Section 2.3 Data and Collection Summary; monitoring data included in Table 2, Appendix A, and Appendix C
§257.90(e)(4)	§33.1-20-08- 06-01(e)(4)	Monitoring Program : A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).	Not applicable – No transition between monitoring programs was necessary
§257.90(e)(5)	§33.1-20-08- 06-01(e)(5)	Other Information : Other information required, if applicable, to be included in the annual report as specified in §257.90 through §257.98 and §33.1-20-08-06.	Section 2.2 Actions Completed/Problems Encountered; Appendix B
§257.90(e)(6)	<u>n/a</u>	Executive Summary: A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.	Executive Summary

2.0 Groundwater Monitoring Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR unit in 2022. A description of the groundwater monitoring system is included in Section 2.1, key actions completed and problems encountered are described in Section 2.2, the monitoring and analytical results are described in Section 2.3, and key activities planned for 2023 are described in Section 2.4.

2.1 Groundwater Monitoring System

The certified groundwater monitoring well network around the CCR unit consists of one upgradient well (MW-13) and four downgradient wells (MW-80R, MW1-90, MW2-90, and MW3-90). Well locations are shown on Figure 1.

2.1.1 Changes to Groundwater Monitoring System

In 2021, MDU applied for a modification to Permit 0087 from NDDEQ. The permit application included an updated groundwater monitoring network for the CCR unit. The modified permit was issued on February 14, 2022. The system described in Section 2.1 and shown on Figure 1 supplanted the groundwater monitoring system described in the Groundwater Monitoring System Certification (Barr, 2017a).

2.2 Actions Completed/Problems Encountered

The following actions were completed in 2022:

- **Detection Monitoring Sampling:** Groundwater samples were collected from each well in the groundwater monitoring system on May 2-3, 2022, and from two of the five wells in the groundwater monitoring system on October 17, 2022. Downgradient monitoring wells MW1-90, MW2-90, and MW3-90 could not be sampled in October 2022 due to insufficient volume. Groundwater samples were analyzed for Appendix III constituents, per the detection monitoring program of the CCR Rules (§257.94 and NDAC 33.1-20-08-06-04).
- SSI Evaluation: SSI evaluations were conducted in accordance with the Groundwater Statistical Method Selection Certification (Statistical Certification; Barr, 2017b) for the May 2022 and October 2022 detection monitoring events, both of which resulted in potential SSIs.
- **Verification Retesting:** Verification resampling was conducted on August 8 and 11, 2022, and confirmed the potential SSIs identified in the May 2022 event SSI evaluation.
- Alternative Source Demonstration (ASD): ASDs were conducted on the verified SSIs for the August 2021 and May 2022 detection monitoring events. Both ASDs demonstrated an alternative source, as allowed by the CCR Rules (§257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2)). More details are provided in Section 2.3.

The following problems were encountered in 2022:

- **Damage to MW1-90:** MW1-90 was damaged in a motor vehicle accident between the May detection monitoring event and the August resampling event. The riser was bent in a way that prevented sampling.
- Dry Wells: During the October 2022 detection monitoring event, the water levels in monitoring
 wells MW1-90, MW2-90, and MW3-90 were below the installed pumps. The samplers concluded
 that there was an insufficient volume of water in the well for sampling. Therefore, no samples
 were collected from three of the five monitoring wells during the August 2022 detection
 monitoring event. These wells have historically undergone dry periods lasting for multiple
 sampling events.

The following steps were taken to resolve the problems encountered in 2022:

- Repair of damaged well: Repairs were made to the well casing. The well was redeveloped and sampled (Appendix A).
- Planning for new well(s): Water levels are being evaluated to determine a location for one or
 more wells to be constructed or reconstructed in the area where monitoring wells were dry in
 October 2022. If water levels do not recover to levels that will allow for representative samples to
 be collected, additional wells will be installed by the end of 2023 and described in the 2023
 annual report.

2.3 Data and Collection Summary

2.3.1 August 2021 Detection Monitoring Event

As mentioned in the 2021 Annual Report (Barr, 2022), an SSI evaluation was conducted on the results of the August 2021 detection monitoring event. Four potential SSIs (fluoride at MW2-90, chloride at MW-105, sulfate at MW-104, and TDS at MW-104) were identified.

An Appendix III ASD was conducted on the verified SSIs and was able to successfully demonstrate that a natural variation in groundwater quality resulted in the SSIs, as allowed by §257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2). The Alternative Source Demonstration: August 2021 Event Report is included in Appendix B.

2.3.2 May 2022 Detection Monitoring Event

Groundwater samples were collected from the five groundwater monitoring network wells at the Site on May 2-3, 2022. Five potential SSIs (calcium at MW2-90 and MW3-90, chloride at MW80R, and fluoride and total dissolved solids at MW1-90) were identified. Verification resampling was conducted on August 8 and 11, 2022, and confirmed the five potential SSIs. A summary of results is included in Table 2. Field data sheets and analytical laboratory reports for detection monitoring sampling and verification resampling are included in Appendix A. Water level contours are shown on Figure 2, and flow calculations are included in Appendix C.

An Appendix III ASD was conducted on the verified SSIs and was able to successfully demonstrate that a natural variation in groundwater quality and/or "a source other than the CCR unit" resulted in the SSIs, as allowed by §257.94(e)(2) and NDAC 33.1-20-08-06-04(e)(2). The Alternative Source Demonstration: May 2022 Event is included in Appendix B.

2.3.3 October 2022 Detection Monitoring Event

Groundwater samples were collected from two groundwater monitoring network wells at the Site on October 17, 2022. Downgradient monitoring wells MW1-90, MW2-90, and MW3-90 could not be sampled due to insufficient volume. A summary of results is included in Table 2. Field data sheets and analytical laboratory reports for detection monitoring sampling are included in Appendix A. Water level contours are shown on Figure 3, and flow calculations are included in Appendix C.

Statistical analysis of the results was ongoing at the end of 2022. If the analysis identifies any SSIs, appropriate actions will be initiated per the CCR Rules as applicable.

2.4 Activities for Upcoming Year

The following key activities for analytical results and statistical evaluations are planned for 2023:

- Complete SSI and, if necessary, ASD or assessment monitoring determination for the October 2022 detection monitoring event in accordance with the Statistical Certification (Barr, 2017b).
- Evaluate analytical results from 2023 semi-annual detection monitoring events for SSIs according to the Statistical Certification (Barr, 2017b).

3.0 Operational Activity

The following information summarizes operational activities at the CCR Landfill in 2022. A total of 891 tons of limestone along with 1,043 tons of sand were used in the Unit #2 fluidized bed. Below are the total tons hauled to Landfill Slot 10.

Slot ID	Fly Ash	Sand Ash	Coarse Ash	Total
Slot 10	5,792 tons	1,155 tons	363 tons	7,310 tons

3.1 Asbestos Disposal and Other Materials

No asbestos was disposed of in the Landfill in 2022.

The coal units came offline earlier than expected. With the unanticipated shut down there were 400 tons of unused TDF that did not go into Unit #1. This was placed in the ash slot and used for dust suppression. There was a total of 3,000 cubic yards of sludge and some timbers form the dredging of the Low Volume Waste Pond placed in the ash slot.

Heskett Station allows bottom ash to be hauled offsite if the outside entity has received a letter of approval from the NDDEQ. No ash was hauled off site.

3.2 Inspections and Maintenance

On occasion, small amounts of ash were spilled on the road during hauling. It was cleaned up the same day by sweeping into a shovel or bucket and then transported to the landfill. No major amounts of ash were spilled on the ash haul road. Ash slot dust control is achieved by the placement of Unit 2 bottom sand ash over the leveled fly ash. A water truck provides additional dust control.

If excessive winds occurred, ash hauling was either delayed until wind speeds dropped, ash was placed in the slot to eliminate dust at the facility boundaries, dust was suppressed by water truck, or a combination of these processes. The ash haul road remains in good condition.

Phase I and II leachate systems were each flushed with approximately 2,000 gallons of water in August 2022 and October 2022. The system was flushed from the standpipes to the Evaporation Pond. There were no obstructions of flow.

The Ash Landfill cover was inspected for erosion during 2022. No erosion was observed on the seeded areas, and vegetation is well established around Phases I and II. The covers of the ash disposal site are in good condition on all closed slots. The ash slot expansion area has good coverage. Hay was not farmed on the final cover area in 2022.

The banks of the Evaporation Pond were observed on each inspection and found to be in good condition with no erosion.

3.3 Leachate Sampling

No water samples were taken from the Evaporation Pond in 2022. There was no level of water for a sample to be taken. Typically, leachate samples are collected semi-annually from the leachate pipe, or from the pond if no flow is observed through the pipe.

4.0 References

- Barr Engineering Co. (Barr), 2017a. Groundwater Monitoring System Certification, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. October 2017.
- Barr, 2017b. Statistical Method Selection Certification, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. October 2017.
- Barr, 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report: CCR Landfill, R.M. Heskett Station. Prepared for Montana-Dakota Utilities Co. January 2022.

Tables

Table 2 Water Quality Analytical Data Summary 2022 Annual Monitoring Report Heskett CCR Groundwater Compliance

Location Date			MW 5/02/		MW 10/17		MW1-90 5/03/2022	MW1-90 8/11/2022	MW2-90 5/03/2022	MW2-90 8/08/2022	MW3-90 5/03/2022	MW3-90 8/08/2022	MW80R 5/02/2022	MW80R 8/08/2022	MW80R 10/17/2022
	Sam	ple Type	N	FD	N	FD	N	Resample	N	Resample	N	Resample	N	Resample	N
Parameter	Analysis Location	Units													
Appendix III															
Boron, total	Lab	mg/l	0.66	0.63	0.57	0.62	< 0.5 U	0.29	< 0.5 U		0.14		< 0.5 U		< 0.5 U
Calcium, total	Lab	mg/l	401	396	397	409	392	370	451	508	506	501	409		418
Chloride	Lab	mg/l	79.2	79.1	71.5	71.8	90.7	97.0	86.6		36.5		162	154	149
Fluoride	Lab	mg/l	0.76	0.77	0.84	0.84	1.12	1.14	1.01		0.11		0.21		0.23
pН	Field	pH units	6.94	6.94	7.03	-	6.85	6.78	6.94	7.00	6.91	6.92	6.93	7.00	7.05
Solids, total dissolved	Lab	mg/l	10600	10700	10600	10500	11600	12700	8670		4900		6140		6310
Sulfate, as SO4	Lab	mg/l	6190	6190	6890	6700	6490	7280	4830		2470		2910		3460

⁻⁻ Not analyzed/Not available.

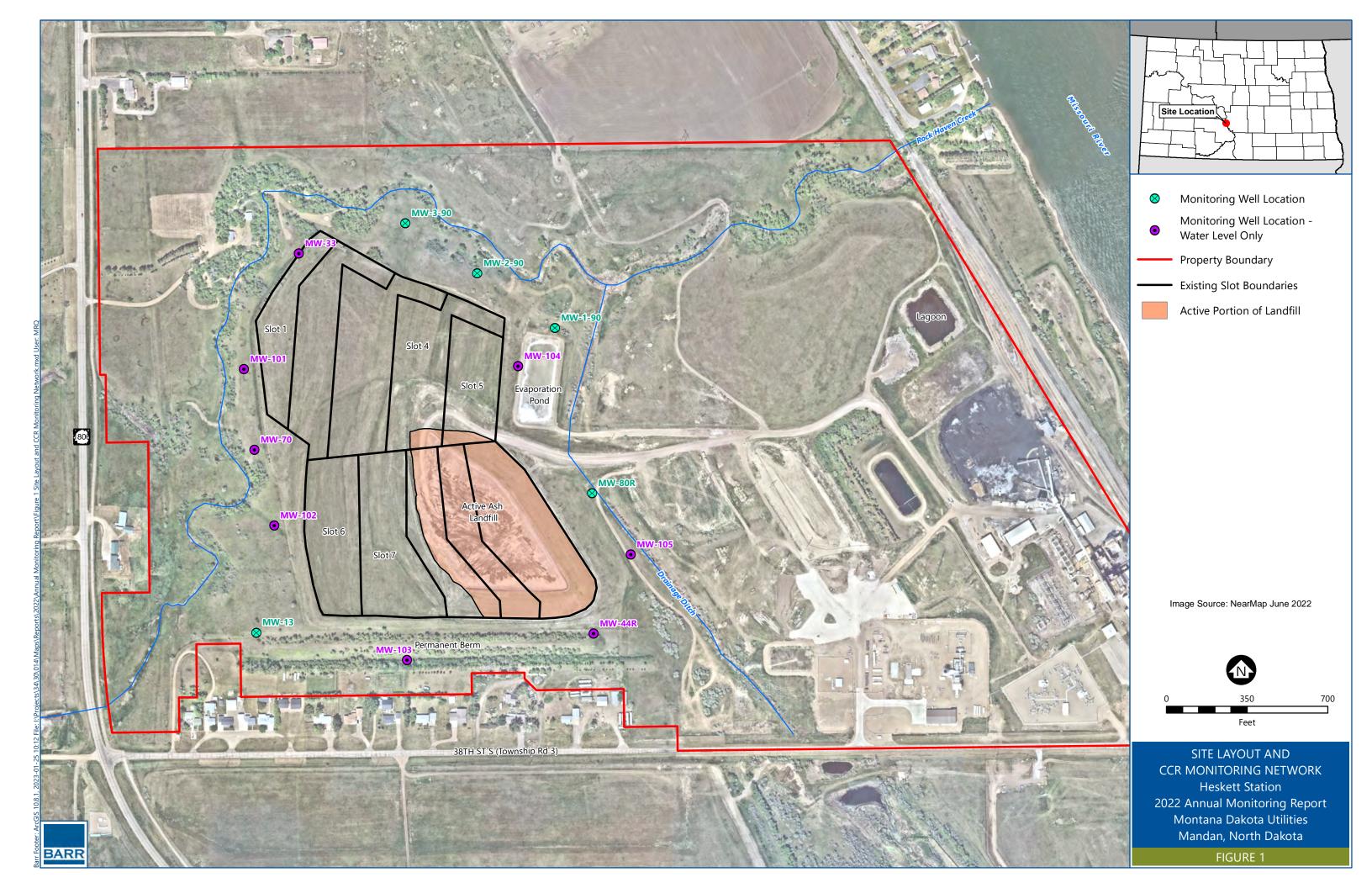
N Sample Type: Normal

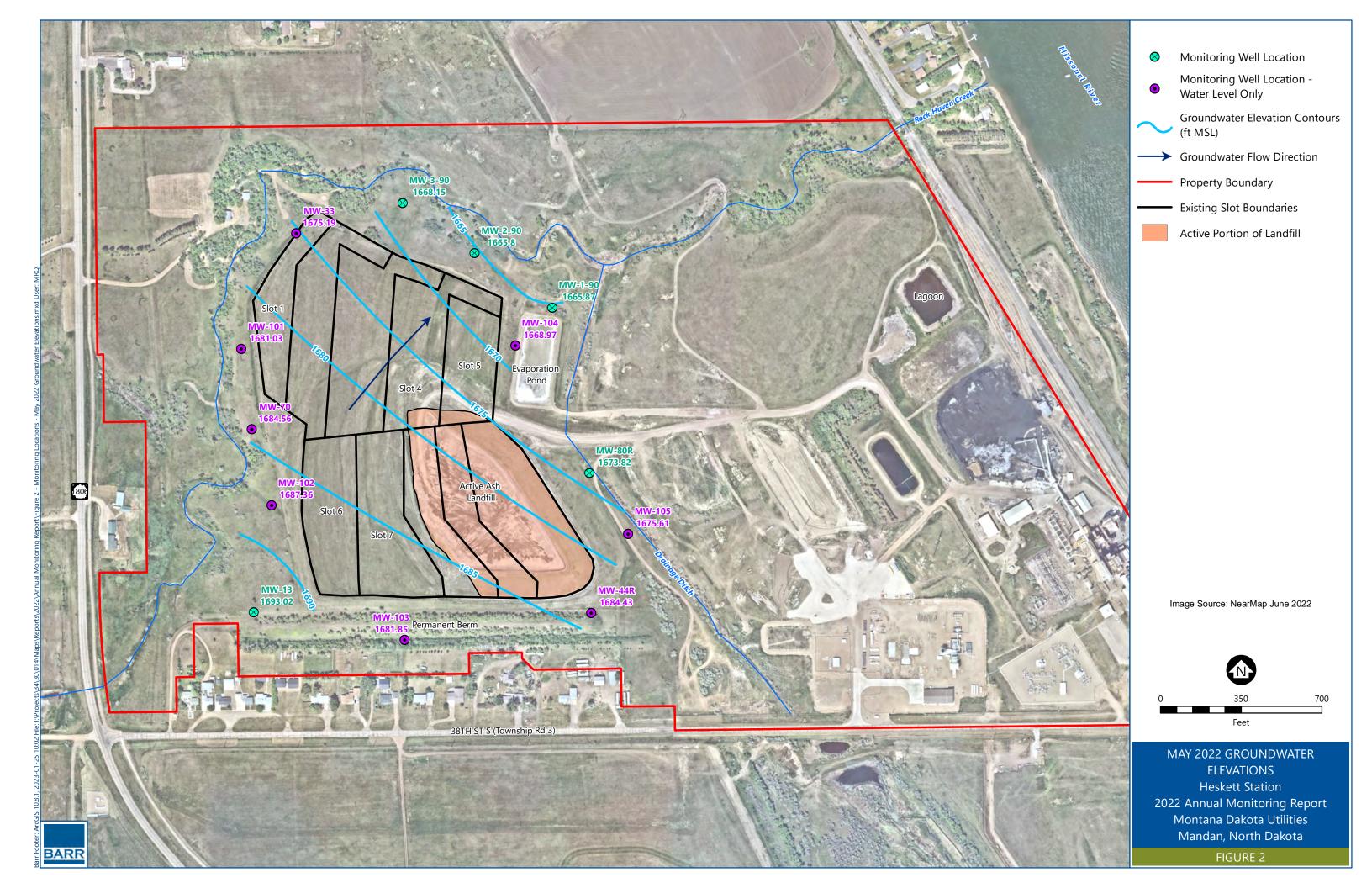
FD: Sample Type: Field Duplicate

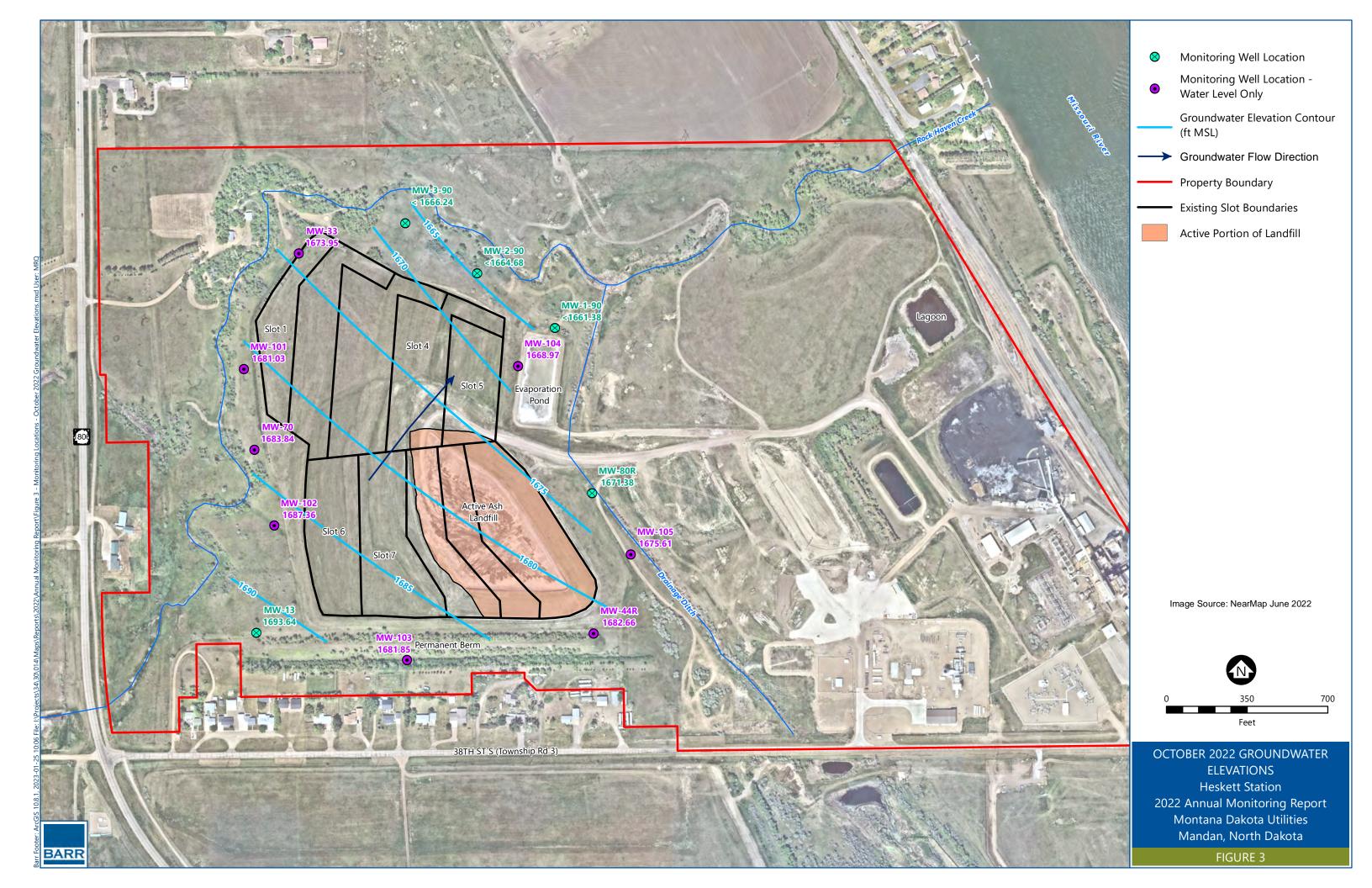
U: The analyte was analyzed for, but was

not detected.

Figures







Appendices

Appendix A

Laboratory Reports and Field Sheets

Laboratory Reports and Field Sheets: 2022 Laboratory Reports and Field Sheets: MW1-90 Laboratory Reports and Field Sheets: 2022



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Spring 2022 (908) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

908002 (MW1-90) - Paying sample

Total and dissolved selenium results have been rechecked.

Analysis Results Comments

908001 (MW13)

Sample analyzed beyond holding time.(pH)

908002 (MW1-90)

Sample analyzed beyond holding time.(pH)

908003 (MW2-90)

Sample analyzed beyond holding time.(pH)

908004 (MW3-90)

Sample analyzed beyond holding time.(pH)

908005 (MW80R)

Sample analyzed beyond holding time.(pH)

908006 (Dup 1)

Sample analyzed beyond holding time.(pH)

908007 (Field Blank)

Sample analyzed beyond holding time.(pH)





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	9688	umhos/cm	1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.94	units	0.01	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	7.47	degrees C		1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: ASTM D516-11									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6190	mg/L	250	50	05/05/2022 12:31	05/05/2022 12:31	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.66	mg/L	0.5	5	05/05/2022 08:13	05/11/2022 13:18	SLZ	MA,NDA	
Calcium	401	mg/L	5	5	05/05/2022 08:13	05/10/2022 09:56	MDE	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.3	units	0.1	1	05/04/2022 13:39	05/04/2022 13:39	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
	D 14 -	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter	Results				05/09/2022	05/09/2022			
Parameter Chloride	79.2	mg/L	2	1	09:08	09:08	SRD	MA,NDA	
			2	1			SRD	MA,NDA	
Chloride			2 RDL	1 DF			SRD	MA,NDA Cert	Qual

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Report Date: Wednesday, June 29, 2022 10:06:58 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	10600	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908002
 Date Collected:
 05/03/2022 13:45
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units RDL	. DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	7558	umhos/cm 1	1	05/03/2022 13:45	05/03/2022 13:45	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.85	units	0.01	1	05/03/2022 13:45	05/03/2022 13:45	JSM		

Method: 170.1

Parameter	Results	Units F	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.77	degrees C		1	05/03/2022 13:45	05/03/2022 13:45	JSM		

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6490	mg/L	250	50	05/05/2022 12:32	05/05/2022 12:32	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.5	mg/L	0.5	5	05/05/2022 08:13	05/11/2022 13:23	SLZ	MA,NDA	
Calcium	392	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:02	MDE	MA,NDA	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH	7.4	units	0.1	1	05/04/2022	05/04/2022	RAA	MA,NDA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	90.7	mg/L	2	1	05/09/2022 09:09	05/09/2022 09:09	SRD	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.12	mg/L	0.1	1	05/04/2022 14:15	05/04/2022 14:15	RAA		

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Report Date: Wednesday, June 29, 2022 10:06:58 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908002
 Date Collected:
 05/03/2022 13:45
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	11600	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	7294	umhos/cn	n 1	1	05/03/2022	05/03/2022 11:50	JSM		

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.94	units	0.01	1	05/03/2022 11:50	05/03/2022 11:50	JSM		_

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	7.84	degrees C		1	05/03/2022 11:50	05/03/2022 11:50	JSM		

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	4830	mg/L	100	20	05/05/2022 12:19	05/05/2022 12:19	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.5	mg/L	0.5	5	05/05/2022	05/11/2022	SLZ	MA.NDA	
Богоп	~ 0.5	IIIg/L	0.5	J	08:13	13:25	SLZ	IVIA, NDA	
Calcium	451	mg/L	5	5	05/05/2022	05/10/2022	MDE	MA.NDA	
Calolatti	401	mg/L	Ü	O	08:13	10:04	IVIDE	1017 (,1107 (

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Anaiyzed	Ву	Cert	Quai
рН	7.4	units	0.1	1	05/04/2022 14:44	05/04/2022 14:44	RAA	MA,NDA	*

11...14...

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	86.6	mg/L	2	1	05/09/2022 09:10	05/09/2022 09:10	SRD	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.01	mg/L	0.1	1	05/04/2022 14:44	05/04/2022 14:44	RAA		

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Report Date: Wednesday, June 29, 2022 10:06:58 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	8670	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908004
 Date Collected:
 05/03/2022 09:18
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units RD	_ DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4775	umhos/cm 1	1	05/03/2022 09·18	05/03/2022 09·18	JSM		

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.91	units	0.01	1	05/03/2022 09:18	05/03/2022 09:18	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.03	degrees C		1	05/03/2022 09:18	05/03/2022 09:18	JSM		

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	2470	mg/L	100	20	05/05/2022 12:20	05/05/2022 12:20	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.14	mg/L	0.1	1	05/05/2022 08:13	05/11/2022 13:27	SLZ	MA,NDA	
Calcium	506	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:06	MDE	MA,NDA	

Method: SM4500 H+ B-2011

Parameter	Results	Units	KDL	DF	Prepared	Anaiyzed	ву	Cert	Quai
pH	7.3	units	0.1	1	05/04/2022 15:49	05/04/2022 15:49	RAA	MA,NDA	*

11...14...

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	36.5	mg/L	2	1	05/09/2022 09:11	05/09/2022 09:11	SRD	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.11	mg/L	0.1	1	05/04/2022 15:49	05/04/2022 15:49	RAA		

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Report Date: Wednesday, June 29, 2022 10:06:58 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908004
 Date Collected:
 05/03/2022 09:18
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	4900	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908005
 Date Collected:
 05/02/2022 12:57
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4784	umhos/cm	1	1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.93	units	0.01	1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	8.3	degrees C		1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: ASTM D516-11									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	2910	mg/L	100	20	05/05/2022 12:21	05/05/2022 12:21	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.5	mg/L	0.5	5	05/05/2022 08:13	05/11/2022 13:29	SLZ	MA,NDA	
Calcium	409	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:08	MDE	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.5	units	0.1	1	05/04/2022 15:32	05/04/2022 15:32	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Method: SM4500-CI-E 2011 Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
	Results 162	Units mg/L	RDL 2	DF 1	05/09/2022 09:13	Analyzed 05/09/2022 09:13	By SRD	MA,NDA	Qual
Parameter					05/09/2022	05/09/2022			Qual
Parameter Chloride					05/09/2022	05/09/2022			Qual

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Report Date: Wednesday, June 29, 2022 10:06:58 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908005
 Date Collected:
 05/02/2022 12:57
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	6140	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908006
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	9688	umhos/cm	1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.94	units	0.01	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	7.47	degrees C		1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Method: ASTM D516-11									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6190	mg/L	250	50	05/05/2022 12:34	05/05/2022 12:34	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.63	mg/L	0.5	5	05/05/2022 08:13	05/11/2022 13:31	SLZ	MA,NDA	
Calcium	396	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:10	MDE	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.3	units	0.1	1	05/04/2022 16:06	05/04/2022 16:06	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
		Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter	Results	Omis			05/00/0000				
	Results 79.1	mg/L	2	1	05/09/2022 09:14	05/09/2022 09:14	SRD	MA,NDA	
Parameter			2	1			SRD	MA,NDA	
Parameter Chloride			2 RDL	1 DF			SRD	MA,NDA	Qual

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Report Date: Wednesday, June 29, 2022 10:06:58 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908006
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	10700	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:908007Date Collected:05/03/2022 12:50Matrix:GroundwaterSample ID:Field BlankDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	<5	mg/L	5	1	05/05/2022 12:23	05/05/2022 12:23	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.1	mg/L	0.1	1	05/05/2022 08:13	05/11/2022 13:32	SLZ	MA,NDA	
Calcium	<1	mg/L	1	1	05/05/2022 08:13	05/10/2022 10:12	MDE	MA,NDA	

Method: SM4500 H+ B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.0	units	0.1	1	05/04/2022 13:13	05/04/2022 13:13	RAA	MA,NDA	*

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	<2	mg/L	2	1	05/09/2022 09:23	05/09/2022 09:23	SRD	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	<0.1	mg/L	0.1	1	05/04/2022 13:13	05/04/2022 13:13	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	<10	mg/L	10	1	05/05/2022 10:00	05/05/2022 10:00	AMC	MA,NDA	

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Report Date: Wednesday, June 29, 2022 10:06:58 AM



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Account #:

2800

Client: Montana-Dakota Utilities - Bismarck



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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www.mvtl.com

May 6, 2022

Montana-Dakota Utilities **Todd Peterson** 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From May 2-3, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 5 wells. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

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

Wednesday, June 29, 2022 10:06:58 AM Report Date:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	Minneso 2616 E. Br Bismarck, (701) 258-1	aborate	orie	es				ans-Dakot D: 908	a Utilities –	Bis	Chain of Custody Record			
Report To:	MDU			CC:							Project Na	ame:		ADU Heskett
Attn: Address:	Todd Peterson 400 N. 4th St Bismarck, ND 58501									Event:			Spring 2022	
Phone: Email:	701-425-2427 Todd.Peterson@mdu.c	om									Sampled I		cremy	Mayer
	Sam	ple Information	n				Sar	nple Cor	tainers		Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL HNO3 (filtered)	250 mL H2SO4		Temp (°C)	Spec. Cond.	.Hd	Turbidity (NTU)	Analysis Required
001	MW13	2 May 22	0900	GW	X	X	X	X		7.47	9688	6.94	3.00	
002	MW1-90	3 May 22	1345	GW	X	X	Х	x		6.77	7558	6,85	0.12	
003	MW2-90	3 May 22	1150	GW	X	X	X	x		7.84	7294	6.94	0.20	
004	MW3-90	3 Marzz	0918	GW	X	X	х	x		6.03	4775	6.91	0.64	MDU Heskett List
005	MW80R	2 May 22	1257	GW	X	X	х	X		8.30	4784	6.93	0.24	wido neskett list
006	Dup 1	ZMay 22	0900	GW	X	X	X	X		7.47	9688	6.94	3.00	
	Field Blank (FB)	3 Man 22	1250	GW	X	X	x	x		NA	NA.	NA	NA	

Sample Condition

Temp (°C)

TM562 / TM805

Location

Log In Walk In #2

Date/Time

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Received By

Name

Date/Time

4Mays

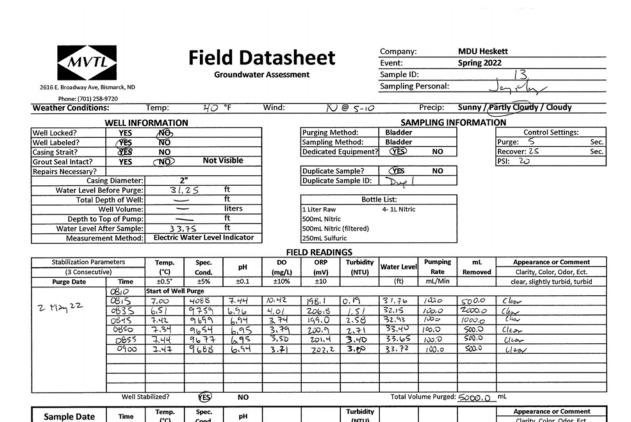
Relinquished By



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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



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(NTU)

3,00

Clarity, Color, Odor, Ect.

(°C)

7,47

900

2 Mmzz

Comments:

Cond

9688

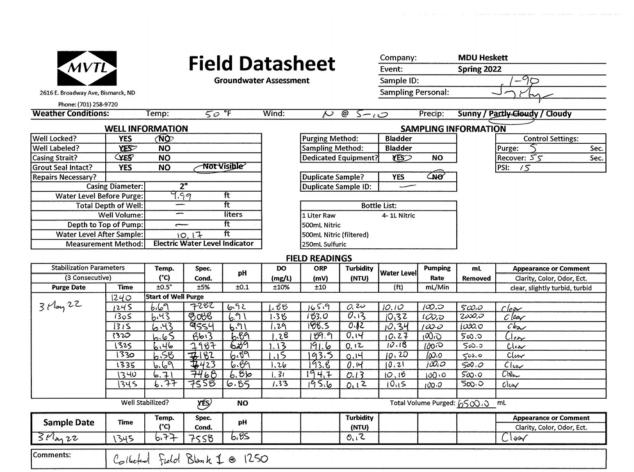


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2022

 Sample ID:
 2-90

 Sampling Personal:
 June 100

Sunny / Partly Cloudy / Cloudy

Purge:

Control Settings:

Sec.

Weather Conditions: Temp: WELL INFORMATION Well Locked? YES 440 Well Labeled? NO Casing Strait? YES NO Not Visible Grout Seal Intact? YES NO Repairs Necessary? Casing Diameter: Water Level Before Purge: Total Depth of Well: Well Volume liters Depth to Top of Pump: ft Water Level After Sample: Measurement Method: Electric Water Le vel Indicator

SAMPLING INFORMATION
Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? (YES) NO

Precip:

Duplicate Sample? YES NO
Duplicate Sample ID:

Bottle List:

1 Liter Raw 4- 1L Nitric

SOOML Nitric

SOOML Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization Para	ameters	Temp.	Spec.	pH	1 00	OKP	Turbiaity	Water Level	Pumping	m L	Appearance or Comment
(3 Consecuti	ive)	(°C)	Cond.	PΠ	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	(050	Start of Wel	l Purge								
3 My 22	1055	7.31	7500	7.01	5.00	210.1	0.86	21.61	10.0	500.0	Class
7	1115	7.77	7020	6,95	3.65	202.3	0,15	21.67	120.0	2000.0	Clear
	1125	7.72	6654	6.96	3.95	182.0	0.29	21.90	100.0	1000.0	Clear
1	1130	7.68	6516	6.96	4.01	176.0	0.16	21,91	100.0	50.0	Clear
	1135	7.69	6338	6.96	3,75	1707	0,13	21.92	1000	500.0	Clear
	1140	7.79	6987	6,95	3.98	170.3	0.15	21,93	180.0	500.0	Clear
	1145	7.B1	7118	6.94	4.01	170.6	0,17	21.94	100:00	5000	Clear
1	1150	7.84	7294	6.94	4.12	170.9	0,20	21.94	100.0	500,0	Cla
										L .	
	Well St	abilized?	(YES)	NO				Total Vol	ume Purged:	500.0	mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	pН		bidity ITU)		Appearance or Comment Clarity, Color, Odor, Ect.
3 May 22	1150	7.84	7294	6,94	0	20		Clar

Comments:

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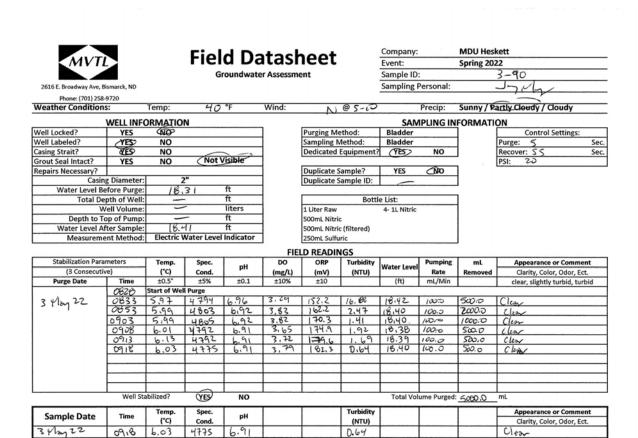
Report Date: Wednesday, June 29, 2022 10:06:58 AM



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



Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



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0.64

Wednesday, June 29, 2022 10:06:58 AM Report Date:

6.03

Comments



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

Company: MDU Heskett

Event: Spring 2022

Sample ID: COR

Sampling Personal:

Sunny Partly Cloudy / Cloudy

Purge:

PSI: i≤

Recover: 25

Control Settings:

Weather Conditions: Wind: Temp: WELL INFORMATION NO Well Locked? YES Well Labeled? NO Casing Strait? (YES NO Not Visible Grout Seal Intact? YES NO Repairs Necessary? Casing Diameter: Water Level Before Purge: Total Depth of Well: Well Volume liters Depth to Top of Pump: ft Water Level After Sample: **Electric Water Level Indicator** Measurement Method:

SAMPLING INFORMATION
Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? (YES) NO
PSI

Precip:

N@ 5-10

Duplicate Sample? YES NO
Duplicate Sample ID:

Bottle List:

1 Liter Raw
4- 1L Nitric

500mL Nitric

500mL Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization Para	meters	Temp.	spec.	pH	ן טט	OKP	Turbiaity	Water Level	Pumping	l mr	Appearance or Comment
(3 Consecutiv	ve)	(°C)	Cond.	, pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	1157	Start of Wel	l Purge								
2 May 22	1202	7.34	5364	6.96	0.97	207.2	0,30	13, 13	9000	50.0	Clean
2 1 00	1232	6,30	4977	6.95	1.21	202.7	0.29	13.21	100,0	2000,0	Clear
1	1242	8,27	4918	6.94	1.1/	201.9	0,19	13,24	100.0	1000,0	Clear
1	1247	B.24	4678	6,93	i.06	200.3	0.26	13.32	100.0	500	Clear
	1252	8.21	4621	6.93	0.95	198.6	0.27	13.33	100.0	500.0	Clear
1	1257	8.30	4784	6.93	0.89	198,1	0.24	13,34	100.0	500.0	clear
1											
	Well St	abilized?	(FES)	NO				Total Vol	ume Purged:	50020	mL

			_				
Sample Date	Time	Temp.	Spec.	pH	Turbidity		Appearance or Comment
Sample Date	Time	(°C)	Cond.	pri	(NTU)		Clarity, Color, Odor, Ect.
2 May 22	1257	8.30	4784	6.93	0,24		Char

Comments:

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL	
2616 E. Broadway Ave, Bismar	ck, N

Field Datasheet

Surface water Assessment

Company: MDU Lewis & Clark
Event: Spring 2022

Sampling Personal:

Weather Conditions	: Temp:	45	°F	Wind:	N	@ 5-10	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID-	Date	Time	Casing Diameter	Water Level (ft)			Coi	mments
MW70		1130	2"	21.78				
MW33		1150	2"	42.76				
MW101		1132	2"	37.94				
MW102	2 May 22	1128	2"	19.50				
MW103		1140	2"	36,74				
MW44R		1137	2"	27.14				
MW104		1147	2"	14.18				
MW105		1154	2"	11.78				

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Original SampleQC Type	Analyte	Analysis Date	QC Result	Original Sa	mple Re Units	Spike AmorS	pike Resu Sp	ike % Recov⊦Spik	e Duplicate Spike	e Duplicate RF	PD (%) L	ower Control Limi Uppe	r Control Limi RPD	Limit (%)
908001 PDS	Boron	05/11/2022 13:19:00	86.3	0.66	mg/L	2	2.385	86.3				75	125	
908001 PDSD	Boron	05/11/2022 13:21:00	90.4	0.66	mg/L				2.466	90.4	3.34	75	125	20
LFB-OE	Boron	05/11/2022 13:16:13	99		mg/L	0.4	0.3959	99				85	115	
MB	Boron	05/11/2022 13:14:17	<0.1		mg/L									
905001 DUP	Calcium	05/10/2022 09:54:21	131.5		mg/L						3.8			20
908001 PDS	Calcium	05/10/2022 09:58:00	94.4	401	mg/L	400	778.7	94.4				75	125	
908001 PDSD	Calcium	05/10/2022 10:00:00	94.6	401	mg/L				779.2	94.6	0.0642	75	125	20
926001 DUP	Calcium	05/10/2022 10:33:07	351.8	354	mg/L						0.623			20
926002 PDS	Calcium	05/10/2022 10:37:00	96.1	447	mg/L	400	831.4	96.1				75	125	
926002 PDSD	Calcium	05/10/2022 10:39:00	94.1	447	mg/L				823.4	94.1	0.967	75	125	20
927004 PDS	Calcium	05/10/2022 11:02:00	101	716	mg/L	400	1012	101				75	125	
927004 PDSD	Calcium	05/10/2022 11:04:00	99.7	716	mg/L				1006	99.7	0.595	75	125	20
LFB-MI	Calcium	05/10/2022 10:24:55	106		mg/L	100	105.5	106				85	115	
LFB-MI	Calcium	05/10/2022 09:50:19	107		mg/L	100	107.3	107				85	115	
MB	Calcium	05/10/2022 09:47:00	<1		mg/L									
MB	Calcium	05/10/2022 10:22:17	<1		mg/L									
908004 MS	Chloride	05/09/2022 09:16:17	112	36.5	mg/L	30	70.2	112				80	120	
908004 MSD	Chloride	05/09/2022 09:17:28	109	36.5	mg/L				69.3	109	1.29	80	120	20
LFB	Chloride	05/09/2022 10:22:07	92.5		mg/L	30	27.7	92.5		92.5		90	110	
LFB	Chloride	05/09/2022 09:19:49	92.8		mg/L	30	27.8	92.8				90	110	
LFB	Chloride	05/09/2022 08:55:56	93.3		mg/L	30	28	93.3				90	110	
MB	Chloride	05/09/2022 08:54:45	<2.0		mg/L									
MB	Chloride	05/09/2022 10:20:56	<2.0		mg/L									
MB	Chloride	05/09/2022 09:18:39	<2.0		mg/L									
908002 MS-F	Fluoride	05/04/2022 14:32:14		1.12	mg/L	0.5	1.59	94				80	120	
908002 MSD-F	Fluoride	05/04/2022 14:38:10		1.12	mg/L				1.59	94	0	80	120	20
CRM-F	Fluoride	05/04/2022 11:24:00	103		mg/L	3.3	3.4	103				83.92	111.19	
LFB-F	Fluoride	05/04/2022 17:01:32	100		mg/L	0.5	0.5	100				90	110	
LFB-F	Fluoride	05/04/2022 11:36:53	100		mg/L	0.5	0.5	100				90	110	
MB-F	Fluoride	05/04/2022 16:55:11	<0.1		mg/L									
MB-F	Fluoride	05/04/2022 11:30:26			mg/L									
849004 MS	Sulfate	05/05/2022 11:56:45		662	mg/L	500	987	64.9				85	115	
849004 MSD	Sulfate	05/05/2022 11:57:51		662	mg/L				993	66.1	0.61	85	115	20
901007 MS	Sulfate	05/05/2022 12:24:51		180	mg/L	1000	1100	92				85	115	-
901007 MSD	Sulfate	05/05/2022 12:25:57		180	mg/L			-	1110	92.8	0.9	85	115	20
LFB	Sulfate	05/05/2022 12:28:09			mg/L	100	90.1	90.1				85	115	
LFB	Sulfate	05/05/2022 12:09:25			mg/L	100	91.8	91.8				85	115	
MB	Sulfate	05/05/2022 12:27:03			mg/L									
MB	Sulfate	05/05/2022 12:08:19			mg/L									
399003 DUP	Total Dissolved Solids	03/29/2022 11:30:00		2140	mg/L						1.89			20
926002 DUP	Total Dissolved Solids	05/05/2022 10:00:00		5880	mg/L						1.72			20
927006 DUP	Total Dissolved Solids	05/05/2022 10:00:00		2140	mg/L						0.94			20
CRM	Total Dissolved Solids	05/05/2022 10:00:00			mg/L	736	760	103			0.0	90.35	110.33	
MB	Total Dissolved Solids	05/05/2022 10:00:00			mg/L	. 00	. 00	.00				55.55		
908003 DUP	pH	05/04/2022 15:00:46		7.4	units						3.44			
CRM-PH	pH	05/04/2022 10:54:16		•	units	6	6	100.83			2.11	99.17	100.83	
CRM-PH	pH	05/04/2022 17:19:00			units	6	6	100.17				99.17	100.83	
OINW-I II	hi i	00,04,2022 17.19.00	100.17		uiiio	U	U	100.17				99.17	100.00	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Spring 2022 (908) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

908002 (MW1-90) - Paying sample

Total and dissolved selenium results have been rechecked.





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.689	mg/L	0.1	5	05/05/2022 08:13	05/11/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	
Arsenic	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:42	MDE	MA,NDA	
Barium	0.0107	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:18	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	
Chromium	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:42	MDE	MA,NDA	
Cobalt	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:42	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	
Molybdenum	0.0020	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	
Selenium	0.0224	mg/L	0.01	10	05/05/2022 08:13	05/19/2022 14:42	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:02	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908002
 Date Collected:
 05/03/2022 13:45
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA,	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.702	mg/L	0.1	5	05/05/2022 08:13	05/11/2022 11:05	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Arsenic	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:45	MDE	MA,NDA	
Barium	0.0070	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:24	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Selenium	0.0170	mg/L	0.005	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:14	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	1.07	mg/L	0.1	5	05/05/2022 08:13	05/11/2022 11:07	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	
Arsenic	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:47	MDE	MA,NDA	
Barium	0.0085	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:25	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	
Chromium	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:47	MDE	MA,NDA	
Cobalt	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:47	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	
Selenium	0.0784	mg/L	0.01	10	05/05/2022 08:13	05/19/2022 14:47	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:17	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908004
 Date Collected:
 05/03/2022 09:18
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA,	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.238	mg/L	0.02	1	05/05/2022 08:13	05/11/2022 11:09	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Barium	0.0103	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:26	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Selenium	0.1246	mg/L	0.005	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:20	MDE	MA,NDA	

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Report Date: Wednesday, June 29, 2022 10:27:02 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908005
 Date Collected:
 05/02/2022 12:57
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.757	mg/L	0.1	5	05/05/2022 08:13	05/11/2022 11:11	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Barium	0.0102	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:28	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Selenium	0.0570	mg/L	0.005	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:23	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908006
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.685	mg/L	0.1	5	05/05/2022 08:13	05/11/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	
Arsenic	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:50	MDE	MA,NDA	
Barium	0.0098	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:29	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	
Chromium	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:50	MDE	MA,NDA	
Cobalt	<0.004	mg/L	0.004	10	05/05/2022 08:13	05/19/2022 14:50	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	
Molybdenum	0.0020	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	
Selenium	0.0212	mg/L	0.01	10	05/05/2022 08:13	05/19/2022 14:50	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:25	MDE	MA,NDA	

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Report Date: Wednesday, June 29, 2022 10:27:02 AM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:908007Date Collected:05/03/2022 12:50Matrix:GroundwaterSample ID:Field BlankDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	<0.02	mg/L	0.02	1	05/05/2022	05/11/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Barium	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/20/2022 11:30	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	05/05/2022 08:13	05/19/2022 12:28	MDE	MA,NDA	

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Account #:

2800

Client: Montana-Dakota Utilities - Bismarck



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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May 6, 2022

Montana-Dakota Utilities **Todd Peterson** 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From May 2-3, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 5 wells. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

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

Wednesday, June 29, 2022 10:27:02 AM Report Date:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	2616 E. B	ota Valley To roadway Ave , ND 58501 9720	esting La	aborate	orie	es					19 – Dakot : 908	a Utilities –	Bis	Cha	in of Custody Record
Report To:	MDU			CC:								Project Na	ame:	1	MDU Heskett
Attn: Address:	Todd Peterson 400 N. 4th St Bismarck, ND 58501											Event:			Spring 2022
Phone: Email:	701-425-2427 Todd.Peterson@mdu.c	om										Sampled I		cremy	Layer
	Sam	ple Information	1				Sar	nple Cor	tainers			Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HN03	뒽	250 mL H2SO4			Temp (°C)	Spec. Cond.	Нф	Turbidity (NTU)	Analysis Required
001	MW13	2 May 22	0900	GW	X	X	X	x	$\Pi\Pi$		7.47	9688	6.94	3.00	
002	MW1-90	3 May 22	1345	GW	X	X	х	x			6.77	7558	6,85	0.12	
003	MW2-90	3 May 22	1150	GW	X	X	X	x			7.84	7294	6.94	0.20	
004	MW3-90	3 Marzz	0918	GW	X	X	X	x	1 1		6.03	4775	6.91	0.64	MDU Heskett List
- 15	MW80R	2 May 22	1257	GW	X	X	X	x		-	8.30	4784	6.93	0.24	WIDO HESKETT LIST
005					1 34	1	V	V			2 1/2	9688	6.94	3.00	
000	Dup 1	2 May 22	0900	GW	X	X	X	X			7.47	1000	6.17	3,00	

Sample Condition

Temp (°C)

TM562 / TM805

Location, Log In Walk In #2

Date/Time

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Received By

Name

Date/Time

4Mays

Relinquished By

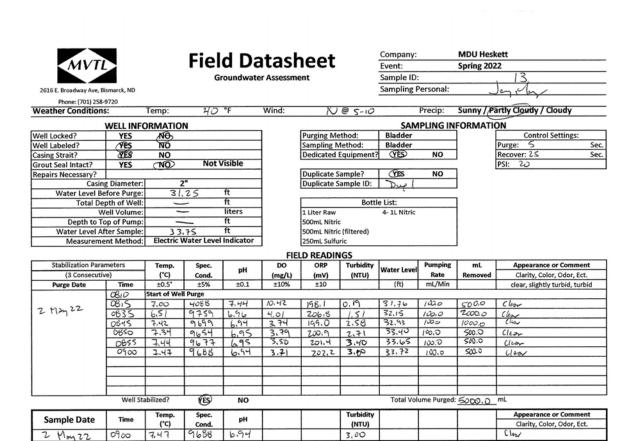


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Report Date: Wednesday, June 29, 2022 10:27:02 AM

Comments:

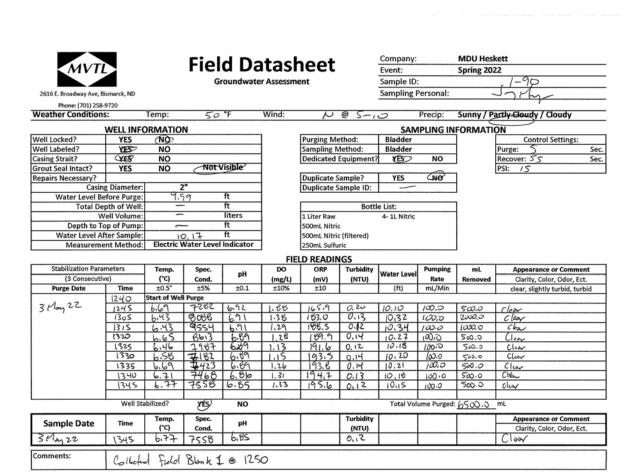


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2022

 Sample ID:
 2-90

 Sampling Personal:
 June 100

Sunny / Partly Cloudy / Cloudy

Purge:

Control Settings:

Sec.

Weather Conditions: Temp: WELL INFORMATION Well Locked? YES 440 Well Labeled? NO Casing Strait? YES NO Not Visible Grout Seal Intact? YES NO Repairs Necessary? Casing Diameter: Water Level Before Purge: Total Depth of Well: Well Volume liters Depth to Top of Pump: ft Water Level After Sample: Measurement Method: Electric Water Le vel Indicator

SAMPLING INFORMATION

Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? YES NO

PSI

Precip:

Duplicate Sample? YES NO
Duplicate Sample ID:

Bottle List:
1 Liter Raw 4- 1L Nitric
500mL Nitric
500mL Nitric (filtered)
250mL Sulfuric

FIELD READINGS

Stabilization Para	ameters	Temp.	Spec.	pH	1 00	OKP	Turbiaity	Water Level	Pumping	m L	Appearance or Comment
(3 Consecuti	ive)	(°C)	Cond.	PΠ	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	(050	Start of Wel	l Purge								
3 My 22	1055	7.31	7500	7.01	5.00	210.1	0.86	21.61	10.0	500.0	Class
7	1115 7.77		7020	6,95	3.65	202.3	0,15	21.67	120.0	2000.0	Clear
	1125 7.72		6654	6.96	3.95	182.0	0.29	21.90	100.0	1000.0	Clear
1	1130	7.68	6516	6.96	4.01	176.0	0.16	21,91	100.0	50.0	Clear
	1135	7.69	6338	6.96	3,75	1707	0,13	21.92	1000	500.0	Clear
	1140	7.79	6987	6,95	3.98	170.3	0.15	21,93	180.0	500.0	Clear
	1145	7.B1	7118	6.94	4.01	170.6	0,17	21.94	100:00	5000	Clear
1	1150	7.84	7294	6.94	4.12	170.9	0,20	21.94	100.0	500,0	Cla
										L .	
	Well St	abilized?	(YES)	NO				Total Vol	ume Purged:	500.0	mL

Sample Date	Time	Temp.	Spec.	pН	Turbidity	1	Appearance or Comment
oup.o o o c		(·c)	Cond.		(NTU)		Clarity, Color, Odor, Ect.
3 May 22	1150	7.84	7294	6,94	0.20		Clear

Comments:

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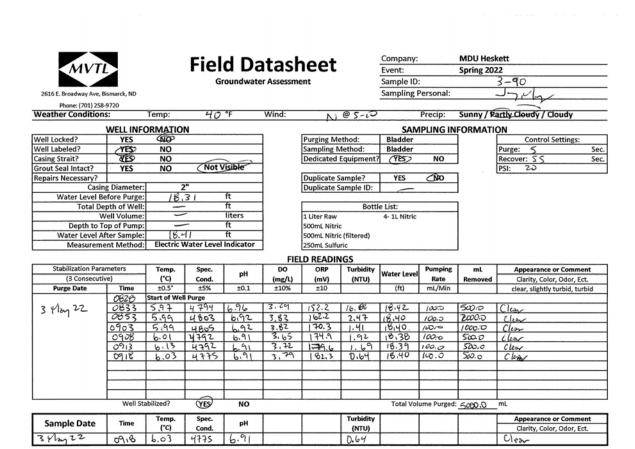


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Report Date: Wednesday, June 29, 2022 10:27:02 AM

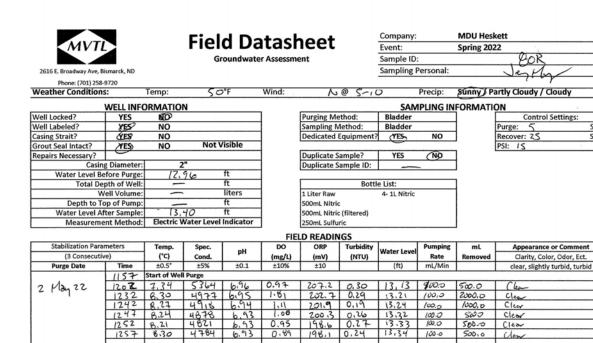
Comments



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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck



0.89

Sample Date (°C) (NTU) Clarity, Color, Odor, Ect. Cond 1257 2 May 22 8.30 4784 .93 Comments:

198,1

0.24

Turbidity

13,34

100.0

Total Volume Purged: 50000 mL

Cles

Appearance or Comment

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Wednesday, June 29, 2022 10:27:02 AM Report Date:

1257

4784

(FES)

Spec.

NO





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Surface water Assessment

Company: MDU Lewis & Clark
Event: Spring 2022

Sampling Personal:

Weather Conditions		45	°F	Wind:	N	@ 5-10	Precip: Sunny / Partly Cloudy / Clou				
Well ID	Date	Time	Casing Diameter	Water Level (ft)			Cor	nments			
MW70		1130	2"	21.78							
MW33		1150	2"	42.76							
MW101		1132	2"	37.94							
MW102	2 May 22	1128	2"	19.50							
MW103		1140	2"	36,74							
MW44R		1137	2"	27.14							
MW104		1147	2"	14.18							
MW105		1154	2"	11.78							

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Original Sampl QC Type	Analyte	Analysis Date	QC Result	Original Sam	ple Re Units	Spike Amoı Spi	=	ike % Recov⊦Spike	Duplicate Spik	e Duplicate RPD	(%) Lower (Control Limi Upper	Control Limi RPD L	_imit (%)
908001 MS	Antimony	05/19/2022 12:05:00	106.3	<1	ug/L	400	425	106.3				75	125	
908001 MSD	Antimony	05/19/2022 12:08:00	107.7	<1	ug/L				431	107.7	1.4	75	125	2
LFB-MS	Antimony	05/19/2022 11:55:00	99.6		ug/L	100	99.6	99.6				80	120	
LFB-MS	Antimony	05/20/2022 15:03:01	108		ug/L	100	108	108				85	115	
LFB-MS	Antimony	05/19/2022 14:11:00	102.9		ug/L	100	103	102.9				80	120	
MB	Antimony	05/19/2022 12:43:00	<1.00		ug/L									
MB	Antimony	05/19/2022 11:29:00	<1.00		ug/L									
MB	Antimony	05/20/2022 15:00:02	<1.00		ug/L									
908001 MS	Arsenic	05/19/2022 12:05:00		<4	ug/L	400.	418.	104.5						
908001 MSD	Arsenic	05/19/2022 12:08:00		<4	ug/L				417.	104.2	0.2			2
LFB-MS	Arsenic	05/20/2022 15:03:01	102.3		ug/L	100	102	102.3		102.3		85	115	
LFB-MS	Arsenic	05/19/2022 11:55:00	97		ug/L	100	97	97		97		80	120	
LFB-MS	Arsenic	05/19/2022 14:11:00	98.4		ug/L	100	98.4	98.4		98.4		80	120	
MB	Arsenic	05/19/2022 12:43:00	<2.00		ug/L									
MB	Arsenic	05/19/2022 11:29:00	<2.00		ug/L									
MB	Arsenic	05/20/2022 15:00:02	<2.00		ug/L									
908001 MS	Barium	05/19/2022 12:05:00	93.9	0.0107	ug/L	400	386	93.9				75	125	
908001 MSD	Barium	05/19/2022 12:08:00	93.4	0.0107	ug/L				384	93.4	0.5	75	125	2
LFB-MS	Barium	05/19/2022 11:55:00	97.3		ug/L	100	97.3	97.3				80	120	
LFB-MS	Barium	05/20/2022 15:03:01	106.6		ug/L	100	106	106.6				85	115	
LFB-MS	Barium	05/19/2022 14:11:00	97.2		ug/L	100	97.2	97.2				80	120	
MB	Barium	05/19/2022 12:43:00	<2.00		ug/L									
MB	Barium	05/19/2022 11:29:00	<2.00		ug/L									
MB	Barium	05/20/2022 15:00:02	<2.00		ug/L									
908001 MS	Beryllium	05/20/2022 11:20:00	101.4	<0.5	ug/L	400	406	101.4				75	125	
908001 MSD	Beryllium	05/20/2022 11:21:00	99.4	<0.5	ug/L				398	99.4	2	75	125	2
LFB-MS	Beryllium	05/20/2022 15:03:01	105.6		ug/L	100	106	105.6				85	115	
LFB-MS	Beryllium	05/20/2022 11:16:00	96.1		ug/L	100	96.1	96.1				80	120	
LFB-MS	Beryllium	05/20/2022 11:39:36	114.1		ug/L	100	114	114.1				80	120	
MB	Beryllium	05/20/2022 11:38:18	<0.500		ug/L									
MB	Beryllium	05/20/2022 11:14:00	< 0.500		ug/L									
MB	Beryllium	05/20/2022 15:00:02	<0.500		ug/L									
908001 MS	Cadmium	05/19/2022 12:05:00	99.2	<0.5	ug/L	400	397	99.2				75	125	
908001 MSD	Cadmium	05/19/2022 12:08:00	100.4	<0.5	ug/L				401	100.4	1	75	125	2
LFB-MS	Cadmium	05/19/2022 11:55:00	100.6		ug/L	100	101	100.6		100.6		80	120	
LFB-MS	Cadmium	05/20/2022 15:03:01	108.3		ug/L	100	108	108.3		108.3		85	115	
LFB-MS	Cadmium	05/19/2022 14:11:00	105.3		ug/L	100	105	105.3		105.3		80	120	
MB	Cadmium	05/20/2022 15:00:02	< 0.500		ug/L									
MB	Cadmium	05/19/2022 11:29:00	<0.500		ug/L									
MB	Cadmium	05/19/2022 12:43:00	< 0.500		ug/L									
908001 MS	Chromium	05/19/2022 12:05:00		<4	ug/L	400.	433.	108.2						
908001 MSD	Chromium	05/19/2022 12:08:00		<4	ug/L				429.	107.2	0.9			2
LFB-MS	Chromium	05/19/2022 14:11:00	102		ug/L	100	102	102				80	120	
LFB-MS	Chromium	05/19/2022 11:55:00	98.8		ug/L	100	98.8	98.8				80	120	
LFB-MS	Chromium	05/20/2022 15:03:01	107.5		ug/L	100	107	107.5				85	115	
MB	Chromium	05/19/2022 12:43:00	<2.00		ug/L									
MB	Chromium	05/20/2022 15:00:02	<2.00		ug/L									
MB	Chromium	05/19/2022 11:29:00	<2.00		ug/L									

908001 MS	Cobalt	05/19/2022 12:05:00		<4	ug/L	400.	420.	105.						
908001 MSD	Cobalt	05/19/2022 12:08:00		<4	ug/L				415.	103.8	1.2			20
LFB-MS	Cobalt	05/19/2022 14:11:00	101.7		ug/L	100	102	101.7				80	120	
LFB-MS	Cobalt	05/20/2022 15:03:01	106.3		ug/L	100	106	106.3				85	115	
LFB-MS	Cobalt	05/19/2022 11:55:00	98		ug/L	100	98	98				80	120	
MB	Cobalt	05/20/2022 15:00:02	<2.00		ug/L									
MB	Cobalt	05/19/2022 11:29:00	<2.00		ug/L									
MB	Cobalt	05/19/2022 12:43:00	<2.00		ug/L									
908001 MS	Lead	05/19/2022 12:05:00	92.1	<0.5	ug/L	400	368	92.1				75	125	
908001 MSD	Lead	05/19/2022 12:08:00	92.6	<0.5	ug/L				370	92.6	0.5	75	125	20
LFB-MS	Lead	05/20/2022 15:03:01	106.2		ug/L	100	106	106.2				85	115	
LFB-MS	Lead	05/19/2022 11:55:00	96.4		ug/L	100	96.4	96.4				80	120	
LFB-MS	Lead	05/19/2022 14:11:00	100.7		ug/L	100	101	100.7				80	120	
MB	Lead	05/20/2022 15:00:02	< 0.500		ug/L									
MB	Lead	05/19/2022 11:29:00	< 0.500		ug/L									
MB	Lead	05/19/2022 12:43:00	< 0.500		ug/L									
908001 PDS	Lithium	05/11/2022 11:02:00	94.4	0.689	mg/L	2	2.576	94.4				75	125	
908001 PDSD	Lithium	05/11/2022 11:04:00	97.7	0.689	mg/L				2.642	97.7	2.53	75	125	20
LFB-OE	Lithium	05/11/2022 10:58:48	105		mg/L	0.4	0.4199	105				85	115	
MB	Lithium	05/11/2022 10:57:03	<0.04		mg/L									
908007 MS	Mercury	05/05/2022 08:00:00	97.1	<0.2	ug/L	2	1.942	97.1				70	130	
908007 MSD	Mercury	05/05/2022 08:00:00	99.2	<0.2	ug/L				1.984	99.2	2.14	70	130	20
LFB	Mercury	05/05/2022 08:00:00	98.4		ug/L	2	1.968	98.4				85	115	
LFB	Mercury	05/05/2022 08:00:00	102		ug/L	2	2.037	102				85	115	
LRB	Mercury	05/05/2022 08:00:00	<0.2		ug/L									
LRB	Mercury	05/05/2022 08:00:00	<0.2		ug/L									
908001 MS	Molybdenum	05/19/2022 12:05:00	104.1	<2	ug/L	400	418	104.1				75	125	
908001 MSD	Molybdenum	05/19/2022 12:08:00	105.9	<2	ug/L				426	105.9	1.9	75	125	20
LFB-MS	Molybdenum	05/19/2022 14:11:00	103.9		ug/L	100	104	103.9				80	120	
LFB-MS	Molybdenum	05/19/2022 11:55:00	99.7		ug/L	100	99.7	99.7				80	120	
LFB-MS	Molybdenum	05/20/2022 15:03:01	108.4		ug/L	100	108	108.4				85	115	
MB	Molybdenum	05/19/2022 11:29:00	<2.00		ug/L									
MB	Molybdenum	05/19/2022 12:43:00	<2.00		ug/L									
MB	Molybdenum	05/20/2022 15:00:02	<2.00		ug/L									
908001 MS	Selenium	05/19/2022 12:05:00		22.4	ug/L	400.	484.	115.4						
908001 MSD	Selenium	05/19/2022 12:08:00		22.4	ug/L				466.	110.9	3.8			20
LFB-MS	Selenium	05/20/2022 15:03:01	108		ug/L	100	108	108				85	115	
LFB-MS	Selenium	05/19/2022 11:55:00	95		ug/L	100	95	95				80	120	
LFB-MS	Selenium	05/19/2022 14:11:00	100.2		ug/L	100	100	100.2				80	120	
MB	Selenium	05/19/2022 11:29:00	<5.00		ug/L									
MB	Selenium	05/19/2022 12:43:00	<5.00		ug/L									
MB	Selenium	05/20/2022 15:00:02	<5.00		ug/L									
908001 MS	Thallium	05/19/2022 12:05:00	89.7	<0.5	ug/L	400	359	89.7				75	125	
908001 MSD	Thallium	05/19/2022 12:08:00	91.7	<0.5	ug/L				367	91.7	2.2	75	125	20
LFB-MS	Thallium	05/19/2022 11:55:00	94.9		ug/L	100	94.9	94.9				80	120	
LFB-MS	Thallium	05/20/2022 15:03:01	102.3		ug/L	100	102	102.3				85	115	
LFB-MS	Thallium	05/19/2022 14:11:00	98.3		ug/L	100	98.3	98.3				80	120	
MB	Thallium	05/19/2022 11:29:00	<0.500		ug/L									
MB	Thallium	05/20/2022 15:00:02	<0.500		ug/L									
MB	Thallium	05/19/2022 12:43:00	<0.500		ug/L									



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Spring 2022 (908) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Report Date: Thursday, June 30, 2022 8:25:26 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Sample Comments

908002 (MW1-90) - Sample

Total and dissolved selenium results have been rechecked.

Analysis Results Comments

908001 (MW13)

Sample required dilution due to matrix. Reporting limit has been raised.

(Nitrate + Nitrite as N)

908001 (MW13)

Sample analyzed beyond holding time.(pH)

908002 (MW1-90)

Sample analyzed beyond holding time.(pH)

908003 (MW2-90)

Sample analyzed beyond holding time.(pH)

908004 (MW3-90)

Sample analyzed beyond holding time (pH)

908005 (MW80R)

Sample analyzed beyond holding time.(pH)

908006 (Dup 1)

Sample required dilution due to matrix. Reporting limit has been raised.

(Nitrate + Nitrite as N)

908006 (Dup 1)

Sample analyzed beyond holding time.(pH)

908007 (Field Blank)

Sample analyzed beyond holding time.(pH)



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908001 **Date Collected:** 05/02/2022 09:00 Matrix: Groundwater Sample ID: MW13 Date Received: 05/04/2022 08:10 MVTL Field Service Collector:

By JSM By JSM By JSM EJV	Cert Cert Cert MA,NDA	Qual
By JSM By JSM	Cert	Qual
JSM By JSM	Cert	Qual
JSM By JSM	Cert	Qual
By JSM By	Cert	· ·
JSM	Cert	· ·
JSM	Cert	· ·
Ву		Qual
		Qual
		Qual
EJV	MA,NDA	_
Ву	Cert	Qual
JSM		
Ву	Cert	Qual
MDE	MA,NDA	
Ву	Cert	Qual
EJV	MA,NDA	*
Ву	Cert	Qual
CDD		
	By By EJV	By Cert MDE MA,NDA By Cert EJV MA,NDA

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Thursday, June 30, 2022 8:25:26 AM Report Date:



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
0.64	mg/L	0.5	5	05/05/2022 08:53	05/11/2022 13:38	SLZ	MA,NDA	
401	mg/L	5	5	05/05/2022 08:13	05/10/2022 09:56	MDE	MA,NDA	
<0.5	mg/L	0.5	5	05/05/2022 08:53	05/05/2022 12:57	SLZ	MA,NDA	
631	mg/L	5	5	05/05/2022 08:13	05/10/2022 09:56	MDE	MA,NDA	
<0.25	mg/L	0.25	5	05/05/2022 08:53	05/05/2022 12:57	SLZ	MA,NDA	
31.8	mg/L	5	5	05/05/2022 08:13	05/10/2022 09:56	MDE	MA,NDA	
1970	mg/L	20	20	05/05/2022 08:13	05/10/2022 11:12	MDE	MA,NDA	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:35	MDE	MA,NDA	
0.0077	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:35	MDE	MA,NDA	
<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:35	MDE	MA,NDA	
	0.64 401 <0.5 631 <0.25 31.8 1970 Results <0.002 0.0077	0.64 mg/L 401 mg/L <0.5	0.64 mg/L 0.5 401 mg/L 5 <0.5	0.64 mg/L 0.5 5 401 mg/L 5 5 <0.5	0.64 mg/L 0.5 5 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:13 05/05/2022 08:13 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:13 401 mg/L 5 5 05/05/2022 08:53 05/05/2022 08:53 05/05/2022 08:13 402 mg/L 5 5 05/05/2022 08:13 05/05/2022 08:13 403 mg/L 20 20 20 05/05/2022 08:13 05/05/2022 08:53	0.64 mg/L 0.5 5 05/05/2022 05/11/2022 05/11/2022 08:53 13:38 401 mg/L 5 5 05/05/2022 05/10/2022 05/10/2022 05:56 <0.5 mg/L 0.5 5 05/05/2022 05/05/2022 05/05/2022 05:05/2022 05:05/2022 08:53 12:57 631 mg/L 5 5 05/05/2022 05/05/2022 05/10/2022 05:05/2022 05:	0.64 mg/L 0.5 5 05/05/2022 05/11/2022 05/11/2022 08:53 05/11/2022 05/10/2022 05/10/2022 05/10/2022 05/10/2022 08:13 MDE 401 mg/L 5 5 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/10/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/10/2022	0.64 mg/L 0.5 5 05/05/2022 05/11/2022 05/10/2022 05/10/2022 MA,NDA 401 mg/L 5 5 05/05/2022 05/10/2022 05/10/2022 05/10/2022 05/10/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/10/2022 05/10/2022 05/10/2022 05/10/2022 05/10/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/10

05/05/2022

05/05/2022

05/05/2022

08:53

08:53 05/05/2022

08:53

08:53 05/05/2022

08:53

05/18/2022

05/18/2022

05/18/2022

06/16/2022

05/18/2022

15:35

15:35

15:35

13:56

15:35

MDE

MDE

MDE

MDE

MDE

MA,NDA

MA,NDA

MA,NDA

MA,NDA

MA,NDA

Silver, Dissolved

Chromium, Dissolved

Molybdenum, Dissolved

Selenium, Dissolved

Lead, Dissolved

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	142	meq/L		1	06/29/2022 09:38	06/29/2022 09:38	CW		
Cation Summation	158	meq/L		1	06/29/2022 09:38	06/29/2022 09:38	CW		
Percent Difference	5.46	%		1	06/29/2022 09:38	06/29/2022 09:38	CW		
TDS - Summation	9630	mg/L	12.5	1	06/29/2022 09:39	06/29/2022 09:39	CW		

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Report Date: Thursday, June 30, 2022 8:25:26 AM

< 0.002

<0.0005

0.0023

0.0218

<0.0005

mg/L

mg/L

mg/L

mg/L

mg/L

0.002

0.0005

0.002

0.005

0.0005

5

5

5

5



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:39	05/04/2022 13:39	RAA		
Alkalinity, Total	527	mg/L as CaCO3	20.5	1	05/04/2022 13:39	05/04/2022 13:39	RAA	MA,NDA	
Bicarbonate	527	mg/L as CaCO3	20.5	1	05/04/2022 13:39	05/04/2022 13:39	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:39	05/04/2022 13:39	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:39	05/04/2022 13:39	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3600	mg/L as CaCO3	6.62	1	06/29/2022 09:38	06/29/2022 09:38	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	9874	umhos/cm	1	1	05/04/2022 13:39	05/04/2022 13:39	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.3	units	0.1	1	05/04/2022 13:39	05/04/2022 13:39	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	79.2	mg/L	2	1	05/09/2022 09:08	05/09/2022 09:08	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.76	mg/L	0.1	1	05/04/2022 13:39	05/04/2022 13:39	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	14.3		0.17	1	06/29/2022 09:38	06/29/2022 09:38	CW		

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Report Date: Thursday, June 30, 2022 8:25:26 AM



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



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:908002Date Collected:05/03/2022 13:45Matrix:GroundwaterSample ID:MW1-90Date Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: 120.1													
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual				
Specific Conductance - Field	7558	umhos/cm	1	1	05/03/2022 13:45	05/03/2022 13:45	JSM						
Method: 150.2													
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual				
pH - Field	6.85	units	0.01	1	05/03/2022 13:45	05/03/2022 13:45	JSM						
Method: 170.1													
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual				
Temperature - Field C	6.77	degrees C		1	05/03/2022 13:45	05/03/2022 13:45	JSM						

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6490	mg/L	250	50	05/05/2022 12:32	05/05/2022 12:32	EJV	MA,NDA	

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.12	NTU	0.1	1	05/03/2022 13:45	05/03/2022 13:45	JSM		

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	15.4	mg/L	1	5	05/05/2022 08:54	05/05/2022 08:54	EJV	MA,NDA	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Phosphorus as P	<0.2	mg/L	0.2	1	05/05/2022 11:00	05/05/2022 14:37	SRD	MA,NDA	

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Report Date: Thursday, June 30, 2022 8:25:26 AM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908002
 Date Collected:
 05/03/2022 13:45
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/11/2022 13:40	SLZ	MA,NDA	
Calcium	392	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:02	MDE	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/05/2022 12:59	SLZ	MA,NDA	
Magnesium	909	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:02	MDE	MA,NDA	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/05/2022 08:53	05/05/2022 12:59	SLZ	MA,NDA	
Potassium	31.0	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:02	MDE	MA,NDA	
Sodium	1620	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:02	MDE	MA,NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Barium, Dissolved	0.0072	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	
Selenium, Dissolved	0.0224	mg/L	0.005	5	05/05/2022 08:53	06/16/2022 13:53	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:39	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	147	meq/L		1	06/29/2022 09:40	06/29/2022 09:40	CW		
Cation Summation	165	meq/L		1	06/29/2022 09:40	06/29/2022 09:40	CW		
Percent Difference	6.03	%		1	06/29/2022 09:40	06/29/2022 09:40	CW		
TDS - Summation	9780	mg/L	12.5	1	06/29/2022 09:40	06/29/2022 09:40	CW		

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Report Date: Thursday, June 30, 2022 8:25:26 AM

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908002
 Date Collected:
 05/03/2022 13:45
 Matrix:
 Groundwater

 Sample ID:
 MW1-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: SM2320 B-2011

Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:15	05/04/2022 14:15	RAA		
Alkalinity, Total	390	mg/L as CaCO3	20.5	1	05/04/2022 14:15	05/04/2022 14:15	RAA	MA,NDA	
Bicarbonate	390	mg/L as CaCO3	20.5	1	05/04/2022 14:15	05/04/2022 14:15	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:15	05/04/2022 14:15	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:15	05/04/2022 14:15	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	4720	mg/L as CaCO3	6.62	1	06/29/2022 09:40	06/29/2022 09:40	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	9685	umhos/cm	1	1	05/04/2022 14:15	05/04/2022 14:15	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.4	units	0.1	1	05/04/2022 14:15	05/04/2022 14:15	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	90.7	mg/L	2	1	05/09/2022 09:09	05/09/2022 09:09	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.12	mg/L	0.1	1	05/04/2022 14:15	05/04/2022 14:15	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	10.2		0.17	1	06/29/2022 09:40	06/29/2022 09:40	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Method: 120.1 Parameter Results Units RDL DF Prepared Analyzed By Cert	Temp @ Receipt (C): 2.3	R	eceived on Ice	: Yes						
Parameter Results Units RDL DF Prepared Analyzed By Cert										
Method: 150.2 Parameter Results Units RDL DF Prepared Analyzed By Cert		Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert	Specific Conductance - Field	7294	umhos/cm	1	1			JSM		
pH - Field 6.94 units 0.01 1 05/03/2022 11:50 05/03/2022 11:50 JSM Method: 170.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Temperature - Field C 7.84 degrees C 1 05/03/2022 05/03/2022 11:50 JSM Method: ASTM D516-11 Parameter Parameter Results Units RDL DF Prepared Analyzed By Cert Sulfate 4830 mg/L 100 20 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/05/2022 05/03/2022 05/03/2022 05/03/2022 05/03/2022 05/03/2022 05/03/2022 05/05/2022 05/05/2022 05/05/2022 08:00 JSM Method: EPA 245.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Method: EPA 353.2 Parameter Results Units RDL DF Prepared Analyzed By Cert Nitrate + Nitrite as N	Method: 150.2									
Method: 170.1	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter	pH - Field	6.94	units	0.01	1			JSM		
Temperature - Field C	Method: 170.1									
Method: ASTM D516-11	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert	Temperature - Field C	7.84	degrees C	;	1			JSM		
Sulfate 4830 mg/L 100 20 05/05/2022 12:19 05/05/2022 12:19 EJV MA,NDA Method: EPA 180.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Turbidity - Field 0.2 NTU 0.1 1 05/03/2022 11:50 05/03/2022 11:50 JSM Method: EPA 245.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Mercury, Dissolved <0.0002	Method: ASTM D516-11									
Method: EPA 180.1 Results Units RDL DF Prepared Analyzed By Cert Turbidity - Field 0.2 NTU 0.1 1 05/03/2022 11:50 05/03/2022 11:50 JSM Method: EPA 245.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Mercury, Dissolved <0.0002	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert Turbidity - Field 0.2 NTU 0.1 1 05/03/2022 11:50 05/03/2022 11:50 JSM Method: EPA 245.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Mercury, Dissolved <0.0002	Sulfate	4830	mg/L	100	20			EJV	MA,NDA	
Turbidity - Field 0.2 NTU 0.1 1 05/03/2022 11:50 05/03/2022 11:50 JSM Method: EPA 245.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Mercury, Dissolved <0.0002	Method: EPA 180.1									
Method: EPA 245.1 Results Units RDL DF Prepared Prepared Analyzed Analyzed Prepared P	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert Mercury, Dissolved <0.0002	Turbidity - Field	0.2	NTU	0.1	1			JSM		
Mercury, Dissolved <0.0002 mg/L 0.0002 1 05/05/2022 08:00 05/05/2022 08:00 MDE MA,NDA Method: EPA 353.2 Parameter Results Units RDL DF Prepared Analyzed By Cert Nitrate + Nitrite as N 34.1 mg/L 2 10 05/05/2022 08:56 05/05/2022 08:56 EJV MA,NDA Method: EPA 365.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as P <0.2	Method: EPA 245.1									
Mercury, Dissolved < 0.0002 mg/L 0.0002 1 08:00 08:00 MDE MA,NDA Method: EPA 353.2 Parameter Results Units RDL DF Prepared Analyzed By Cert Nitrate + Nitrite as N 34.1 mg/L 2 10 05/05/2022 08:56 08:56 EJV MA,NDA Method: EPA 365.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as Parameter C0.2 mg/L 0.2 1 05/05/2022 05/05/2022 SRD MA NDA	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert Nitrate + Nitrite as N 34.1 mg/L 2 10 05/05/2022 08:56 05/05/2022 08:56 EJV MA,NDA Method: EPA 365.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as P <0.2	Mercury, Dissolved	<0.0002	mg/L	0.0002	1			MDE	MA,NDA	
Nitrate + Nitrite as N 34.1 mg/L 2 10 05/05/2022 08:56 05/05/2022 08:56 EJV MA,NDA Method: EPA 365.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as P <0.2	Method: EPA 353.2									
Method: EPA 365.1 Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as P <0.2	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter Results Units RDL DF Prepared Analyzed By Cert Phosphorus as P. 50.2 mg/l 0.2 1 05/05/2022 SRD MANDA	Nitrate + Nitrite as N	34.1	mg/L	2	10			EJV	MA,NDA	
Phosphorus as P <0.2 mg/l 0.2 1 05/05/2022 SPD MANDA	Method: EPA 365.1									
Phoephorus as D 200 mg/l 000 1	Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
	Phosphorus as P	<0.2	mg/L	0.2	1			SRD	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/11/2022 13:42	SLZ	MA,NDA	
Calcium	451	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:04	MDE	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/05/2022 13:02	SLZ	MA,NDA	
Magnesium	824	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:04	MDE	MA,NDA	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/05/2022 08:53	05/05/2022 13:02	SLZ	MA,NDA	
Potassium	32.4	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:04	MDE	MA,NDA	
Sodium	854	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:04	MDE	MA,NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Barium, Dissolved	0.0089	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Chromium, Dissolved	0.0021	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	
Selenium, Dissolved	0.0845	mg/L	0.005	5	05/05/2022 08:53	06/16/2022 13:50	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:42	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	116	meq/L		1	06/29/2022 09:43	06/29/2022 09:43	CW		
Cation Summation	128	meq/L		1	06/29/2022 09:43	06/29/2022 09:43	CW		
Percent Difference	5.10	%		1	06/29/2022 09:43	06/29/2022 09:43	CW		
TDS - Summation	7420	mg/L	12.5	1	06/29/2022 09:43	06/29/2022 09:43	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908003
 Date Collected:
 05/03/2022 11:50
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: SM2320 B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:44	05/04/2022 14:44	RAA		
Alkalinity, Total	520	mg/L as CaCO3	20.5	1	05/04/2022 14:44	05/04/2022 14:44	RAA	MA,NDA	
Bicarbonate	520	mg/L as CaCO3	20.5	1	05/04/2022 14:44	05/04/2022 14:44	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:44	05/04/2022 14:44	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 14:44	05/04/2022 14:44	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	4520	mg/L as CaCO3	6.62	1	06/29/2022 09:43	06/29/2022 09:43	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	7454	umhos/cm	1	1	05/04/2022 14:44	05/04/2022 14:44	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.4	units	0.1	1	05/04/2022 14:44	05/04/2022 14:44	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	86.6	mg/L	2	1	05/09/2022 09:10	05/09/2022 09:10	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.01	mg/L	0.1	1	05/04/2022 14:44	05/04/2022 14:44	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	5.53		0.17	1	06/29/2022 09:43	06/29/2022 09:43	CW		

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



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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908004 05/03/2022 09:18 **Date Collected:** Matrix: Groundwater Cample ID. M/M/3 00 05/04/2022 08:10 MV/TL Field Service

Sample ID: MW3-90	Da	ate Received:	05/	04/2022	2 08:10	3:10 Collector: MVTL Field Service			
Temp @ Receipt (C): 2.3	Re	eceived on Ice	: Yes						
Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4775	umhos/cm	1	1	05/03/2022 09:18	05/03/2022 09:18	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.91	units	0.01	1	05/03/2022 09:18	05/03/2022 09:18	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.03	degrees C		1	05/03/2022 09:18	05/03/2022 09:18	JSM		
Method: ASTM D516-11									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	2470	mg/L	100	20	05/05/2022 12:20	05/05/2022 12:20	EJV	MA,NDA	
Method: EPA 180.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.64	NTU	0.1	1	05/03/2022 09:18	05/03/2022 09:18	JSM		
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA	
Method: EPA 353.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	05/05/2022 08:57	05/05/2022 08:57	EJV	MA,NDA	
Method: EPA 365.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Phosphorus as P	<0.2	mg/L	0.2	1	05/05/2022 11:00	05/05/2022 14:46	SRD	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908004
 Date Collected:
 05/03/2022 09:18
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	0.14	mg/L	0.1	1	05/05/2022 08:53	05/11/2022 13:48	SLZ	MA,NDA	
Calcium	506	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:06	MDE	MA,NDA	
Iron, Dissolved	<0.1	mg/L	0.1	1	05/05/2022 08:53	05/05/2022 13:04	SLZ	MA,NDA	
Magnesium	246	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:06	MDE	MA,NDA	
Manganese, Dissolved	<0.05	mg/L	0.05	1	05/05/2022 08:53	05/05/2022 13:04	SLZ	MA,NDA	
Potassium	17.0	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:06	MDE	MA,NDA	
Sodium	673	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:06	MDE	MA,NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Barium, Dissolved	0.0105	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	
Selenium, Dissolved	0.1113	mg/L	0.005	5	05/05/2022 08:53	06/16/2022 13:47	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:45	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	61.9	meq/L		1	06/29/2022 09:45	06/29/2022 09:45	CW		
Cation Summation	75.2	meq/L		1	06/29/2022 09:45	06/29/2022 09:45	CW		
Percent Difference	9.72	%		1	06/29/2022 09:45	06/29/2022 09:45	CW		
TDS - Summation	4230	mg/L	12.5	1	06/29/2022 09:45	06/29/2022 09:45	CW		

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908004 **Date Collected:** 05/03/2022 09:18 Matrix: Groundwater Sample ID: MW3-90 Date Received: 05/04/2022 08:10 MVTL Field Service Collector:

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:49	05/04/2022 15:49	RAA		
Alkalinity, Total	470	mg/L as CaCO3	20.5	1	05/04/2022 15:49	05/04/2022 15:49	RAA	MA,NDA	
Bicarbonate	470	mg/L as CaCO3	20.5	1	05/04/2022 15:49	05/04/2022 15:49	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:49	05/04/2022 15:49	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:49	05/04/2022 15:49	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	2280	mg/L as CaCO3	6.62	1	06/29/2022 09:45	06/29/2022 09:45	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	4886	umhos/cm	1	1	05/04/2022 15:49	05/04/2022 15:49	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.3	units	0.1	1	05/04/2022 15:49	05/04/2022 15:49	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	36.5	mg/L	2	1	05/09/2022 09:11	05/09/2022 09:11	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.11	mg/L	0.1	1	05/04/2022 15:49	05/04/2022 15:49	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	6.14		0.17	1	06/29/2022 09:45	06/29/2022 09:45	CW		

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908005 **Date Collected:** 05/02/2022 12:57 Matrix: Groundwater Sample ID: MW80R Date Received: 05/04/2022 08:10 MVTL Field Service Collector:

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4784	umhos/cm	1	1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.93	units	0.01	1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	8.3	degrees C		1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: ASTM D516-11									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	2910	mg/L	100	20	05/05/2022 12:21	05/05/2022 12:21	EJV	MA,NDA	
Method: EPA 180.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.24	NTU	0.1	1	05/02/2022 12:57	05/02/2022 12:57	JSM		
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA	
Method: EPA 353.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	23.5	mg/L	2	10	05/05/2022 09:03	05/05/2022 09:03	EJV	MA,NDA	
Method: EPA 365.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Phosphorus as P	<0.2	mg/L	0.2	1	05/05/2022 11:00	05/05/2022 14:47	SRD	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908005
 Date Collected:
 05/02/2022 12:57
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/11/2022 13:49	SLZ	MA,NDA	
Calcium	409	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:08	MDE	MA,NDA	
Iron, Dissolved	<0.1	mg/L	0.1	1	05/05/2022 08:53	05/05/2022 13:06	SLZ	MA,NDA	
Magnesium	558	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:08	MDE	MA,NDA	
Manganese, Dissolved	0.20	mg/L	0.05	1	05/05/2022 08:53	05/05/2022 13:06	SLZ	MA,NDA	
Potassium	<5	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:08	MDE	MA,NDA	
Sodium	618	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:08	MDE	MA,NDA	
Method: EPA 6020B									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:48	MDE	MA,NDA	
Barium, Dissolved	0.0112	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:48	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:48	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:48	MDE	MA,NDA	

08:53

08:53 05/05/2022

08:53 05/05/2022

08:53 05/05/2022

08:53

05/05/2022

15:48

15:48

13:44

13:44

15:48

05/18/2022

06/16/2022

06/16/2022

05/18/2022

MDE

MDE

MDE

MDE

MA,NDA

MA,NDA

MA,NDA

MA,NDA

Method: SM1030I

Silver, Dissolved

Lead, Dissolved

Molybdenum, Dissolved

Selenium, Dissolved

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	77.6	meq/L		1	06/29/2022 09:47	06/29/2022 09:47	CW		
Cation Summation	93.4	meq/L		1	06/29/2022 09:47	06/29/2022 09:47	CW		
Percent Difference	9.22	%		1	06/29/2022 09:47	06/29/2022 09:47	CW		
TDS - Summation	5010	mg/L	12.5	1	06/29/2022 09:47	06/29/2022 09:47	CW		

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Report Date: Thursday, June 30, 2022 8:25:26 AM

<0.0005

<0.002

0.0595

<0.0005

mg/L

mg/L

mg/L

mg/L

0.0005

0.002

0.005

0.0005

5

5

5



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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908005 **Date Collected:** 05/02/2022 12:57 Matrix: Groundwater MW80R Sample ID: Date Received: 05/04/2022 08:10 MVTL Field Service Collector:

Temp @ Receipt (C): 2.3

d. 0M0000 D 0044

Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:32	05/04/2022 15:32	RAA		
Alkalinity, Total	540	mg/L as CaCO3	20.5	1	05/04/2022 15:32	05/04/2022 15:32	RAA	MA,NDA	
Bicarbonate	540	mg/L as CaCO3	20.5	1	05/04/2022 15:32	05/04/2022 15:32	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:32	05/04/2022 15:32	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 15:32	05/04/2022 15:32	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3320	mg/L as CaCO3	6.62	1	06/29/2022 09:47	06/29/2022 09:47	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	5684	umhos/cm	1	1	05/04/2022 15:32	05/04/2022 15:32	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.5	units	0.1	1	05/04/2022 15:32	05/04/2022 15:32	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	162	mg/L	2	1	05/09/2022 09:13	05/09/2022 09:13	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.21	mg/L	0.1	1	05/04/2022 15:32	05/04/2022 15:32	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	4.67		0.17	1	06/29/2022 09:47	06/29/2022 09:47	CW		

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908006 **Date Collected:** 05/02/2022 09:00 Matrix: Groundwater Sample ID: Date Received: 05/04/2022 08:10 MVTL Field Service Dup 1 Collector:

Results	Units	RDL	DF	•	Analyzed	Ву	Cert	Qual
9688	umhos/cm	1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
6.94	units	0.01	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
7.47	degrees C		1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
6190	mg/L	250	50	05/05/2022 12:34	05/05/2022 12:34	EJV	MA,NDA	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
3	NTU	0.1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA	
Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
3.70	mg/L	1	5	05/05/2022 09:11	05/05/2022 09:11	EJV	MA,NDA	*
Results	Units	RDL	DF	Prepared	Analyzed 05/05/2022	Ву	Cert	Qual
	Results 6.94 Results 7.47 Results 6190 Results 3 Results <0.0002	Results Units Results Units Results Units 7.47 degrees C Results Units 6190 mg/L Results Units 3 NTU Results Units Vnits Units Units The property of the property	9688 umhos/cm 1 Results Units RDL 6.94 units 0.01 Results Units RDL 7.47 degrees C RDL 6190 mg/L 250 Results Units RDL 3 NTU 0.1 Results Units RDL <0.0002 mg/L 0.0002 Results Units RDL Results Units RDL	9688 umhos/cm 1 1 Results Units RDL DF 6.94 Units RDL DF 7.47 degrees C 1 Results Units RDL DF 6190 mg/L 250 50 Results Units RDL DF 3 NTU 0.1 1 Results Units RDL DF <0.0002 mg/L 0.0002 1 Results Units RDL DF	9688 umhos/cm 1 1 05/02/2022 09:00 Results Units RDL DF Prepared 05/02/2022 09:00 Results Units RDL DF Prepared 05/02/2022 09:00 7.47 degrees C 1 05/02/2022 09:00 Results Units RDL DF Prepared 05/05/2022 12:34 Results Units RDL DF Prepared 05/02/2022 09:00 Results Units RDL DF Prepared 05/05/2022 09:00 Results Units RDL DF Prepared 05/05/2022 08:00 Results Units RDL DF Prepared 05/05/2022 08:00	9688 umhos/cm 1 1 05/02/2022 09:00 05/02/2022 09:00 Results Units RDL DF Prepared Prepared 09:00 Analyzed 05/02/2022 09:00 6.94 units 0.01 1 05/02/2022 09:00 05/02/2022 09:00 Results Units RDL DF Prepared P	9688 umhos/cm 1 1 05/02/2022 09:00 05/02/2022 09:00 JSM Results Units RDL DF Prepared Prepared 09:00 Analyzed 99:00 By 6.94 units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared Prepared 09:00 Analyzed 12:34 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF Prepared 09:00 Analyzed 09:00 By Results Units RDL DF <	Results

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908006
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: EPA 6010D

Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	0.64	mg/L	0.5	5	05/05/2022 08:53	05/11/2022 13:51	SLZ	MA,NDA	
Calcium	396	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:10	MDE	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	05/05/2022 08:53	05/05/2022 13:09	SLZ	MA,NDA	
Magnesium	623	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:10	MDE	MA,NDA	
Manganese, Dissolved	<0.25	mg/L	0.25	5	05/05/2022 08:53	05/05/2022 13:09	SLZ	MA,NDA	
Potassium	29.7	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:10	MDE	MA,NDA	
Sodium	1940	mg/L	5	5	05/05/2022 08:13	05/10/2022 10:10	MDE	MA,NDA	
Method: EPA 6020B									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	
Barium, Dissolved	0.0077	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	06/29/2022 13:34	MDE	MA,NDA	
Molybdenum, Dissolved	0.0023	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	
Selenium, Dissolved	0.0234	mg/L	0.005	5	05/05/2022 08:53	06/16/2022 13:41	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:51	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	142	meq/L		1	06/30/2022 07:49	06/30/2022 07:49	CW		
Cation Summation	156	meq/L		1	06/30/2022 07:49	06/30/2022 07:49	CW		
Percent Difference	4.71	%		1	06/30/2022 07:49	06/30/2022 07:49	CW		
TDS - Summation	9580	mg/L	12.5	1	06/30/2022 07:49	06/30/2022 07:49	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 908006
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Method: SM2320 B-2011

Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 16:06	05/04/2022 16:06	RAA		
Alkalinity, Total	526	mg/L as CaCO3	20.5	1	05/04/2022 16:06	05/04/2022 16:06	RAA	MA,NDA	
Bicarbonate	526	mg/L as CaCO3	20.5	1	05/04/2022 16:06	05/04/2022 16:06	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 16:06	05/04/2022 16:06	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 16:06	05/04/2022 16:06	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3550	mg/L as CaCO3	6.62	1	06/30/2022 07:49	06/30/2022 07:49	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	9848	umhos/cm	1	1	05/04/2022 16:06	05/04/2022 16:06	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.3	units	0.1	1	05/04/2022 16:06	05/04/2022 16:06	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	79.1	mg/L	2	1	05/09/2022 09:14	05/09/2022 09:14	SRD	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.77	mg/L	0.1	1	05/04/2022 16:06	05/04/2022 16:06	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	14.1		0.17	1	06/30/2022 07:49	06/30/2022 07:49	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:908007Date Collected:05/03/2022 12:50Matrix:GroundwaterSample ID:Field BlankDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: ASTM D516-11

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	<5	mg/L	5	1	05/05/2022 12:23	05/05/2022 12:23	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	05/05/2022 08:00	05/05/2022 08:00	MDE	MA,NDA	

Method: EPA 353.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	05/05/2022 09:12	05/05/2022 09:12	EJV	MA,NDA	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Phosphorus as P	<0.2	mg/L	0.2	1	05/05/2022 11:00	05/05/2022 14:49	SRD	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.1	mg/L	0.1	1	05/05/2022 08:53	05/11/2022 13:53	SLZ	MA,NDA	
Calcium	<1	mg/L	1	1	05/05/2022 08:13	05/10/2022 10:12	MDE	MA,NDA	
Iron, Dissolved	<0.1	mg/L	0.1	1	05/05/2022 08:53	05/05/2022 13:11	SLZ	MA,NDA	
Magnesium	<1	mg/L	1	1	05/05/2022 08:13	05/10/2022 10:12	MDE	MA,NDA	
Manganese, Dissolved	<0.05	mg/L	0.05	1	05/05/2022 08:53	05/05/2022 13:11	SLZ	MA,NDA	
Potassium	<1	mg/L	1	1	05/05/2022 08:13	05/10/2022 10:12	MDE	MA,NDA	
Sodium	<1	mg/L	1	1	05/05/2022 08:13	05/10/2022 10:12	MDE	MA,NDA	

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 908007 **Date Collected:** 05/03/2022 12:50 Matrix: Groundwater Field Blank Sample ID: Date Received: 05/04/2022 08:10 MVTL Field Service Collector:

Temp @ Receipt (C): Received on Ice: 2.3 Yes

Method: EPA 6020B									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Barium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Selenium, Dissolved	<0.005	mg/L	0.005	5	05/05/2022 08:53	06/16/2022 12:19	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	05/05/2022 08:53	05/18/2022 15:54	MDE	MA,NDA	
Method: SM1030F									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
TDS - Summation	<12.5	mg/L	12.5	1	06/29/2022 09:50	06/29/2022 09:50	CW		
Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA		

Method:	SM2320	R-2011
welliou.	31112320	D-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA		
Alkalinity, Total	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA	MA,NDA	
Bicarbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	05/04/2022 13:13	05/04/2022 13:13	RAA		
Method: SM2340B-2011									

_			

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	<6.62	mg/L as CaCO3	6.62	1	06/29/2022 09:50	06/29/2022 09·50	CW	MA,NDA	

Method: SM2510 B-2011 EC

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	2	umhos/cm	1	1	05/05/2022 11:33	05/05/2022 11:33	RAA	MA,NDA	

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Qual

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:908007Date Collected:05/03/2022 12:50Matrix:GroundwaterSample ID:Field BlankDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Method: SM4500 H+ B-2011

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.0	units	0.1	1	05/04/2022 13:13	05/04/2022 13:13	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

Chloride <2 mg/L 2 1 05/09/2022 05/09/2022 SRD MA,NDA

Parameter Results Units **RDL** DF Analyzed **Prepared** Ву Cert 05/04/2022 05/04/2022 <0.1 Fluoride 0.1 1 RAA mg/L 13:13 13:13

Method: USDA 20b **Parameter** Results Units **RDL** DF Prepared Analyzed Cert Qual Ву 06/29/2022 06/29/2022 Sodium Adsorption Ratio < 0.17 0.17 1 CW

09:50

09:50

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Account #:

2800

Client: Montana-Dakota Utilities - Bismarck



MINNESOTA VALLEY TESTING LABORATORIES, INC.

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May 6, 2022

Montana-Dakota Utilities **Todd Peterson** 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From May 2-3, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 5 wells. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	/TL Minneso 2616 E. Bi Bismarck, (701) 258-3	orie	es			Montana - Dakota Utilities - B WO: 908					Chain of Custod Record						
Report To: Attn:	MDU		CC:								Project Name: MDU Heskett						
Address:	Todd Peterson 400 N. 4th St Bismarck, ND 58501											Event:			Spring 2022		
Phone: Email:	701-425-2427 Todd.Peterson@mdu.c	com										Sampled I		cremy	Mayer		
	Sam	ple Information	n				Sai	nple Cor	ntainers			Field Re	adings				
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	E	500 mL HNO3 (filtered)	250 mL H2504			Temp (°C)	Spec. Cond.	Hd	Turbidity (NTU)	Analysis Required		
001	MW13	2 May 22	6900	GW	X	X	X	x			7.47	9688	6.94	3.00			
002	MW1-90	3 May 22	1345	GW	X	X	х	x			6.77	7558	6,85	0.12			
	MW2-90	3 May 22	1150	GW	X	X	X	X			7.84	7294	6.94	0.20			
003				GW	X	X	Х	X	100		6.03	4775	6.91	0.64	MDU Heskett List		
	MW3-90	3 Marzz	0918	GVV	10	1 "	1 "										
003 004 005	MW3-90 MW80R	3 May 22	1257	GW	X	X	X	x			8.30	4784	6.93	0.24	MD0 Heskett List		
004		lance		-	-	x	-	_				4784 9688	6.93	3,00	MIDO HESKETT LIST		

Sample Condition

Temp (°C)

TM562 / TM805

Location, Log In Walk In #2

Date/Time

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Received By

Name

Date/Time

4Naya

Report Date: Thursday, June 30, 2022 8:25:26 AM

Relinquished By

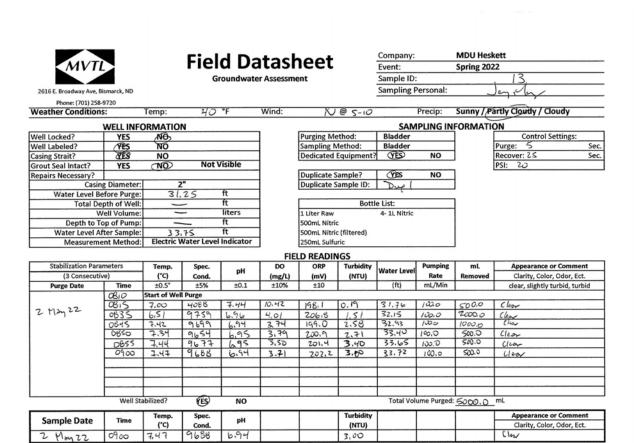


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Comments:



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Control Settings:

Appearance or Comment

Clarity, Color, Odor, Ect.

clear, slightly turbid, turbid

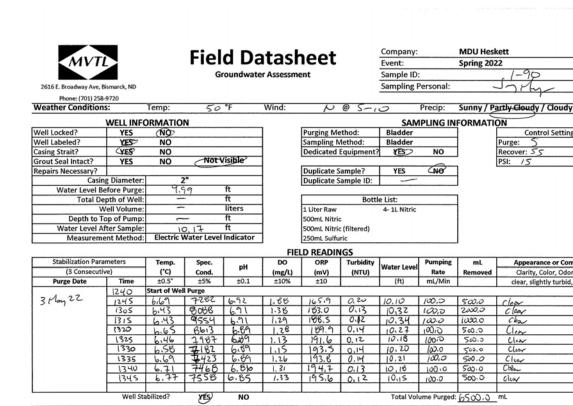
Appearance or Comment

Clarity, Color, Odor, Ect.

Cka

Close

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Turbidity

(NTU)

0,12

Thursday, June 30, 2022 8:25:26 AM Report Date:

Sample Date

3 May 22

Comments:

(°C)

6.77

1345

Collected

Cond

7558

Fuld Blank I @ 1250

6.85



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



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Phone: (701) 258-9720

Measurement Method:

Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2022

 Sample ID:
 2-90

 Sampling Personal:
 June 100

Sunny / Partly Cloudy / Cloudy

Purge:

Control Settings:

Sec.

Weather Conditions: Temp: WELL INFORMATION Well Locked? YES 440 Well Labeled? NO Casing Strait? YES NO Not Visible Grout Seal Intact? YES NO Repairs Necessary? Casing Diameter: Water Level Before Purge: Total Depth of Well: Well Volume liters Depth to Top of Pump: ft Water Level After Sample:

Electric Water Level Indicator

SAMPLING INFORMATION

Purging Method: Bladder
Sampling Method: Bladder
Dedicated Equipment? YES NO

PSI

Precip:

Duplicate Sample P YES NO Duplicate Sample ID:

Bottle List:

1 Liter Raw 4- 1L Nitric

500mL Nitric

500mL Nitric (filtered)

250mL Sulfuric

FIELD READINGS

Stabilization Para	ameters	Temp.	Spec.	pH	1 00	OKP	Turbiaity	Water Level	Pumping	mL.	Appearance or Comment
(3 Consecuti	ive)	(°C)	Cond.	PΠ	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	(050	Start of Wel	l Purge								
3 My 22	1055	7.31	7500	7.01	5.00	210.1	0.86	21.61	10.0	500.0	Class
7	1115	7.77	7020	6,95	3.65	202.3	0,15	21.67	120.0	2000.0	Clear
	1125	7.72	6654	6.96	3.95	182.0	0.29	21.90	100.0	1000.0	Clear
1	1130	7.68	6516	6.96	4.01	176.0	0.16	21,91	100.0	50.0	Clear
	1135	7.69	6338	6.96	3,75	1707	0,13	21.92	1000	500.0	Clear
	1140	7.79	6987	6,95	3.98	170.3	0.15	21,93	180.0	500.0	Clear
	1145	7.B1	7118	6.94	4.01	170.6	0,17	21.94	100:00	5000	Clear
1	1150	7.84	7294	6.94	4.12	170.9	0,20	21.94	100.0	500,0	Cla
										L .	
	Well St	abilized?	(YES)	NO				Total Vol	ume Purged:	500.0	mL

Sample Date	Time	Temp.	Spec.	pН	Turbidity	1	Appearance or Comment
		(-c)	Cond.		(NTU)		Clarity, Color, Odor, Ect.
3 May 22	1150	7.84	7294	6,94	0.20		Clear

Comments:

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

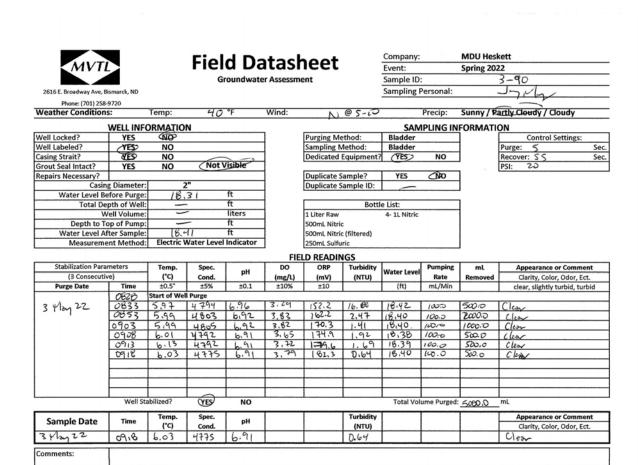


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 Spring 2022

 Sample ID:
 COR

 Sampling Personal:
 COR

Precip: Sunny Partly Cloudy / Cloudy

Purge:

weather Conditions	5:	remp:	501	wina:
	WELL INFO	DRMATION		
Well Locked?	YES	NO.		P
Well Labeled?	YES	NO		Sa
Casing Strait?	(YES	NO		D
Grout Seal Intact?	/YES)	NO	Not Visible	
Repairs Necessary?				D
Casing	g Diameter:	2"		D
Water Level Be	fore Purge:	12.96	ft	7 -
Total Dep	pth of Well:		ft	7 6
W	ell Volume:		liters	1
Depth to To	p of Pump:		ft	50
Water Level Af	ter Sample:	13,40	ft	50
Measureme	nt Method:	Electric Wate	r Level Indicator	- 21

	SAM	PLING IN	NFORMAT	ION
Purging Method:	Bladder		7	
Sampling Method:	Bladder		7	Pur
Dedicated Equipment?	(YES)	NO	7	Rec
•			_	DCI-

N@ 5~10

Duplicate Sample ID:

Bottle List:									
1 Liter Raw	4- 1L Nitric								
500mL Nitric									
500mL Nitric (filtered	d)								
250mL Sulfuric									

FIEI	.D	REA	IID	NGS

Stabilization Para	meters	Temp.	p. Spec. pH DO ORP Turbidity Water Level Pumping mL Appearance or C		Appearance or Comment						
(3 Consecutiv	ve)	(°C)	Cond.	, pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	1157	Start of Wel	l Purge								
2 May 22	1202	7.34	5364	6.96	0.97	207.2	0,30	13, 13	9000	50.0	Clean
2 1 00	1232 8		4977	6.95	1.21	202.7	0.29	13.21	100,0	2000,0	Clear
1	1242		4918	6.94	1,1/	201.9	0,19	13,24	100.0	1000,0	Clear
1	1247	B.24	4678	6,93	i.06	200.3	0.26	13.32			Clear
	1252	8.21	4621	6.93	0.95	198.6	0.27	13.33	100.0	500.0	Clear
1	1257	8.30	4784	6.93	0.89	198,1	0.24	13,34	100.0	500.0	clear
1											
	Well Stabilized? (FES) NO Total Volume Purged: 5000 mL										

			_												
Cample Date	Time	Temp.	Spec.	pH		Turbidity	Turbidity		Turbidity		Turbidity				Appearance or Comment
Sample Date	Time	(°C)	Cond.			(NTU)				Clarity, Color, Odor, Ect.					
2 May 22	1257	8.30	4784	6.93		0,24				Char					

Comments:

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL	
2616 E. Broadway Ave, Bismarck	k, N

Field Datasheet

Surface water Assessment

Company: MDU Lewis & Clark
Event: Spring 2022

Sampling Personal:

Weather Conditions	Temp:	45	°F	Wind:	<i>N</i>	@ 5-10	Precip: Sunny / Partly Cloudy / Cloud				
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Comments					
MW70		1130	2"	21.78							
MW33		1150	2"	42.76							
MW101		1132	2"	37.94							
MW102	2 May 22	1128	2"	19,50							
MW103		1140	2"	36,74							
MW44R		1137	2"	27.14							
MW104		1147	2"	14.18							
MW105		1154	2"	11.78							

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Original Sample QC Type	Analyte	Analysis Date	QC Result	Original Sam	ple Re Units	Spike Amou S	pike Resu Spi	ke % RecoveSpil	ke Duplicate Spik	e Duplicate RP	D (%) Lower (Control Limi Upper (Control Limit RPD L	Limit (%)
908001 MS	Alkalinity, Total	05/04/2022 13:55:25	95.15	527	mg/L	410	917	95.15				80	120	
908001 MSD	Alkalinity, Total	05/04/2022 14:07:30	91.68	527	mg/L				903	91.68	1.54	80	120	20
CRM	Alkalinity, Total	05/04/2022 10:43:59	94.62		mg/L	501	474	94.62				80	120	
LFB	Alkalinity, Total	05/04/2022 10:33:10	94.28		mg/L	410	386	94.28				90	110	
LFB	Alkalinity, Total	05/04/2022 16:32:14	95.21		mg/L	410	390	95.21				90	110	
MB	Alkalinity, Total	05/04/2022 16:26:10	<20.5		mg/L as CaCO3									
MB	Alkalinity, Total	05/04/2022 10:17:15	<20.5		mg/L as CaCO3									
908006 SPK	Arsenic, Dissolved	06/29/2022 12:11:00	117	<0.002	mg/L	0.1	0.1168	117				75	125	
908006 SPKD	Arsenic, Dissolved	06/29/2022 12:11:00	117	<0.002	mg/L				0.1174	117	0.51	75	125	20
908007 SPK	Arsenic, Dissolved	05/18/2022 16:17:00	113	<0.002	mg/L	0.1	0.1127	113				75	125	
908007 SPKD	Arsenic, Dissolved	05/18/2022 16:20:00	115	<0.002	mg/L				0.1148	115	1.85	75	125	20
925001 SPK	Arsenic, Dissolved	05/19/2022 12:55:34	101		mg/L	0.1	0.1077	101				75	125	
927004 SPK	Arsenic, Dissolved	05/19/2022 13:50:30	106		mg/L	0.1	0.1059	106				75	125	
1373003 SPK	Arsenic, Dissolved	06/29/2022 13:56:00	118	<0.002	mg/L	0.1	0.1176	118				75	125	
1373003 SPKD	Arsenic, Dissolved	06/29/2022 14:00:00	117	<0.002	mg/L				0.1174	117	0.17	75	125	20
LFB-MS	Arsenic, Dissolved	05/19/2022 11:55:00	97		ug/L	100	97	97				80	120	
LFB-MS	Arsenic, Dissolved	05/20/2022 15:03:01	102.3		ug/L	100	102	102.3				85	115	
LFB-MS	Arsenic, Dissolved	05/19/2022 14:11:00	98.4		ug/L	100	98.4	98.4				80	120	
MB	Arsenic, Dissolved	05/19/2022 11:29:00	<2.00		ug/L									
MB	Arsenic, Dissolved	05/20/2022 15:00:02	<2.00		ug/L									
MB	Arsenic, Dissolved	05/19/2022 12:43:00	<2.00		ug/L									
908001 MS	Barium, Dissolved	05/19/2022 12:05:00	93.9	7.7	ug/L	400	386	93.9				75	125	
908001 MSD	Barium, Dissolved	05/19/2022 12:08:00	93.4	7.7	ug/L				384	93.4	0.50	75	125	20
908006 SPK	Barium, Dissolved	06/29/2022 12:11:00	99.6	0.0077	mg/L	0.1	0.1073	99.6				75	125	
908006 SPKD	Barium, Dissolved	06/29/2022 12:11:00	99	0.0077	mg/L				0.1067	99	0.56	75	125	20
908007 SPK	Barium, Dissolved	05/18/2022 16:17:00	103	<0.002	mg/L	0.1	0.103	103				75	125	
908007 SPKD	Barium, Dissolved	05/18/2022 16:20:00	104	<0.002	mg/L				0.1037	104	0.68	75	125	20
925001 SPK	Barium, Dissolved	05/19/2022 12:55:34	93.2		mg/L	0.1	0.1957	93.2				75	125	
927004 SPK	Barium, Dissolved	05/19/2022 13:50:30	93.4		mg/L	0.1	0.1066	93.4				75	125	
1373003 SPK	Barium, Dissolved	06/29/2022 13:56:00	101	<0.1	mg/L	0.1	0.1705	101				75	125	
1373003 SPKD	Barium, Dissolved	06/29/2022 14:00:00	103	<0.1	mg/L				0.1725	103	1.17	75	125	20
LFB-MS	Barium, Dissolved	05/19/2022 11:55:00	97.3		ug/L	100	97.3	97.3				80	120	
LFB-MS	Barium, Dissolved	05/20/2022 15:03:01	106.6		ug/L	100	106	106.6				85	115	
LFB-MS	Barium, Dissolved	05/19/2022 14:11:00	97.2		ug/L	100	97.2	97.2				80	120	
MB	Barium, Dissolved	05/20/2022 15:00:02	<2.00		ug/L									
MB	Barium, Dissolved	05/19/2022 12:43:00	<2.00		ug/L									
MB	Barium, Dissolved	05/19/2022 11:29:00	<2.00		ug/L									
908001 PDS	Boron, Dissolved	05/11/2022 13:19:00		0.64	mg/L									
908001 PDSD	Boron, Dissolved	05/11/2022 13:21:00		0.64	mg/L						3.34			20
908003 SPK	Boron, Dissolved	05/11/2022 13:44:00	110	<0.5	mg/L	2	2.207	110				75	125	
908003 SPKD	Boron, Dissolved	05/11/2022 13:46:00	115	<0.5	mg/L				2.294	115	3.87	75	125	20
LFB-OE	Boron, Dissolved	05/11/2022 13:16:13	99		mg/L	0.4	0.3959	99				85	115	
MB	Boron, Dissolved	05/11/2022 13:14:17	<0.1		mg/L									
908001 MS	Cadmium, Dissolved	05/19/2022 12:05:00	99.2	<0.5	ug/L	400	397	99.2				75	125	
908001 MSD	Cadmium, Dissolved	05/19/2022 12:08:00	100.4	<0.5	ug/L				401	100.4	1.00	75	125	20
908006 SPK	Cadmium, Dissolved	06/29/2022 12:11:00	102	<0.0005	mg/L	0.1	0.1019	102				75	125	
908006 SPKD	Cadmium, Dissolved	06/29/2022 12:11:00	104	<0.0005	mg/L				0.1044	104	2.42	75	125	20
908007 SPK	Cadmium, Dissolved	05/18/2022 16:17:00	118	< 0.0005	mg/L	0.1	0.118	118				75	125	

908007 SPKD	Cadmium, Dissolved	05/18/2022 16:20:00	116	<0.0005	mg/L				0.1156	116	2.05	75	125	20
925001 SPK	Cadmium, Dissolved	05/19/2022 12:55:34	97.9		mg/L	0.1	0.0979	97.9				75	125	
927004 SPK	Cadmium, Dissolved	05/19/2022 13:50:30	93.2		mg/L	0.1	0.0937	93.2				75	125	
1373003 SPK	Cadmium, Dissolved	06/29/2022 13:56:00	115	<0.0005	mg/L	0.1	0.1146	115				75	125	
1373003 SPKD	Cadmium, Dissolved	06/29/2022 14:00:00	114	<0.0005	mg/L				0.1136	114	0.88	75	125	20
LFB-MS	Cadmium, Dissolved	05/19/2022 11:55:00	100.6		ug/L	100	101	100.6				80	120	
LFB-MS	Cadmium, Dissolved	05/20/2022 15:03:01	108.3		ug/L	100	108	108.3				85	115	
LFB-MS	Cadmium, Dissolved	05/19/2022 14:11:00	105.3		ug/L	100	105	105.3				80	120	
MB	Cadmium, Dissolved	05/19/2022 12:43:00	<0.500		ug/L									
MB	Cadmium, Dissolved	05/19/2022 11:29:00	<0.500		ug/L									
MB	Cadmium, Dissolved	05/20/2022 15:00:02	<0.500		ug/L									
905001 DUP	Calcium	05/10/2022 09:54:21	131.5		mg/L						3.80			20
908001 PDS	Calcium	05/10/2022 09:58:00	94.4	401	mg/L	400	778.7	94.4				75	125	
908001 PDSD	Calcium	05/10/2022 10:00:00	94.6	401	mg/L				779.2	94.6	0.06	75	125	20
926001 DUP	Calcium	05/10/2022 10:33:07	351.8	354	mg/L						0.62			20
926002 PDS	Calcium	05/10/2022 10:37:00	96.1	447	mg/L	400	831.4	96.1				75	125	
926002 PDSD	Calcium	05/10/2022 10:39:00	94.1	447	mg/L				823.4	94.1	0.97	75	125	20
927004 PDS	Calcium	05/10/2022 11:02:00	101	716	mg/L	400	1012	101				75	125	
927004 PDSD	Calcium	05/10/2022 11:04:00	99.7	716	mg/L				1006	99.7	0.60	75	125	20
LFB-MI	Calcium	05/10/2022 10:24:55	106		mg/L	100	105.5	106				85	115	
LFB-MI	Calcium	05/10/2022 09:50:19	107		mg/L	100	107.3	107				85	115	
MB	Calcium	05/10/2022 09:47:00			mg/L									
MB	Calcium	05/10/2022 10:22:17			mg/L									
908004 MS	Chloride	05/09/2022 09:16:17		36.5	mg/L	30	70.2	112				80	120	
908004 MSD	Chloride	05/09/2022 09:17:28	109	36.5	mg/L				69.3	109	1.29	80	120	20
LFB	Chloride	05/09/2022 09:19:49	92.8		mg/L	30	27.8	92.8				90	110	
LFB	Chloride	05/09/2022 10:22:07	92.5		mg/L	30	27.7	92.5				90	110	
LFB	Chloride	05/09/2022 08:55:56	93.3		mg/L	30	28	93.3				90	110	
MB	Chloride	05/09/2022 10:20:56	<2.00		mg/L	00	20	00.0				00	110	
MB	Chloride	05/09/2022 09:18:39	<2.00		mg/L									
MB	Chloride	05/09/2022 08:54:45	<2.00		mg/L									
908006 SPK	Chromium, Dissolved	06/29/2022 12:11:00	107	<0.002	mg/L	0.1	0.1073	107				75	125	
908006 SPKD	Chromium, Dissolved	06/29/2022 12:11:00		<0.002	mg/L	0.1	0.1073	107	0.1097	110	2.21	75	125	20
908000 SFKD 908007 SPK	Chromium, Dissolved	05/18/2022 16:17:00		<0.002		0.1	0.0977	97.7	0.1097	110	2.21	75 75	125	20
908007 SPKD	Chromium, Dissolved	05/18/2022 16:17:00		<0.002	mg/L	0.1	0.0977	91.1	0.0988	98.8	1.12		125	20
925001 SPK	Chromium, Dissolved	05/19/2022 12:55:34		<0.002	mg/L	0.1	0.1094	105	0.0966	90.0	1.12	75 75	125	20
927004 SPK	Chromium, Dissolved	05/19/2022 12:50:30			mg/L		0.1094	111					125	
				-0.003	mg/L	0.1						75 75		
1373003 SPK	Chromium, Dissolved	06/29/2022 13:56:00		<0.002	mg/L	0.1	0.1027	103	0.4024	103	0.68	75 75	125	20
1373003 SPKD	Chromium, Dissolved		103	<0.002	mg/L	100	400	400	0.1034	103	0.00	75	125	20
LFB-MS	Chromium, Dissolved				ug/L	100	102	102				80	120	
LFB-MS	Chromium, Dissolved	05/19/2022 11:55:00			ug/L	100	98.8	98.8				80	120	
LFB-MS	Chromium, Dissolved	05/20/2022 15:03:01	107.5		ug/L	100	107	107.5				85	115	
MB	Chromium, Dissolved	05/20/2022 15:00:02	<2.00		ug/L									
MB	Chromium, Dissolved	05/19/2022 11:29:00	<2.00		ug/L									
MB	Chromium, Dissolved	05/19/2022 12:43:00	<2.00		ug/L							<u>-</u> -		
908002 MS-F	Fluoride	05/04/2022 14:32:14		1.12	mg/L	0.5	1.59	94	. =-	. .		80	120	- -
908002 MSD-F	Fluoride	05/04/2022 14:38:10		1.12	mg/L		_		1.59	94	0.00	80	120	20
CRM-F	Fluoride	05/04/2022 11:24:00			mg/L	3.3	3.4	103				83.92	111.19	
LFB-F	Fluoride	05/04/2022 17:01:32	100		mg/L	0.5	0.5	100				90	110	

LFB-F	Fluoride	05/04/2022 11:36:53	100		mg/L	0.5	0.5	100				90	110	
MB-F	Fluoride	05/04/2022 11:30:26	<0.1		mg/L									
MB-F	Fluoride	05/04/2022 16:55:11	<0.1		mg/L									
823001 SPK	Iron, Dissolved	05/05/2022 12:52:00	83.3	6.69	mg/L	2	8.355	83.3				75	125	
823001 SPKD	Iron, Dissolved	05/05/2022 12:55:00	81.7	6.69	mg/L				8.323	81.7	0.38	75	125	20
LFB-OE	Iron, Dissolved	05/05/2022 11:51:38	105		mg/L	0.4	0.4191	105				85	115	
LFB-OE	Iron, Dissolved	05/05/2022 11:06:51	105		mg/L	0.4	0.4189	105				85	115	
MB	Iron, Dissolved	05/05/2022 11:49:22	<0.1		mg/L									
MB	Iron, Dissolved	05/05/2022 11:04:35	<0.1		mg/L									
908001 MS	Lead, Dissolved	05/19/2022 12:05:00	92.1	<0.5	ug/L	400	368	92.1				75	125	
908001 MSD	Lead, Dissolved	05/19/2022 12:08:00	92.6	<0.5	ug/L				370	92.6	0.50	75	125	20
908006 SPK	Lead, Dissolved	06/29/2022 12:11:00	91.9	<0.0005	mg/L	0.1	0.0919	91.9				75	125	
908006 SPKD	Lead, Dissolved	06/29/2022 12:11:00	92.5	<0.0005	mg/L				0.0925	92.5	0.65	75	125	20
908007 SPK	Lead, Dissolved	05/18/2022 16:17:00	103	<0.0005	mg/L	0.1	0.103	103				75	125	
908007 SPKD	Lead, Dissolved	05/18/2022 16:20:00	104	<0.0005	mg/L				0.1039	104	0.87	75	125	20
925001 SPK	Lead, Dissolved	05/19/2022 12:55:34	90.8		mg/L	0.1	0.0929	90.8				75	125	
927004 SPK	Lead, Dissolved	05/19/2022 13:50:30	88.4		mg/L	0.1	0.0884	88.4				75	125	
1373003 SPK	Lead, Dissolved	06/29/2022 13:56:00	99.1		mg/L	0.1	0.0991	99.1				75	125	
1373003 SPKD	Lead, Dissolved	06/29/2022 14:00:00	99.6		mg/L				0.0996	99.6	0.50	75	125	20
LFB-MS	Lead, Dissolved	05/20/2022 15:03:01	106.2		ug/L	100	106	106.2				85	115	
LFB-MS	Lead, Dissolved	05/19/2022 11:55:00	96.4		ug/L	100	96.4	96.4				80	120	
LFB-MS	Lead, Dissolved	05/19/2022 14:11:00	100.7		ug/L	100	101	100.7				80	120	
MB	Lead, Dissolved	05/20/2022 15:00:02	<0.500		ug/L									
MB	Lead, Dissolved	05/19/2022 11:29:00	<0.500		ug/L									
MB	Lead, Dissolved	05/19/2022 12:43:00	< 0.500		ug/L									
905001 DUP	Magnesium	05/10/2022 09:54:21	58.59	59.2	mg/L						1.04			20
908001 PDS	Magnesium	05/10/2022 09:58:00	94.2	631	mg/L	400	1008	94.2				75	125	
908001 PDSD	Magnesium	05/10/2022 10:00:00	92.1	631	mg/L				999.6	92.1	0.84	75	125	20
926001 DUP	Magnesium	05/10/2022 10:33:07	193.1	194	mg/L						0.47			20
926002 PDS	Magnesium	05/10/2022 10:37:00	98.5	368	mg/L	400	761.6	98.5				75	125	
926002 PDSD	Magnesium	05/10/2022 10:39:00	97.8	368	mg/L				758.7	97.8	0.38	75	125	20
927004 PDS	Magnesium	05/10/2022 11:02:00	95.4	561	mg/L	400	825	95.4				75	125	
927004 PDSD	Magnesium	05/10/2022 11:04:00	96.9	561	mg/L				831.1	96.9	0.74	75	125	20
LFB-MI	Magnesium	05/10/2022 09:50:19	109		mg/L	100	109.4	109				85	115	
LFB-MI	Magnesium	05/10/2022 10:24:55	106		mg/L	100	106.4	106				85	115	
MB	Magnesium	05/10/2022 09:47:00	<1		mg/L									
MB	Magnesium	05/10/2022 10:22:17	<1		mg/L									
823001 SPK	Manganese, Dissolved	05/05/2022 12:52:00	93.4	0.71	mg/L	2	2.58	93.4				75	125	
823001 SPKD	Manganese, Dissolved	05/05/2022 12:55:00	94	0.71	mg/L				2.591	94	0.43	75	125	20
LFB-OE	Manganese, Dissolved	05/05/2022 11:51:38	105		mg/L	0.4	0.4201	105				85	115	
LFB-OE	Manganese, Dissolved	05/05/2022 11:06:51	105		mg/L	0.4	0.4219	105				85	115	
MB	Manganese, Dissolved	05/05/2022 11:04:35	<0.05		mg/L									
MB	Manganese, Dissolved	05/05/2022 11:49:22	<0.05		mg/L									
908007 MS	Mercury, Dissolved	05/05/2022 08:00:00	99.2	<0.2	ug/L	2	1.984	99.2				70	130	
908007 MSD	Mercury, Dissolved	05/05/2022 08:00:00	97.1	<0.2	ug/L				1.942	97.1	2.14	70	130	20
LFB	Mercury, Dissolved		102		ug/L	2	2.037	102				85	115	
LFB	Mercury, Dissolved	05/05/2022 08:00:00	98.4		ug/L	2	1.968	98.4				85	115	
LRB	Mercury, Dissolved	05/05/2022 08:00:00	<0.2		ug/L									
LRB	Mercury, Dissolved	05/05/2022 08:00:00	<0.2		ug/L									
					-									

908006 SPK	Molybdenum, Dissolved	06/29/2022 12:11:00	118	0.0023	mg/L	0.1	0.1205	118				75	125	
908006 SPKD	Molybdenum, Dissolved	06/29/2022 12:11:00	121	0.0023	mg/L				0.1229	121	1.97	75	125	20
908007 SPK	Molybdenum, Dissolved	06/16/2022 12:22:00	99.4	<0.002	mg/L	0.02	0.0199	99.4				75	125	
908007 SPK	Molybdenum, Dissolved		116	<0.002	mg/L	0.1	0.1163	116				75	125	
908007 SPKD	Molybdenum, Dissolved	06/16/2022 12:25:00	101	<0.002	mg/L				0.0202	101	1.50	75	125	20
908007 SPKD	Molybdenum, Dissolved	05/18/2022 16:20:00	116	<0.002	mg/L				0.1161	116	0.17	75	125	20
925001 SPK	Molybdenum, Dissolved	05/19/2022 12:55:34	110		mg/L	0.1	0.1194	110				75	125	
927004 SPK	Molybdenum, Dissolved	05/19/2022 13:50:30	113		mg/L	0.1	0.1157	113				75	125	
1373003 SPK	Molybdenum, Dissolved	06/29/2022 13:56:00	114	0.0027	mg/L	0.1	0.1169	114				75	125	
1373003 SPKD	Molybdenum, Dissolved	06/29/2022 14:00:00	113	0.0027	mg/L				0.1157	113	1.03	75	125	20
LFB-MS	Molybdenum, Dissolved	05/20/2022 15:03:01	108.4		ug/L	100	108	108.4				85	115	
LFB-MS	Molybdenum, Dissolved	05/19/2022 14:11:00	103.9		ug/L	100	104	103.9				80	120	
LFB-MS	Molybdenum, Dissolved	05/19/2022 11:55:00	99.7		ug/L	100	99.7	99.7				80	120	
MB	Molybdenum, Dissolved	05/19/2022 12:43:00	<2.00		ug/L									
MB	Molybdenum, Dissolved	05/19/2022 11:29:00	<2.00		ug/L									
MB	Molybdenum, Dissolved	05/20/2022 15:00:02	<2.00		ug/L									
819001 MS	Nitrate + Nitrite as N	05/05/2022 08:29:35	104	<0.2	mg/L	1	1.04	104				90	110	
819001 MSD	Nitrate + Nitrite as N	05/05/2022 08:30:41	102	<0.2	mg/L				1.02	102	1.94	90	110	20
851001 MS	Nitrate + Nitrite as N	05/05/2022 08:41:42	102	<0.2	mg/L	1	1.02	102				90	110	
851001 MSD	Nitrate + Nitrite as N	05/05/2022 08:42:49	103	<0.2	mg/L				1.03	103	0.98	90	110	20
892006 MS	Nitrate + Nitrite as N	05/05/2022 09:06:01	96	73.6	mg/L	40	112	96				90	110	
892006 MSD	Nitrate + Nitrite as N	05/05/2022 09:07:08	99	73.6	mg/L				113	99	0.89	90	110	20
908007 MS	Nitrate + Nitrite as N	05/05/2022 09:22:37	104	<0.2	mg/L	1	1.04	104				90	110	
908007 MSD	Nitrate + Nitrite as N	05/05/2022 09:23:44	104	<0.2	mg/L				1.04	104	0.00	90	110	20
927002 MS	Nitrate + Nitrite as N	05/05/2022 09:41:24	108	0.24	mg/L	1	1.32	108				90	110	
927002 MSD	Nitrate + Nitrite as N	05/05/2022 09:42:30	109	0.24	mg/L				1.33	109	0.76	90	110	20
LFB	Nitrate + Nitrite as N	05/05/2022 08:26:16	100		mg/L	0.5	0.5	100				90	110	
LFB	Nitrate + Nitrite as N	05/05/2022 08:45:04	102		mg/L	0.5	0.51	102				90	110	
LFB	Nitrate + Nitrite as N	05/05/2022 09:09:23	102		mg/L	0.5	0.51	102				90	110	
LFB	Nitrate + Nitrite as N	05/05/2022 09:29:16	102		mg/L	0.5	0.51	102				90	110	
LFB	Nitrate + Nitrite as N	05/05/2022 09:45:52	100		mg/L	0.5	0.5	100				90	110	
880001 MS	Phosphorus as P	05/05/2022 14:38:27		3.83	mg/L	1	4.99	116				90	110	
880001 MSD	Phosphorus as P	05/05/2022 14:39:33	113	3.83	mg/L				4.96	113	0.60	90	110	20
913001 MS	Phosphorus as P	05/05/2022 14:55:58	119	<0.2	mg/L	1	1.19	119				90	110	
913001 MSD	Phosphorus as P	05/05/2022 14:57:04		<0.2	mg/L				1.17	117	1.69	90	110	20
LFB	Phosphorus as P	05/05/2022 15:26:27			mg/L	0.5	0.52	104				90	110	
LFB	Phosphorus as P	05/05/2022 14:25:41			mg/L	0.5	0.55	110				90	110	
MB	Phosphorus as P	05/05/2022 14:58:10			mg/L									
MB	Phosphorus as P	05/05/2022 14:22:12			mg/L									
905001 DUP	Potassium	05/10/2022 09:54:21			mg/L						2.22			20
908001 PDS	Potassium	05/10/2022 09:58:00		31.8	mg/L	400	451.2	105				75	125	
908001 PDSD	Potassium	05/10/2022 10:00:00	103	31.8	mg/L				442.5	103	1.95	75	125	20
926001 DUP	Potassium			59.4	mg/L						1.05			20
926002 PDS	Potassium	05/10/2022 10:37:00		361	mg/L	400	752.8	97.9			- -	75	125	
926002 PDSD	Potassium	05/10/2022 10:39:00		361	mg/L		. 02.0	00	750.4	97.3	0.32	75	125	20
927004 PDS	Potassium	05/10/2022 11:02:00		13.7	mg/L	400	410.2	99.5		01.0	3.32	75 75	125	_0
927004 PDSD	Potassium	05/10/2022 11:04:00		13.7	mg/L			22.0	417	101	1.64	75	125	20
LFB-MI	Potassium	05/10/2022 10:24:55			mg/L	100	104	104				85	115	_5
LFB-MI	Potassium	05/10/2022 09:50:19			mg/L	100	108.6	109				85	115	
	· otaootani	00, 10,2022 00.00.19	.00		111g/ L	100	.00.0	100				00	110	

MB	Potassium	05/10/2022 09:47:00	_1		mg/L									
MB	Potassium	05/10/2022 09:47:00			mg/L									
908006 SPK	Selenium, Dissolved	06/29/2022 12:11:00		0.0234	mg/L	0.1	0.1561	133				75	125	
908006 SPKD	Selenium, Dissolved	06/29/2022 12:11:00		0.0234	mg/L	0.1	0.1501	155	0.1528	129	2.14	75 75	125	20
908000 SFKD	Selenium, Dissolved	06/16/2022 12:21:00	102	<0.005	mg/L	0.02	0.0203	102	0.1320	123	2.17	75 75	125	20
908007 SPKD	Selenium, Dissolved		96.4	<0.005	mg/L	0.02	0.0203	102	0.0193	96.4	5.05	75	125	20
925001 SPK	Selenium, Dissolved	05/19/2022 12:55:34	99.7	<0.003	mg/L	0.1	0.0997	99.7	0.0193	30.4	5.05	75 75	125	20
927004 SPK	Selenium, Dissolved	05/19/2022 12:50:30	105		mg/L	0.1	0.0997	105				75 75	125	
1373003 SPK	Selenium, Dissolved	06/29/2022 13:56:00	138	<0.005		0.1	0.1047	138				75 75	125	
1373003 SPKD	Selenium, Dissolved	06/29/2022 14:00:00		<0.005	mg/L	0.1	0.1370	130	0.1375	137	0.07	75 75	125	20
LFB-MS	Selenium, Dissolved	05/19/2022 11:55:00	95	<0.005	mg/L	100	05	95	0.1375	137	0.07	75 80	120	20
LFB-MS	Selenium, Dissolved	05/19/2022 14:11:00	100.2		ug/L	100	95 100	100.2				80	120	
LFB-MS	Selenium, Dissolved	05/20/2022 15:03:01			ug/L	100	108	100.2					115	
MB	Selenium, Dissolved	05/20/2022 15:00:02	108 <5.00		ug/L	100	100	100				85	115	
MB	Selenium, Dissolved	05/20/2022 13:00:02	<5.00 <5.00		ug/L									
MB	Selenium, Dissolved	05/19/2022 11:29:00	<5.00 <5.00		ug/L									
				-O F	ug/L	400	150	20.2				75	105	
908001 MS	Silver, Dissolved	05/19/2022 12:05:00	39.3	<0.5	ug/L	400	158	39.3	150	20 F	0.60	75 75	125	20
908001 MSD	Silver, Dissolved	05/19/2022 12:08:00	39.5	<0.5	ug/L	0.1	0.0000	00.0	159	39.5	0.60	75 75	125	20
908006 SPK	Silver, Dissolved	06/29/2022 12:11:00 06/29/2022 12:11:00	88.3	<0.0005	mg/L	0.1	0.0883	88.3	0.0006	00.6	0.24	75 75	125	20
908006 SPKD	Silver, Dissolved			<0.0005	mg/L	0.4	0.4000	100	0.0886	88.6	0.34	75 75	125	20
908007 SPK	Silver, Dissolved	05/18/2022 16:17:00	109	<0.0005	mg/L	0.1	0.1089	109	0.4000	407	4.05	75 75	125	20
908007 SPKD	Silver, Dissolved	05/18/2022 16:20:00		<0.0005	mg/L	0.4	0.0070	07.0	0.1069	107	1.85	75 75	125	20
925001 SPK	Silver, Dissolved	05/19/2022 12:55:34			mg/L	0.1	0.0972	97.2				75 75	125	
927004 SPK	Silver, Dissolved	05/19/2022 13:50:30	90.1		mg/L	0.1	0.0901	90.1				75 75	125	
1373003 SPK	Silver, Dissolved	06/29/2022 13:56:00			mg/L	0.1	0.0954	95.4	0.0050	05.0	0.04	75 75	125	00
1373003 SPKD	Silver, Dissolved	06/29/2022 14:00:00	95.2		mg/L	400	407	1007	0.0952	95.2	0.21	75	125	20
LFB-MS	Silver, Dissolved	05/20/2022 15:03:01	106.7		ug/L	100	107	106.7				85	115	
LFB-MS	Silver, Dissolved	05/19/2022 14:11:00	104.4		ug/L	100	104	104.4				80	120	
LFB-MS	Silver, Dissolved	05/19/2022 11:55:00	100.9		ug/L	100	101	100.9				80	120	
MB	Silver, Dissolved	05/20/2022 15:00:02	<0.500		ug/L									
MB	Silver, Dissolved	05/19/2022 12:43:00	<0.500		ug/L									
MB	Silver, Dissolved	05/19/2022 11:29:00	<0.500	405	ug/L						0.04			00
905001 DUP	Sodium	05/10/2022 09:54:21	164.0	165	mg/L	4000	0500	00.4			0.61	75	405	20
908001 PDS	Sodium	05/10/2022 11:14:00		1970	mg/L	1600	3506	96.1	0.450	00.4	4.00	75 75	125	00
908001 PDSD	Sodium	05/10/2022 11:16:00	93.1	1970	mg/L				3458	93.1	1.38	75	125	20
926001 DUP	Sodium	05/10/2022 10:33:07	356.0	355	mg/L	400	4007	0.4			0.28	75	405	20
926002 PDS	Sodium	05/10/2022 10:37:00		901	mg/L	400	1237	84	1010	05.5	0.40	75 75	125	00
926002 PDSD	Sodium	05/10/2022 10:39:00		901	mg/L	400	4074	00.5	1243	85.5	0.48	75 75	125	20
927004 PDS	Sodium		88.5	876	mg/L	400	1071	88.5	1007	07.5	0.07	75 75	125	00
927004 PDSD	Sodium		87.5	876	mg/L	400	405	405	1067	87.5	0.37	75	125	20
LFB-MI	Sodium	05/10/2022 10:24:55			mg/L	100	105	105				85	115	
LFB-MI	Sodium	05/10/2022 09:50:19			mg/L	100	109.3	109				85	115	
MB	Sodium	05/10/2022 10:22:17			mg/L									
MB	Sodium	05/10/2022 09:47:00			mg/L									
908003 DUP	Specific Conductance	05/04/2022 15:00:46	7446.0	7454	umhos/cm						0.11			20
908007 DUP	Specific Conductance	05/05/2022 11:33:03	1.9360	2	umhos/cm			465		400	3.25	2-	405	20.
CRM-C	Specific Conductance	05/04/2022 17:41:14			umhos/cm	1409	1410	100		100		95	105	
CRM-C	Specific Conductance	05/05/2022 11:11:00	100		umhos/cm	1409	1413	100		100		95	105	
CRM-C	Specific Conductance	05/05/2022 11:33:03	100		umhos/cm	1409	1413	100		100		95	105	

CRM-C	Specific Conductance	05/04/2022 12:04:45	100		umhos/cm	1409	1403	100		100		95	105	
849004 MS	Sulfate	05/05/2022 11:56:45	64.9	662	mg/L	500	987	64.9				85	115	
849004 MSD	Sulfate	05/05/2022 11:57:51	66.1	662	mg/L				993	66.1	0.61	85	115	20
901007 MS	Sulfate	05/05/2022 12:24:51	92	180	mg/L	1000	1100	92				85	115	
901007 MSD	Sulfate	05/05/2022 12:25:57	92.8	180	mg/L				1110	92.8	0.90	85	115	20
LFB	Sulfate	05/05/2022 12:09:25	91.8		mg/L	100	91.8	91.8				85	115	
LFB	Sulfate	05/05/2022 12:28:09	90.1		mg/L	100	90.1	90.1				85	115	
MB	Sulfate	05/05/2022 12:08:19	<5		mg/L									
MB	Sulfate	05/05/2022 12:27:03	<5		mg/L									
908003 DUP	рН	05/04/2022 15:00:46	7.15	7.4	units						3.44			20.
CRM-PH	рН	05/04/2022 10:54:16	100.83		units	6	6	100.83				99.17	100.83	
CRM-PH	рН	05/04/2022 17:19:00	100.17		units	6	6	100.17				99.17	100.83	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Spring 2022 (909) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016 SD SDWA

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



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 909001
 Date Collected:
 05/02/2022 09:00
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 05/04/2022 08:10
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 2.3

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	СС		
Radium 228	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	CC		

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	9688	umhos/cm	1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.47	units	0.01	1	05/02/2022 09:00	05/02/2022 09:00	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.94	degrees C		1	05/02/2022 09:00	05/02/2022 09:00	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	3	NTU	0.1	1	05/02/2022 09·00	05/02/2022 09:00	JSM		

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



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909002Date Collected:05/03/2022 13:45Matrix:GroundwaterSample ID:MW1-90Date Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See			1	06/14/2022	06/14/2022	СС		
Nadidili 220	Attached			'	17:02	17:02	CC		
Radium 228	See			1	06/14/2022	06/14/2022	CC		
Nadium 220	Attached			'	17:02	17:02	CC		

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	7558	umhos/cm	1	1	05/03/2022 13:45	05/03/2022 13:45	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.77	units	0.01	1	05/03/2022 13:45	05/03/2022 13:45	JSM		_

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.85	degrees C		1	05/03/2022 13:45	05/03/2022 13:45	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.12	NTU	0.1	1	05/03/2022 13:45	05/03/2022 13:45	JSM		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909003Date Collected:05/03/2022 11:50Matrix:GroundwaterSample ID:MW2-90Date Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Padium 226	See			1	06/14/2022	06/14/2022	CC		
Radium 226	Attached			ı	17:02	17:02	CC		
Radium 228	See			1	06/14/2022	06/14/2022	CC		
Maululli 220	Attached			1	17:02	17:02			

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	7294	umhos/cm	1	1	05/03/2022 11:50	05/03/2022 11:50	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.84	units	0.01	1	05/03/2022 11:50	05/03/2022 11:50	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.94	degrees C		1	05/03/2022 11:50	05/03/2022 11:50	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.2	NTU	0.1	1	05/03/2022 11:50	05/03/2022 11:50	JSM		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909004Date Collected:05/03/2022 09:18Matrix:GroundwaterSample ID:MW3-90Date Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See			1	06/14/2022	06/14/2022	СС		
Radidili 220	Attached				17:02	17:02	CC		
Radium 228	See			1	06/14/2022	06/14/2022	CC		
Naululli 220	Attached			'	17:02	17:02	CC		

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4775	umhos/cm	1	1	05/03/2022 09:18	05/03/2022 09:18	JSM		

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.03	units	0.01	1	05/03/2022 09:18	05/03/2022 09:18	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.91	degrees C		1	05/03/2022 09:18	05/03/2022 09:18	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.64	NTU	0.1	1	05/03/2022 09·18	05/03/2022 09·18	JSM		_

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909005Date Collected:05/02/2022 12:57Matrix:GroundwaterSample ID:MW80RDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	СС		
Radium 228	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	CC		

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	4784	umhos/cm	1	1	05/02/2022 12:57	05/02/2022 12:57	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	8.3	units	0.01	1	05/02/2022 12:57	05/02/2022 12:57	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.93	degrees C		1	05/02/2022 12:57	05/02/2022 12:57	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.24	NTU	0.1	1	05/02/2022 12·57	05/02/2022 12:57	JSM		_

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909006Date Collected:05/02/2022 09:00Matrix:GroundwaterSample ID:Dup 1Date Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	СС		
Radium 228	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	CC		

Sampling Information

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	9688	umhos/cm	1	1	05/02/2022 09:00	05/02/2022 09:00	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.47	units	0.01	1	05/02/2022 09:00	05/02/2022 09:00	JSM		

Method: 170.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	6.94	degrees C		1	05/02/2022 09:00	05/02/2022 09:00	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	3	NTU	0.1	1	05/02/2022 09·00	05/02/2022 09:00	JSM		

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Report Date: Thursday, June 23, 2022 2:05:59 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:909007Date Collected:05/03/2022 12:50Matrix:GroundwaterSample ID:Field BlankDate Received:05/04/2022 08:10Collector:MVTL Field Service

Temp @ Receipt (C): 2.3 Received on Ice: Yes

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	СС		_
Radium 228	See Attached			1	06/14/2022 17:02	06/14/2022 17:02	CC		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



a member of The GEL Group INC



mod. Fou

June 01, 2022

Claudette Carroll

2616 E Broadway Ave Bismarck, North Dakota 58501

Re: Routine Analysis - Radiochemistry Work Order: 579401 SDG: 909

Dear Claudette Carroll:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 10, 2022. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1614.

Sincerely.

Delaney Stone Project Manager

Purchase Order: BL6539 Enclosures



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Report Date: Thursday, June 23, 2022 2:05:59 PM

NVII.

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Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

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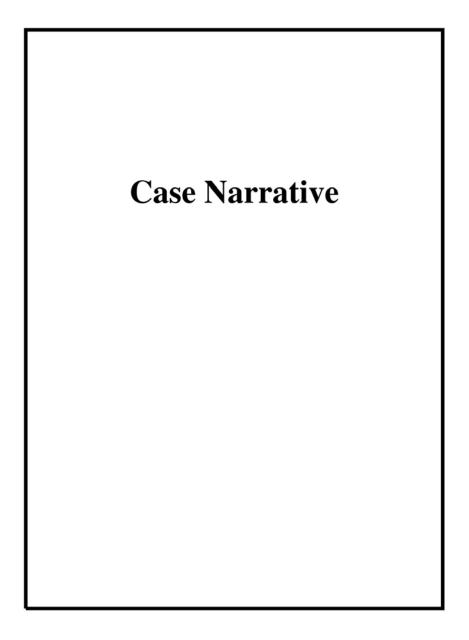
Case Narrative	1
Chain of Custody and Supporting Documentation	4
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Sample Data Summary	14
Quality Control Summary	22



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Receipt Narrative for Minnesota Valley Testing Laboratories, Inc. SDG: 909 Work Order: 579401

June 01, 2022

Laboratory Identification:

GEL Laboratories LLC 2040 Savage Road Charleston, South Carolina 29407 (843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on May 10, 2022 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
579401001	MW13
579401002	MW1-90
579401003	MW2-90
579401004	MW3-90
579401005	MW80R
579401006	Dup 1
579401007	Flied Blank

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

Delaney Stone Project Manager

Delary Stone

MVT

MINNESOTA VALLEY TESTING LABORATORIES, INC.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Chain of Custody and Supporting Documentation

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

579401	Page1of1	WO #909	Phone #:	701-258-9720	Fax #: For faxed report check hox	E-mail: ccarroll@mvtl.com	Date Submitted:	Purchase Order #:	BL6539	Analysis	Analysis Remited	Razza & Razza	Ra226 & Ra228		Date	5/10/23 1/20) 23	080					
Chain of Custody Record					Claudette					Bottle Type	Untreated 1000 ml HNO3 Umpreserved Glass Jar Other	4	4	4	4	4	4	4	All results must be reported as a numerical value	Received by:	Toon Room	
Chain of Co			Account #:		Contact: Clau	Name of Sampler:	Quote Number	Project Name/Number:			Date Time	2-May-22 900	3-May-22 1345	3-May-22 1150	3-May-22 918	2-May-22 1257	2-May-22 900	3-May-22 1250	orted as a nu		1	
							10	1			Sample Type	GW	st be rep	Sample Condition:	i i							
LABORATORIES, Inc.	ay Ave 8501	:58-9720 Fax: (701) 258-9724)1 ve):		សា	Information	Sample information	Client Sample ID	MW13	MW1-90	MW2-90	MW3-90	MW80R	Dup 1	Field Blank	Il results mu	Time:	1700	
DRATOR	2616 E Broadway Ave Bismarck, ND 58501	258-9720 Fax: (701		MAYTE	2616 E Broadway	Bismarck, ND 58501 different from abov	PO Box 249	New Ulm, MN 56073	Cample	Sample								Ē	A	Date:	4-May-22	
	ā	Phone: (701) 258-9720 Toll Free: (800) 279-6885 Fax: (70	Company Name and Address:		2616 E	Bismarck, ND 58501 Billing Address (indicate if different from above):	Po	New Uli			MVTL Lab Number	909001	909002	800606	909004	909009	900606	200606		Transferred by:		
JEVIM)		Toll Free: (8	Company Nam			Billing Address					IML Lab Number									Trans	T. Olson	2.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

> GEE Laboratories LLC SAMPLE RECEIPT & REVIEW FORM SDG/AR/COCAVerk Order: 57940 Date Received: 5 · 10 · 22 Received By: FedEx Express FedEx Ground UPS Field Services Courier Other Carrier and Tracking Number uspected Hazard Information U S +1f Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation. Hazard Class Shipped: UN#:
> If UN2910, Is the Radioactive Shipment Survey Compliant? Yes___No__)Shipped as a DOT Hazardous? B) Did the client designate the samples are to be received as radioactive? COC notation or radioactive stickers on containers equal client designation. C) Did the RSO classify the samples as m Net Counts Observed* (Observed Counts - Area Background Counts):
>
> CPM / mR/Hr
> Classified as: Rad 1 Rad 2 Rad 3 COC notation or hazard labels on containers equal client designation. D) Did the client designate samples are hazardous JFD or E is yes, select Hazards below,
> PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: E) Did the RSO identify possible hazards? 2 3 2 2 Sample Receipt Criteria Comments/Qualifiers (Required for Non-Conforming Items)
>
> Circle Applicable: Scale broken Damaged container Leaking container Other (describe) Shipping containers received intact and scaled? Circle Applicable: Circnt contacted and provided COC COC created upon receipt Chain of custody documents included 2 with shipment? Preservation Method: Wet Ice Ice Packs Dry ice None Other: 3 Samples requiring cold preservation TEMP: 23 *all temperatures are recorded in Celsius within (0 < 5 deg. C)?* Temperature Device Serial #: Z.R 1 = ZZ
> Secondary Temperature Device Serial # (If Applicable): Daily check performed and passed on IR emperature gun? Sircle Applicable: Scals broken Damaged container Leaking container Other (describe) 5 Sample containers intact and sealed? 6 Samples requiring chemical preservation at proper pH? Do any samples require Volatile Analysis? ample ID's and containers affected; ID's and tests affected: 8 Samples received within holding time? 9 Sample ID's on COC match ID's on bottles? Tircle Applicable: No dates on containers No times on containers COC missing info Other (d 10 Date & time on COC match date & time on bottles? Circle Applicable: No container count on COC Other (describe) number indicated on COC? 12 Are sample containers identifiable as GEL provided by use of GEL labels? ircle Applicable: Not relinquished Other (describe) 13 COC form is properly signed in relinquished/received sections? 12 355 901 03 6734 5893 19 6 12 555 961 03 6658 3280 186 Date 5111 27 Page of

> > GL-CHL-SR-001 Rev 7

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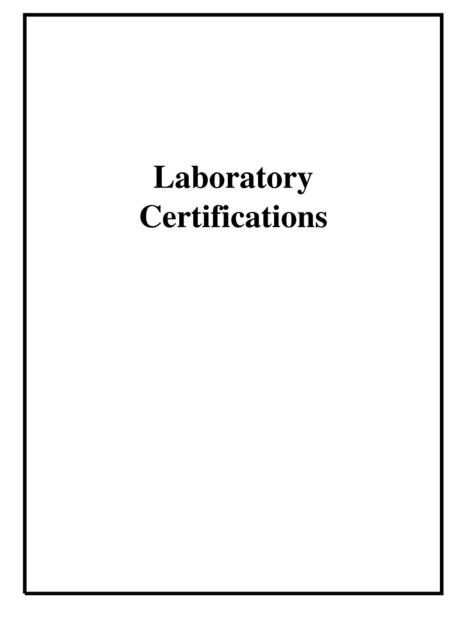
PM (or PMA) review: Initials

MVT

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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List of current GEL Certifications as of 01 June 2022

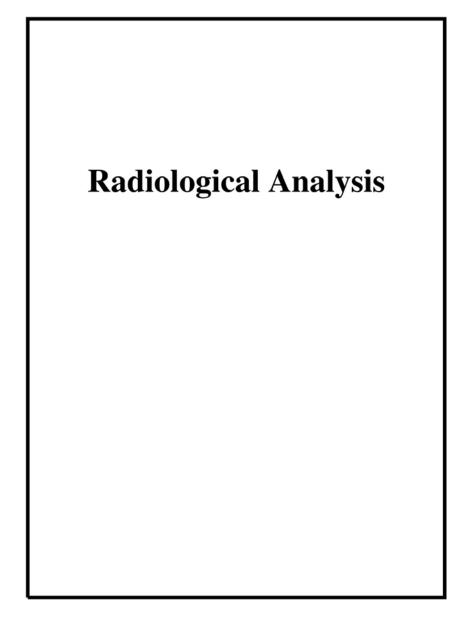
State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122022-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2019-165
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122021-36
V	VT87156
Vermont	. 10.100
Virginia NELAP	460202

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



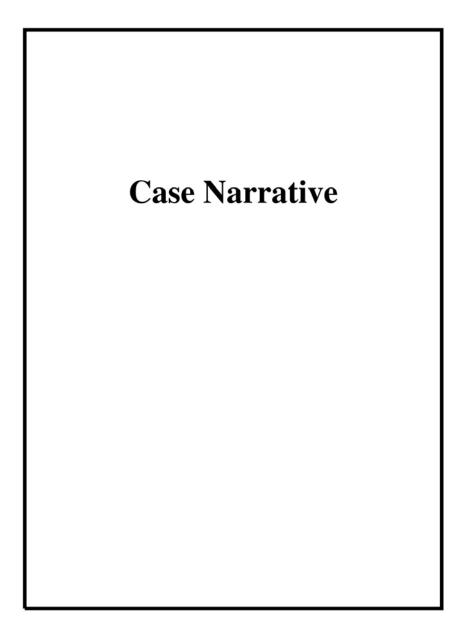
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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Radiochemistry
Technical Case Narrative
Minnesota Valley Testing Laboratories, Inc.
SDG #: 909
Work Order #: 579401

Product: GFPC Ra228, Liquid

Analytical Method: EPA 904.0/SW846 9320 Modified Analytical Procedure: GL-RAD-A-063 REV# 5

Analytical Batch: 2265144

The following samples were analyzed using the above methods and analytical procedure(s).

Client Sample Identification
MW13
MW1-90
MW2-90
MW3-90
MW80R
Dup 1
Flied Blank
Method Blank (MB)
579401001(MW13) Sample Duplicate (DUP)
Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Lucas Cell, Ra226, Liquid Analytical Method: EPA 903.1 Modified Analytical Procedure: GL-RAD-A-008 REV# 15

Analytical Batch: 2265130

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
579401001	MW13
579401002	MW1-90
579401003	MW2-90
579401004	MW3-90
579401005	MW80R
579401006	Dup 1
579401007	Flied Blank
1205090199	Method Blank (MB)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

 1205090200
 577964002(NonSDG) Sample Duplicate (DUP)

 1205090201
 577964002(NonSDG) Matrix Spike (MS)

 1205090202
 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Miscellaneous Information

Additional Comments

The matrix spike, 1205090201 (Non SDG 577964002MS), aliquot was reduced to conserve sample volume.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

MVTL001 Minnesota Valley Testing Laboratories, Inc. Client SDG: 909 GEL Work Order: 579401

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Name: Kate Gellatly

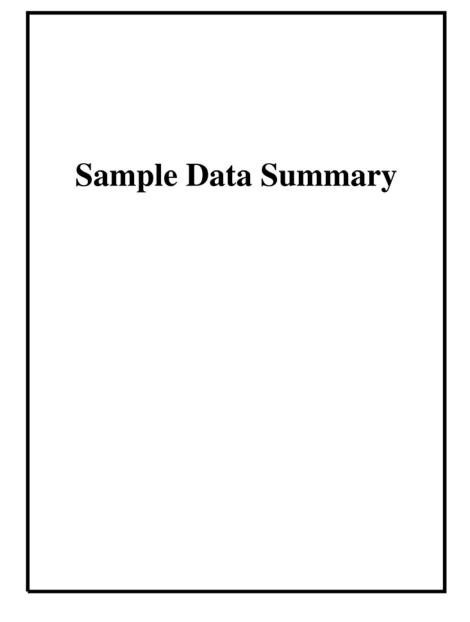
Date: 08 JUN 2022 Title: Analyst I

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll Project: Routine Analysis - Radiochemistry

Client Sample ID: MW13 Sample ID: 579401001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting	;									
GFPC Ra228, Liqui	d "As Received"										
Radium-228	U	1.22	+/-1.03	1.67	3.00	pCi/L		JXC9	06/01/22	1222 2265144	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226		0.521	+/-0.279	0.338	1.00	pCi/L		LXP1	05/25/22	0921 2265130	2
The following Anal	ytical Methods w	vere perfo	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Mo	odified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable L	imits
Barium-133 Tracer	GFPC R	a228, Liqui	id "As Received"						86.1	(15%-125%))

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501 Claudette Carroll

Contact: Claudette Carroll Project: Routine Analysis - Radiochemistry

Client Sample ID: MW1-90 Sample ID: 579401002

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Pro	portional Counting	;									
GFPC Ra228, Liq	uid "As Received"										
Radium-228	U	1.17	+/-0.990	1.59	3.00	pCi/L		JXC9	06/01/22	1222 2265144	1
Rad Radium-226											
Lucas Cell, Ra226	5, Liquid "As Recei	ved"									
Radium-226		0.820	+/-0.334	0.251	1.00	pCi/L		LXP1	05/25/22	0921 2265130	2
The following Ar	nalytical Methods w	vere perfo	ormed:								
Method	Description						Analyst C	Comment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Me	odified									
Surrogate/Tracer l	Recovery Test				R	esult	Nominal	Reco	very%	Acceptable L	imits
Barium-133 Tracer	GFPC R	a228, Liqui	id "As Received"						89.6	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501 Claudette Carroll

Contact: Claudette Carroll Project: Routine Analysis - Radiochemistry

Client Sample ID: MW2-90 Sample ID: 579401003

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF I	OF Analy	st Date	Time Batch	Method
Rad Gas Flow Pro	portional Counting	;									
GFPC Ra228, Liqu	uid "As Received"										
Radium-228	U	0.933	+/-0.795	1.26	3.00	pCi/L		JXC9	06/01/22	1223 226514	4 1
Rad Radium-226											
Lucas Cell, Ra226	, Liquid "As Recei	ved"									
Radium-226		0.528	+/-0.261	0.266	1.00	pCi/L		LXP1	05/25/22	0921 226513) 2
The following An	alytical Methods w	vere perfo	ormed:								
Method	Description						Analyst (Comment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Mc	odified									
Surrogate/Tracer F	Recovery Test				R	esult	Nominal	Reco	very%	Acceptable I	imits
Barium-133 Tracer	GFPC R	a228, Liqu	id "As Received"						88.2	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: MW3-90 Sample ID: 579401004

Matrix: Ground Water
Collect Date: 03-MAY-22 09:18
Receive Date: 10-MAY-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting	;									
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	0.766	+/-1.16	2.00	3.00	pCi/L		JXC9	06/01/22	1223 2265144	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226	U	0.125	+/-0.194	0.346	1.00	pCi/L		LXP1	05/25/22	0921 2265130) 2
The following Anal	ytical Methods w	ere perfo	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	/846 9320 1	Modified								
2	EPA 903.1 Mo	dified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable I	imits
Barium-133 Tracer	GFPC R	a228, Liqui	id "As Received"						83.9	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: MW80R Sample ID: 579401005 Matrix: Ground Water

Collect Date: 02-MAY-22 12:57
Receive Date: 10-MAY-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting										
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	-0.526	+/-0.846	1.71	3.00	pCi/L		JXC9	06/01/22	1223 226514	4 1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226		0.431	+/-0.298	0.408	1.00	pCi/L		LXP1	05/25/22	0921 226513	0 2
The following Anal	ytical Methods w	ere perfe	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	/846 9320 1	Modified								
2	EPA 903.1 Me	dified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable I	imits
Barium-133 Tracer	GFPC R	a228, Liqu	id "As Received"						90.3	(15%-125%	(-)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Client: Account #: 2800 Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll Project:

Routine Analysis - Radiochemistry

Client Sample ID: Dup 1 Sample ID: 579401006

Ground Water Matrix: 02-MAY-22 09:00 Collect Date: Receive Date: 10-MAY-22 Collector:

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting	g									
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	1.22	+/-1.11	1.83	3.00	pCi/L		JXC9	06/01/22	1223 2265144	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ived"									
Radium-226		0.432	+/-0.277	0.389	1.00	pCi/L		LXP1	05/25/22	0921 2265130	2
The following Anal	ytical Methods w	vere perfo	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Mo	odified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable L	imits
Barium-133 Tracer	GFPC R	Ra228, Liqui	id "As Received"						87.8	(15%-125%))

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

Lc/LC: Critical Level DF: Dilution Factor PF: Prep Factor RL: Reporting Limit DL: Detection Limit MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: June 8, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: Flied Blank Sample ID: 579401007

Matrix: Ground Water
Collect Date: 03-MAY-22 12:50
Receive Date: 10-MAY-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF Analy	st Date	Time Batch	Metho
Rad Gas Flow Propo	ortional Counting	;									
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	-0.0662	+/-0.867	1.66	3.00	pCi/L		JXC9	06/01/22	1223 2265144	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226	U	0.134	+/-0.208	0.371	1.00	pCi/L		LXP1	05/25/22	0952 2265130	2
The following Anal	ytical Methods v	vere perfo	ormed:								
Method	Description						Analyst	Comment	S		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Me	odified									
Surrogate/Tracer Re	covery Test				R	esult	Nomina	l Reco	very%	Acceptable L	imits
Barium-133 Tracer	GFPC F	a228, Liqu	id "As Received"						83.4	(15%-125%))

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

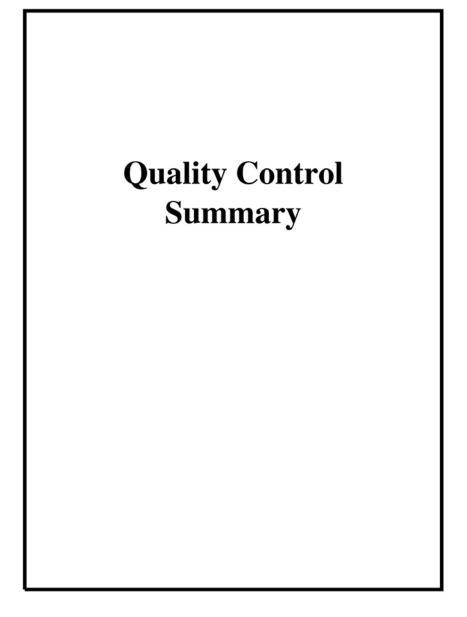
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

MVT

MINNESOTA VALLEY TESTING LABORATORIES, INC.



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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05/25/22 09:52

05/25/22 09:52

(75%-125%)

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary Report Date: June 8, 2022 Page 1 of 2 2616 E Broadway Ave Bismarck, North Dakota Contact: Claudette Carroll Workorder: 579401 NOM Sample Oual Units RPD% REC% Parmname QC Range Anlst Rad Gas Flow Batch 2265144 OC1205090238 579401001 DUP 1.22 0.988 N/A JXC9 06/01/22 12:22 Radium-228 pCi/L N/A +/-1.03 +/-0.906 Uncertainty OC1205090239 LCS Radium-228 45.7 37.6 pCi/L (75%-125%) 06/01/22 12:22 Uncertainty +/-3.13 OC1205090237 0.521 pCi/L 06/01/22 12:22 Radium-228 Uncertainty +/-1.11 Rad Ra-226 Batch 2265130 QC1205090200 577964002 DUP Radium-226 0.569 1.02 pCi/L 56.8 (0% - 100%) LXP1 05/25/22 09:52 Uncertainty +/-0.286 +/-0.429 OC1205090202 LCS Radium-226 26.7 21.9 pCi/L (75%-125%) 05/25/22 09:52 Uncertainty +/-1.54 QC1205090199 U

0.126

127

+/-8.56

+/-0.174

pCi/L

pCi/L

Notes:

Radium-226

Radium-226

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Uncertainty

Uncertainty

0.569

+/-0.286

133

The Qualifiers in this report are defined as follows:

Analyte is a Tracer compound

QC1205090201 577964002 MS

- < Result is less than value reported
- Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- Analytical holding time was exceeded

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



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Client: Montana-Dakota Utilities - Bismarck Account #: 2800

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

OC Summary

				QC SI	шша	y						
Workor	rder: 579401										Pag	e 2 of 2
Parmna	me	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J	See case narrative for an expl	lanation										
J	Value is estimated											
K	Analyte present. Reported va	lue may be biased	high. Actual	value is e	xpected to	be lower.						
L	Analyte present. Reported va	lue may be biased	low. Actual	value is ex	spected to b	e higher.						
M	M if above MDC and less tha	an LLD										
M	REMP Result > MDC/CL an	d < RDL										
N/A	RPD or %Recovery limits do	not apply.										
N1	See case narrative											
ND	Analyte concentration is not	detected above the	detection lin	nit								
NJ	Consult Case Narrative, Data	Summary packag	e, or Project	Manager o	concerning	this qualifi	er					
Q	One or more quality control of	criteria have not be	en met. Refe	r to the ap	plicable na	rrative or I	DER.					
R	Sample results are rejected											
U	Analyte was analyzed for, bu	t not detected above	ve the MDL,	MDA, M	DC or LOD							
UI	Gamma SpectroscopyUnce	rtain identification	i.									
UJ	Gamma SpectroscopyUnce	rtain identification	E.									
UL	Not considered detected. The	associated number	er is the repor	ted conce	ntration, wh	ich may b	e inaccurate	due to a low	bias.			
X	Consult Case Narrative, Data	Summary packag	e, or Project	Manager o	concerning	this qualifi	er					
Y	Other specific qualifiers were	e required to prope	rly define the	results. C	Consult case	narrative.						
٨	RPD of sample and duplicate	evaluated using +	-/-RL. Conce	ntrations	are <5X the	RL. Qual	lifier Not Ap	plicable for	Radiochem	istry.		

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where the duplicate value is less than 5X the RL, a control limit of +/- the RL is used to

evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

Preparation or preservation holding time was exceeded

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Page 24 of 24 SDG: 909





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MI	2616 E. B	ota Valley To roadway Ave , ND 58501 9720	3/1	aborat	ories			WO:		a Utilities — Bis	Chain of Custody Record
Report To:	MDU Todd Peterson			CC:						Project Name:	MDU Heskett
Address:	400 N. 4th St Bismarck, ND 58501									Event:	Spring 2022
Phone: Email:	701-425-2427 Todd.Peterson@mdu.c	com								Sampled By:	Screeny Moyer
	Sam	ple Information	1			Sample (Containe	rs		Field Readings	
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Nitric						Analysis Required
001	MW13	2 Hay 22	0900	GW	4		Ш				
002	MW1-90	3 May 22	1345	GW	4		П				
003	MW2-90	3 May 22	1/50	GW	4						
003	MW3-90	3 Mzy 22	0913	GW	4						
003	11111000		1		4						Rad 226 & 228
	MW80R	Z May 22	1257	GW	14 1		1 1		1		
004		2 May 22	1257	GW	4		H				

Relinquished By		Sampl	e Condition	Receive	d By
Name /	Date/Time	Location	Temp (°C)	/ Name	Date/Time
77/2	4Mm 22 0810	Walk In #2	2.3 TM562/TM805	Turken	4May 22

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

Report Date: Thursday, June 23, 2022 2:05:59 PM

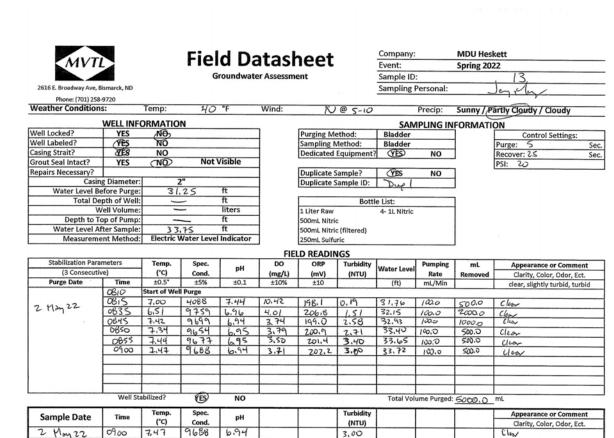


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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Comments:



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Client: Montana-Dakota Utilities - Bismarck Account #: 2800



Field Datasheet

Groundwater Assessment

MDU Heskett Company: Event: Spring 2022 Sample ID: Sampling Personal:

Total Volume Purged: 6500,0 mL

Control Settings

Weather Conditions: Wind: 50 °F N @ 5-10 Sunny / Partly Cloudy / Cloudy Temp: Precip: WELL INFORMATION
YES (NO)
YES NO SAMPLING INFORMATION Purging Method: Bladder Well Locked? Well Labeled? Sampling Method: Bladder Purge: Casing Strait? NO Recover: 55 Not Visible Grout Seal Intact? YES NO CNO **Duplicate Sample?** Repairs Necessary?

Casing Diameter: YES Duplicate Sample ID: Water Level Before Purge: Total Depth of Well: Well Volume: Bottle List: liters 1 Liter Raw 4- 1L Nitrio Depth to Top of Pump: ft 500mL Nitric 500mL Nitric (filtered) Water Level After Sample: 10, 1구 ft Electric Water Level Indicator Measurement Method: 250mL Sulfuric FIELD READINGS

Stabilization Para	meters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	ve)	(°C)	Cond.	Pri	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
	1240	Start of Wel	l Purge								
3 May 22	1245	6.69	7585	692	1.88	165.9	0,20	10.10	100.0	500.0	Clear
	1305	6,43	ର ୦୯୫	6.91	1.38	183.0	0.13	10,32	100,0	2000,0	Clear
	1315	6.43	9554	6.91	1,29	186.5	0.12	10.34	100.0	10000	Cka
	1320	6.65	Bb13	6.89	1.28	189.9	0.14	10.27	(JO)	500.0	Clear
	1325	6,46	2987	629	1.13	191.6	0.12	10.18	1000	500.0	Clear
	1330	6.58	75182	6,89.	1.15	193.5	0.14	10,20	100.0	500.0	Clear
	1335	6.69	7423	6.89	1.26	193.8	0.14	10.21	100,0	50.0	Clear
	1340	6.71	7468	6.86	1, 31	194,7	0.13	10,18	100.0	500.0	Ctes
1	1245	6.77	7558	6.85	1.33	195.10	0.12	10.15	100.0	500.0	Char

Sample Date	Time	Temp. (°C)	Spec. Cond.	pH	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
3 May 22	1345	6.77	7558	6.85	0,12	Cloor
Comments:	Collecter	d Fuld	Blank I	· 8 125)	

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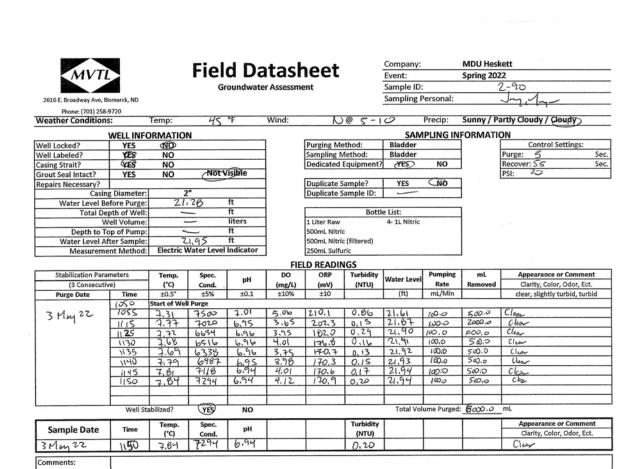
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Account #: 2800

Client:

Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

2616 E. Broadway Ave, Bismarck, ND		Field Datasheet Groundwater Assessment						Company: Event: Sample ID:		MDU Heskett		
										Spring 2022		
										3-90		
									Sampling Personal:		J7/2	
Phone: (701) 258	3-9720											
Weather Condition	is:	Temp:	40	°F	Wind:	N	@5-10		Precip:	Sunny / 12	artly Cloudy / Cloudy	
	WELL INFO	ORMATIO	N			·		SAM	PLING IN	FORMATI	ON	
Well Locked?	YES	(NO)			7	Purging M	ethod:	Bladder		1	Control Settings:	
Well Labeled?			7	Sampling Method: Bladder				1	Purge: 5 Sec			
Casing Strait?	VES	NO		-		Dedicated	Equipment:	(YES)	NO]	Recover: 55 Sec.	
Grout Seal Intact?	YES	NO	(Not \	/isible							PSI: 20	
Repairs Necessary?						Duplicate Sample? YES NO			Ø₩0			
Casing Diameter:		2"			1	Duplicate S	Sample ID:					
Water Level B		18.	31	ft	1							
Total Depth of Well:		ft			1	Bottle List:			1			
Well Volume:		liters			1	1 Liter Raw 4- 1L Nitric			1			
Depth to Top of Pump:		— ft			4	500mL Nitric						
Water Level After Sample:		[8,4] ft Electric Water Level Indicator			4	500mL Nitric (filtered)				1		
Measurem	ent Method:	Electric	Water Level	Indicator	J	250mL Sulfu	ıric			J		
					FIE	LD READIN	NGS					
Stabilization Parameters		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment	
(3 Consecutive)		(°C)	Cond.		(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	
	0828	Start of We										
3 May 22	0833	5.97	4 794	6.96	3,29	125.5	16.08	18.42	1000	5000	Clear	
	0853	5.99	4803	6,92	3,83	162.2	2,47	18,40	100.0	G0002	Clear	
	0903	5,99	4865	6,92	3.82	170.3	1.41	18,40	10000	1000,0	Clear	
	0908	6.01	4792	6.91	3,65	174.9	1.92	18,38	100-0	5000	Clear	
	0913	6.13	4792	6.91	3,72	1779.6	1.69	18.39	100.0	500,0	Clear	
	0918	6.03	4775	6,91	3,79	182,3	0.64	16,40	140.0	500.0	Clear	
			-				-					
								_				
	144-11-01	abilized?						T-1-11/-1			mL .	
	Well St	abilized?	YES	NO				lotal vol	ume Purged	5000 N		
Sample Date	Time	Temp.	Spec.	pH			Turbidity				Appearance or Comment	
Sumple Date		(°C)	Cond.	6.91			(NTU)				Clarity, Color, Odor, Ect.	
3 4 hay 22	09,8	6.03	4775				0.64					

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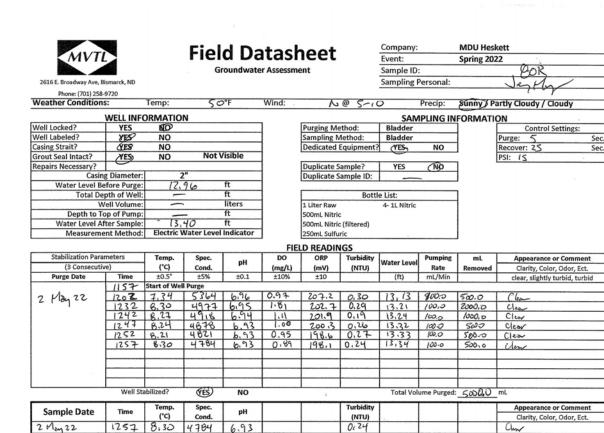


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Report Date: Thursday, June 23, 2022 2:05:59 PM

Comments:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL
2616 E. Broadway Ave, Bismarck,

MW105

Field Datasheet

Surface water Assessment

1154

Company: MDU Lewis & Clark
Event: Spring 2022

Sampling Personal:

Phone: (701) 258-9720 45°F Weather Conditions: Temp: Wind: N @ 5-10 Precip: Sunny / Partly Cloudy / Cloudy Casing Water Well ID Date Time Comments Diameter Level (ft) MW70 1130 21.78 MW33 1150 42.76 2" 1132 37.94 MW101 2" 2 May 22 1128 19.50 MW102 2" MW103 1140 2" 36,74 MW44R 1137 2" 27.14 1147 2" 14,18 MW104

11.78

2"

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Aug-22 (2603) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 2603001
 Date Collected:
 08/08/2022 12:25
 Matrix:
 Groundwater

 Sample ID:
 MW2-90
 Date Received:
 08/08/2022 13:30
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 14.0 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units R	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	8351	umhos/cm 1	1	1	08/08/2022 12:25	08/08/2022 12:25	JSM		_

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7	units	0.01	1	08/08/2022 12:25	08/08/2022 12:25	JSM		

Method: 170.1

Parameter	Results	Units RDL	. DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	17.16	degrees C	1	08/08/2022 12:25	08/08/2022 12:25	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	<0.1	NTU	0.1	1	08/08/2022 12:25	08/08/2022 12:25	JSM		

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Calcium	508	mg/L	5	5	08/08/2022 17:15	08/10/2022 11:05	SLZ	MA,NDA	
Calcium, Dissolved	471	mg/L	5	5	08/09/2022 17:44	08/16/2022 14·20	SLZ	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 2603002
 Date Collected:
 08/08/2022 11:35
 Matrix:
 Groundwater

 Sample ID:
 MW3-90
 Date Received:
 08/08/2022 13:30
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 14.0 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	5278	umhos/cm	1	1	08/08/2022 11:35	08/08/2022 11:35	JSM		

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	6.92	units	0.01	1	08/08/2022 11:35	08/08/2022 11:35	JSM		

Method: 170.1

Parameter	Results	Units F	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	13.03	degrees C		1	08/08/2022 11:35	08/08/2022 11:35	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	<0.1	NTU	0.1	1	08/08/2022 11:35	08/08/2022 11:35	JSM		

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Calcium	501	mg/L	5	5	08/08/2022 17:15	08/10/2022 11:06	SLZ	MA,NDA	
Calcium, Dissolved	494	mg/L	5	5	08/09/2022 17:44	08/16/2022 14:22	SLZ	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:2603003Date Collected:08/08/2022 10:39Matrix:GroundwaterSample ID:MW80RDate Received:08/08/2022 13:30Collector:MVTL Field Service

Temp @ Receipt (C): 14.0 Received on Ice: Yes

Method: 120.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	6532	umhos/cm	1	1	08/08/2022 10:39	08/08/2022 10:39	JSM		

Method: 150.2

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7	units	0.01	1	08/08/2022 10:39	08/08/2022 10:39	JSM		

Method: 170.1

Parameter	Results	Units RDL	. DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	15.58	degrees C	1	08/08/2022 10:39	08/08/2022 10:39	JSM		

Method: EPA 180.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	<0.1	NTU	0.1	1	08/08/2022 10:39	08/08/2022 10:39	JSM		

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	154	mg/L	2.0	1	08/12/2022 09:15	08/12/2022 09:15	EJV	MA,NDA	

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Account #:

2800

Client: Montana-Dakota Utilities - Bismarck



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

August 12, 2022

Montana-Dakota Utilities **Todd Peterson** 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

On August 8, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND.

This event consisted of resampling 4 wells. Samples were collected from 3 of the 4 wells. Well MW1-90 was not able to be sampled due to damage.

Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

AVTI; guarantees the pecuracy of the analysis dance on the sample submitted for training, Is is and possible for MVTI; to guarantee that a text requit obtained on a particular sample will be the sail transitions affecting the sample are the same, including sampling by MVTI.—As a monad protection to clients, the public and nutralives, all reports are admitted as the confidential property publication of sitements, condictions or extracts from or regarding near reports in receively permitted unywrither approves.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	Minne 2616 E. Bismard (701) 250	orie	Monlana - Dakota Utilities - Bi W0: 2603					s – Bi	Chain of Custody Record					
Report To: Attn:	MDU Todd Peterson			cc:							Project N	ame:		MDU Heskett
Address:	400 N. 4th St										Event:			Aug-22
Phone: Email:	Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu	.com									Sampled	Ву:	Jerry	/
	Sa		Sample Containers						Field Re	eadings				
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HN03	500 mL HNO3 (filtered) 250 mL H2SO4			Temp ("C)	Spec. Cond.	Hd	Turbidity (NTU)	Analysis Required
_	MW1-90	BAy22	1254	GW	×	X	XX			Demo				TDS, Flouride, Boron (T+D
00.1	MW2-90	BA4 22	1225	GW		Х	X			17.16	8351	7.00	0.02	Calcium (T+D)
002	MW3-90	BAy 22	1135	GW		х	X			13.03	5278	6.92	0.08	Calcium (T+D)
003	MW80R	8Ay22	1039	GW	X			П		15.58	6532	7,00	0,05	Chloride
Comments:	*8 ty 22 +													T+D = Total and Dissolved
	Relinquished By			Samp	le Co	ond	ition					Receive	ed Bv	
	Name /	Date/Time		ation	T		Temp (°C)			- 10				Date/Time
1	1	8 A- 22	10	g-lin			Rot 14	.0	6.00				8 Aug 22	

TM562 / TM805





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

141/77	4		امنا	4 Da	tack	neet		Company:		MDU Hes	kett
MVTL	2		riei	u Do	itasi	ieet		Event:			
			Gı	roundwate	r Assessm	ent		Sample ID:	:	[-	90.
2616 E. Broadway Ave, Bis	marck, ND							Sampling F	Personal:	7	17/1-
Phone: (701) 258-9											*
Weather Conditions:		Temp:		°F	Wind:		@		Precip:	Sunny / P	artly Cloudy / Cloudy
V	WELL INFO	RMATIO	N					SAM	IPLING IN	FORMATI	ON
Well Locked?	YES	NO			1	Purging Me	thod:	Bladder			Control Settings:
Well Labeled?	YES	NO				Sampling M	ethod:	Bladder			Purge: S
Casing Strait?	YES	NO]	Dedicated E	quipment?	YES	NO		Recover: S
Well Seal Intact?	YES	NO	Not \	/isible							PSI:
Repairs Necessary?						Duplicate Sa		YES	NO		
	Diameter:	2	2"]	Duplicate Sa	mple ID:				
Water Level Bef				ft]						
	th of Well:	_	_	ft			Bott	le List:		1	
	ell Volume:		_	liters	1	1 Liter Raw		4- 1L Nitric			
Depth to Top				ft	1	500mL Nitric				ı	
Water Level Aft				ft	1	500mL Nitric					
Measuremen	it Method:	Electric V	Water Level	Indicator	J	250mL Sulfur	ic			J	
					FIE	LD READIN	GS				
Stabilization Param	neters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutive	e)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
		Start of Wel	l Purge								
L											
Į.											
1						1					
1											
			L	L						L	L
	Well Sta	bilized?	YES	NO				Total Vol	ume Purged:		mL
	Time	Temp.	Spec.	pН			Turbidity				Appearance or Comment
Sample Date		(°C)	Cond.				(NTU)				Clarity, Color, Odor, Ect.
Sample Date	10011									ı	1
Sample Date	1254										
	wel	1 dem	and								

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Appearance or Comment

Clarity, Color, Odor, Ect.

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVI			Fiel	4 D	atacl	heet		Company:		MDU Hes	kett	
MVI			1161	uDo	atasi	ieet		Event:				
			G	roundwat	er Assessm	ent		Sample ID	:		2~90	
2616 E. Broadway Ave,	Bismarck, ND							Sampling	Personal:		Jarla .	
Phone: (701) 25	8-9720											
Weather Conditio	ns:	Temp:	75	°F	Wind:	N	@ <-60)	Precip:	Summy / P	artly Cloudy / Cloud	ly
	WELL INFO	ORMATIO	N				1		IDI ING IN	FORMATI	ON	
Well Locked?	YES	CON	14		7	Purging Me	ethod:	Bladder	IF LING III		Control Setti	nøs:
Well Labeled?	SES)	NO			1	Sampling N		Bladder		1	Purge: 3	Sec.
Casing Strait?	YES	NO			1		Equipment?		NO	1	Recover: 27	Sec.
Well Seal Intact?	YES	NO	(Not)	/isible	7					•	PSI: 20	
Repairs Necessary?					1	Duplicate S	ample?	YES	(NO)	1		
Casi	ng Diameter:		2"]	Duplicate S		_	-	/		
Water Level	Before Purge:	22	25	ft						-		
	epth of Well:	ft			Bottle List:]			
	Well Volume:					1 Liter Raw		4-11-Nitric		1		
	Top of Pump:	22.4		ft	_	500mL Nitri	c					
	After Sample:	Belo	w Porg	ft	_	500mL Nitri						
Measuren	nent Method:	Electric	Water Level	Indicator		250mL Sulfu	ric					
					FIE	LD READIN	IGS					
Stabilization Pa	rameters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Co	omment
(3 Consecu	tive)	(°C)	Cond.	PΠ	(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Od	lor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	ml./Min		clear, slightly turbi	id, turbid
e A 22	1155	Start of We						(48)				
8 Aug 22	1200	18.32	8351	7.00	4.54	203.9	0.04	Below Pup	100.0	500.0	Clea	
	1210	17.44	8371	6.99	3.71	212,9	0.06	BP .	100.0	1000.0	cles	
	1215	17.40	8355	6,99	3,68	214.9	0.04	BA	100,0	500,0	Clear	
	1220	17.32	8359	7.00	3,62	216.2	0.03	16 0	(00.0	500.0	Clerr	
	1225	17.16	8351	7,00	3:62	217.2	0,02	BP	100.0	500.0	Cles	
	-											
				-	+	-					-	
					+	+						
					-	+						

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Turbidity

(NTU)

0.02

Report Date: Wednesday, August 17, 2022 3:06:30 PM

(°C)

1225

Cond.

7.00

Sample Date

8 Agzz

Comments:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



Field Datasheet

Groundwater Assessment

 Company:
 MDU Heskett

 Event:
 3-90

 Sample ID:
 3-90

 Sampling Personal:
 J-10

Precip: Sunny / Partly Cloudy / Cloudy

Purge: Recove PSI:

Control Settings:

Phone: (701) 258-	9720				
Weather Condition	s:	Temp:	71	5 °F	Wind:
	WELL INFO	RMATION			
Well Locked?	YES	₩O.			7
Well Labeled?	AES.	NO			
Casing Strait?	YES	NO			
Well Seal Intact?	YES	NO	₩.	t Visible	
Repairs Necessary?					
Casin	g Diameter:	2"			
Water Level Be	efore Purge:	19,7	-5	ft	
Total De	pth of Well:		_	ft	
W	ell Volume:			liters	
Depth to To	op of Pump:	20,7	20	ft	
Water Level At	fter Sample:	19.	93	ft	
Measureme	nt Method:	Electric W	ater Le	vel Indicator	-

	SAM	PLING II	NFORMAT	ION
Purging Method:	Bladder		7	
Sampling Method:	Bladder		7	Pur
Dedicated Equipment?	VES	NO	7	Rec
			_	PSI:

N@ 5-10

Duplicate Sample | YES QUO

Duplicate Sample ID:

Bottle List:

1-LiterRaw
4-1L Nitrie
500mL Nitric (filtered)
250mL Sulfuric

FIELI	d readin	IGS
-		_

Stabilization Para	meters	Temp.	Spec.	рH	ВО	ORP	Turbidity	Water Level	Pumping	mL.	Appearance or Comment
(3 Consecuti	ve)	(°C)	Cond.	pii	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
8 Aug 27	11.05	Start of Wel	l Purge								
& Aug 22	1110	12.82	5287	6.95	2.32	174.0	0.76	19.90	1000	500.0	Clear
	1120	12.74	5285	6.93	2.27	1426	0,33	19.90	100.0	1000.0	Clear
	1125	13,19	5278	6,92	2,23	133.9	0.02	19.91	G,C0j	580.0	iles
	1130	12,94	5274	6.93	2,20	127.6	0,10	19.92	100.0	520.0	cles
	1(35	13,03	5278	6,92	2,20	124.2	0,09	19.92	(00.0	500.0	Clear
		-									
L			10			L					
	Well St	abilized?	YES	NO				Total Vol	ıme Purged:	30∞,0	mL

Sample Date	Time	Temp.	Spec.	pH	Turbidity	Appearance or Comment
Sample Date		(°C)	Cond.	p	(NTU)	Clarity, Color, Odor, Ect.
8 Aug 22	1135	13.03	5278	6.92	0.08	Cless

Comments:

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Client: Montana-Dakota Utilities - Bismarck Account #: 2800



Phone: (701) 258-9720

Field Datasheet

Groundwater Assessment

MDU Heskett Company: Event: Sample ID: MWEOR Sampling Personal: Sich

Precip: Sunny / Partly Cloudy / Cloudy

PSI:

Recover: 27

Control Settings:

Weather Conditions: Temp: Wind: WELL INFORMATION Well Locked? (NO) YES Well Labeled? (YES) Casing Strait? NO Not Visible Well Seal Intact? NO YES Repairs Necessary? Casing Diameter: Water Level Before Purge: 141.65 Total Depth of Well: Well Volume liters Depth to Top of Pump: ft Water Level After Sample: Measurement Method: Electric Water Level Indicator

SAMPLING INFORMATION Purging Method: Bladder Sampling Method: Bladder Dedicated Equipment YES) NO **Duplicate Sample?** YES (NO)

N @5~10

Duplicate Sample ID:

Bottle List: 1 Liter Raw 500ml Nitric 500mL Nitric (filtered) 250mL Sulfurie

FIELD READINGS

Stabilization Par	ameters	Temp.	Spec.	pH	DO	ORP	Turbidity	Water Lauri	Pumping	mL	Appearance or Comment
(3 Consecut	ive)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
A A 22	0949	Start of Wel	l Purge		-						
8 Ay 22	0954	1265	6407	7.01	0.53	1927	0.04	15.08	100.0	500,0	Clos
	1014	14.28	6476	7.00	0.30	184.9	0.03	15.05	100,0	20000	Clear
	1024	15,20	6538	7.00	0.29	184.0	0.02	15.06	100.0	1000.0	Clear
	1029	15.40	6985	1,00	030	184.0	0.00	15.07	180.0	5,00,0	Clacy
	1034	15,52	6500	7.00	0.29	1840	0.07	15,07	160,0	500.0	Clare
	1039	15.58	6532	7.00	0.31	183.5	0.05	12,08	100.0	500.0	Clos
	Well St	abilized?	YES	NO				Total Vol	ume Purged:	5000.0	mL

Sample Date	Time	Temp. (°C)	Spec. Cond.	рН	Turbidity (NTU)	Appearance or Comment Clarity, Color, Odor, Ect.
8 Aug 22	1039	15,58	6532	7.00	0.05	Clear
Comments:						

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Original Sampl QC Type	Analyte	Analysis Date	QC Result	Original S	ample R∈Units	Spike Amo S	pike Resu S _l	pike % Recov Spil	ke Duplicat Spik	e Duplicat∈RP	D (%) Low	er Control Lim Upper (Control Lim RPD	Limit (%)
2514001 PDS	Calcium	08/10/2022 10:22:17	101	115	mg/L	100	215.4	101				75	125	
2514001 PDSD	Calcium	08/10/2022 10:22:50	99.8	115	mg/L				214.5	99.8	0.42	75	125	20
2565005 PDS	Calcium	08/10/2022 10:37:15	96.2	142	mg/L	100	238.4	96.2				75	125	
2565005 PDSD	Calcium	08/10/2022 10:37:47	94.4	142	mg/L				236.6	94.4	0.76	75	125	20
2565017 PDS	Calcium	08/10/2022 10:49:25	105	52.4	mg/L	100	157.4	105				75	125	
2565017 PDSD	Calcium	08/10/2022 10:49:57	105	52.4	mg/L				157	105	0.25	75	125	20
2568001 PDS	Calcium	08/10/2022 10:58:21	108		mg/L	100	130.4	108				75	125	
2568001 PDSD	Calcium	08/10/2022 10:58:52	107		mg/L				129.7	107	0.54	75	125	20
2593001 DUP	Calcium	08/10/2022 11:04:06	96.11	96.6	mg/L						0.51			20
2593001 PDS	Calcium	08/10/2022 11:04:37	102	96.6	mg/L	100	198.4	102				75	125	
2593001 PDSD	Calcium	08/10/2022 11:05:09	103	96.6	mg/L				199.5	103	0.55	75	125	20
2640007 PDS	Calcium	08/10/2022 11:19:29	101	93.0	mg/L	100	194.4	101				75	125	
2640007 PDSD	Calcium	08/10/2022 11:20:01	103	93.0	mg/L				196.4	103	1.02	75	125	20
2640009 PDS	Calcium	08/10/2022 11:23:34	101	96.0	mg/L	100	196.9	101				75	125	
2640009 PDSD	Calcium	08/10/2022 11:24:05	100	96.0	mg/L				196.2	100	0.36	75	125	20
LFB-MI	Calcium	08/10/2022 11:03:03	106		mg/L	100	106.5	106				85	115	
MB	Calcium	08/10/2022 11:02:11	<1		mg/L									
2603002 SPK	Calcium, Dissolved	08/16/2022 14:24:00	92.4	494	mg/L	500	956.1	92.4				75	125	
2603002 SPKD	Calcium, Dissolved	08/16/2022 14:27:00	94.8	494	mg/L				968.1	94.8	1.25	75	125	20
LFB-MI	Calcium, Dissolved	08/10/2022 11:03:03	106		mg/L	100	106.5	106				85	115	
MB	Calcium, Dissolved	08/10/2022 11:02:11	<1		mg/L									
2640001 MS	Chloride	08/12/2022 10:29:01	86.4	8.1	mg/L	30	34	86.4				80	120	
2640001 MSD	Chloride	08/12/2022 10:30:11	87.7	8.1	mg/L				34.4	87.7	1.17	80	120	20
2683004 MS	Chloride	08/12/2022 11:04:28	91.3	21.2	mg/L	60	76	91.3				80	120	
2683004 MSD	Chloride	08/12/2022 11:05:39	90.6	21.2	mg/L				75.6	90.6	0.53	80	120	20
2693005 MS	Chloride	08/12/2022 11:23:23	85.4	6.9	mg/L	30	32.5	85.4				80	120	
2693005 MSD	Chloride	08/12/2022 11:24:35	85	6.9	mg/L				32.4	85	0.31	80	120	20
LFB	Chloride	08/12/2022 11:08:01	95.2		mg/L	30	28.6	95.2				90	110	
LFB	Chloride	08/12/2022 09:10:37	95.3		mg/L	30	28.6	95.3				90	110	
LFB	Chloride	08/12/2022 10:49:06	95.6		mg/L	30	28.7	95.6				90	110	
LFB	Chloride	08/12/2022 11:26:56	95.1		mg/L	30	28.5	95.1				90	110	
LFB	Chloride	08/12/2022 09:27:11	95.6		mg/L	30	28.7	95.6				90	110	
LFB	Chloride	08/12/2022 10:32:33	95.7		mg/L	30	28.7	95.7				90	110	
MB	Chloride	08/12/2022 11:25:45	<2.00		mg/L									
MB	Chloride	08/12/2022 11:06:50	<2.00		mg/L									
MB	Chloride	08/12/2022 10:47:55	<2.00		mg/L									
MB	Chloride	08/12/2022 09:26:00	<2.00		mg/L									
MB	Chloride	08/12/2022 09:09:26	<2.0		mg/L									
A 4D	011 11	00/40/0000 40 04 00	0.00											

mg/L

MB

Chloride

08/12/2022 10:31:22 <2.00



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett (2721) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

2721001 (MW 1-90) - Sample

A portion of the unpreserved sample was filtered in the laboratory and then preserved as necessary. This filtered, preserved sample was used for the analysis of any dissolved parameters.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 2721001
 Date Collected:
 08/11/2022 11:55
 Matrix:
 Groundwater

 Sample ID:
 MW 1-90
 Date Received:
 08/11/2022 14:54
 Collector:
 Client

Temp @ Receipt (C): 3.2 Received on Ice: Yes

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	7280	mg/L	250	50	08/17/2022 10:27	08/17/2022 10:27	EJV	MA,NDA	
Method: EPA 6010D									

Danamatan

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.29	mg/L	0.1	1	08/12/2022 16:35	08/15/2022 14:52	SLZ	MA,NDA	
Calcium	370	mg/L	1	1	08/12/2022 16:35	08/16/2022 13:36	SLZ	MA,NDA	

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	97.0	mg/L	2.0	1	08/17/2022 12:23	08/17/2022 12:23	EJV	MA,NDA	

Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.14	mg/L	0.1	1	08/12/2022 14:41	08/12/2022 14:41	RAA		

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	12700	mg/L	10	1	08/12/2022 14:45	08/12/2022 14:45	AMC	MA,NDA	

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Report Date: Friday, August 19, 2022 3:45:33 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

4.50								10-1	tana – Dakota Ut	ilities –	Bis	
Barr Engineering Co.		- 6						W	0: 2721		1	COC Number: Nº 590272
REPORT TO		-		INVOICE T			1	(414	10 10 10 10 10 10		- 2	Matrix Code: Preservative Code:
company: Barr Engineenha	(0	Comp		MDU				25		117	П	GW = Groundwater A = None SW = Surface Water B = HCI
ddress:		Addre					Z	SS Sin			П	WW = Waste Water $C = HNO_3$ DW = Drinking Water $D = H_2SO_4$
mail: aschneidereba		Name email:	100	dd Peter	300	C-112	1 1	lashe				S = Soil/Solid
opy to: BarrDM@barr.com	T. LOW	P.O.	IUdo	, jeduson v	- man.	COM						H = Na ₂ S ₂ O ₃ I = Ascorbic Acid
roject Name: MDU Heskett		Barr F	Project I	No: 34300	14		MS/	9 0			Solids	J = Zn Acetate
100.		ple De		Collection	Collection		ε	SOC L			% S	K = Other
Location	Start	Stop	Unit (m./ft. or in.)	Date (mm/dd/yyyy)	Time (hh:mm)	Matrix Code	Perform	MNN			-	Preservative Code Field Filtered Y/N
MW 1-90	-			08/11/2022	1155	GW	N	4211				Analyze for:
							Ц					Floride, TDS, Boron.
							Н				4	Major Jons: Ca, Ma
							Н	+++				K, Na, A1K, C1, 504
						\vdash	Н	+++			+	Dissolved B, K, Na, Ca, M
							Н	+++			+	
							Н				+	
							H	+++				Questions : Anna Schneider
												952-832-2771
BARR USE ONLY	4	Reling	uished/)	DV: 1 - 1	QR QR	Ice? 8-1	Date	Time, /	Received by	VI	_	
mpled by: DTZ							1 6	D Time	July	M	_	
rr Proj. Manager;		Relinq	uished t	O.V.		Ice?	Date	Time '	Received by:			Date Time
b Name: MI/TL			es Shipp Sampler	ped VIA: ☐ Gro	ound Courier		Air Ca	MVTL	Air Bill Numb	er:		Requested Due Date:
b Location: RISMANCK A	D	Lab W							y Seal Intact?	Y D	N .	X None □ Rush

Original Sampl QC Type	Analyte	Analysis Date	QC Result	Original S	Sample ReUnits	Spike Amo Sp	oike Resu Sp	ike % Recov Spil	ke Duplicat Spik	e Duplicate RPD	(%) L	ower Control Lim Upper Co	ontrol Lim RPD	Limit (%)
2721001 MS	Boron	08/15/2022 14:54:00	80.5	0.29	mg/L	0.4	0.6154	80.5				70	130	
2721001 MSD	Boron	08/15/2022 14:55:53	82.9	0.29	mg/L				0.6251	82.9	1.56	70	130	20
LFB-OE	Boron	08/15/2022 14:50:13	93.3		mg/L	0.4	0.373	93.3				85	115	
MB	Boron	08/15/2022 14:48:30	<0.1		mg/L									
2693005 PDS	Calcium	08/16/2022 11:33:02	96.7	41.5	mg/L	100	138.2	96.7				75	125	
2693005 PDSD	Calcium	08/16/2022 11:35:04	96.7	41.5	mg/L				138.2	96.7	0.00	75	125	20
2716001 DUP	Calcium	08/16/2022 11:55:25	45.76	45.4	mg/L						0.79			20
2718004 PDS	Calcium	08/16/2022 12:10:32	95.9	97.7	mg/L	100	193.6	95.9				75	125	
2718004 PDSD	Calcium	08/16/2022 12:12:37	97	97.7	mg/L				194.7	97	0.57	75	125	20
2718009 DUP	Calcium	08/16/2022 12:25:07	333.3	331	mg/L						0.69			20
2719003 PDS	Calcium	08/16/2022 12:55:52	98.6	98.1	mg/L	100	196.7	98.6				75	125	
2719003 PDSD	Calcium	08/16/2022 12:57:56	95	98.1	mg/L				193.1	95	1.85	75	125	20
2719006 DUP	Calcium	08/16/2022 13:06:29	378.1	388	mg/L						2.58			20
2720002 PDS	Calcium	08/16/2022 13:17:33	92.9	90.5	mg/L	100	183.4	92.9				75	125	
2720002 PDSD	Calcium	08/16/2022 13:19:36	90.8	90.5	mg/L				181.3	90.8	1.15	75	125	20
2720010 DUP	Calcium	08/16/2022 13:45:40	56.71	57.2	mg/L						0.86			20
2720010 PDS	Calcium	08/16/2022 13:47:44	94.2	57.2	mg/L	100	151.4	94.2				75	125	
2720010 PDSD	Calcium	08/16/2022 13:49:47	93.8	57.2	mg/L				151	93.8	0.27	75	125	20
LFB-MI	Calcium	08/16/2022 14:01:19	106		mg/L	100	106.1	106				85	115	
LFB-MI	Calcium		107		mg/L	100	106.7	107				85	115	
LFB-MI	Calcium	08/16/2022 11:49:11	109		mg/L	100	109.4	109				85	115	
MB	Calcium		<1		mg/L									
MB	Calcium		<1		mg/L									
MB	Calcium		<1		mg/L									
2718009 MS	Chloride	08/17/2022 11:55:53		21.0	mg/L	30	49.6	95.3				80	120	
2718009 MSD	Chloride	08/17/2022 11:57:04		21.0	mg/L				49.3	94.3	0.61	80	120	20
2720008 MS	Chloride		123	105	mg/L	30	142	123		22		80	120	
2720008 MSD	Chloride		123	105	mg/L				142	123	0.00	80	120	20
2788001 MS	Chloride	08/17/2022 14:29:58		86.2	mg/L	30	124	125	· . _	0	0.00	80	120	_0
2788001 MSD	Chloride	08/17/2022 14:31:09		86.2	mg/L			0	124	127	0.00	80	120	20
2788010 MS	Chloride	08/17/2022 14:59:04		17.2	mg/L	30	43.5	87.5				80	120	
2788010 MSD	Chloride	08/17/2022 15:00:15		17.2	mg/L				43.9	88.9	0.92	80	120	20
LFB	Chloride	08/17/2022 11:21:36			mg/L	30	27.4	91.2	.0.0	00.0	0.02	90	110	_0
LFB	Chloride	08/17/2022 11:35:48			mg/L	30	27.3	91				90	110	
LFB	Chloride	08/17/2022 11:59:25			mg/L	30	27.2	90.7				90	110	
LFB	Chloride	08/17/2022 12:15:58			mg/L	30	27.2	90.6				90	110	
LFB	Chloride	08/17/2022 12:34:53			mg/L	30	27.1	90.3				90	110	
LFB	Chloride	08/17/2022 14:14:36			mg/L	30	27.2	90.5				90	110	
LFB	Chloride	08/17/2022 14:37:08			mg/L	30	29.6	98.6				90	110	
LFB	Chloride	08/17/2022 15:02:37			mg/L	30	29.6	98.6				90	110	
MB	Chloride	08/17/2022 14:32:20			mg/L	00	20.0	00.0				00	110	
MB	Chloride	08/17/2022 14:13:25			mg/L									
MB	Chloride	08/17/2022 12:33:43			mg/L									
MB	Chloride	08/17/2022 12:14:48			mg/L									
MB	Chloride	08/17/2022 12:14:40			mg/L									
MB	Chloride	08/17/2022 15:01:26												
MB	Chloride	08/17/2022 13:01:26			mg/L mg/L									
MB	Chloride	08/17/2022 11:34:37												
мв 2721001 MS-F	Fluoride	08/17/2022 11:16:53		1 1 1	mg/L	0.5	1.54	00				٥٨	120	
2721001 MS-F 2721001 MSD-F	Fluoride	08/12/2022 14:52:17		1.14 1.14	mg/L	0.5	1.04	80	1.57	86	1.93	80 80	120	20
				1.14	mg/L	2.20	2.25	00.0	1.37	OU	1.33			20
CRM-F	Fluoride	08/12/2022 12:46:00			mg/L	3.39	3.35	98.8				83.8	111	
LFB-F	Fluoride	08/12/2022 12:59:02			mg/L	0.5	0.5	100				90	110	
LFB-F	Fluoride	08/12/2022 18:18:32	102		mg/L	0.5	0.51	102				90	110	

MB-F	Fluoride	08/12/2022 12:52:34	<0.1		mg/L									·
MB-F	Fluoride	08/12/2022 18:12:13			mg/L									
2718001 MS	Sulfate	08/17/2022 09:07:49	107	116	mg/L	500	652	107				85	115	
2718001 MSD	Sulfate	08/17/2022 09:16:38	103	116	mg/L				630	103	3.43	85	115	20
2718011 MS	Sulfate	08/17/2022 09:28:48	94.2	259	mg/L	500	730	94.2				85	115	
2718011 MSD	Sulfate	08/17/2022 09:29:53	96.1	259	mg/L				739	96.1	1.22	85	115	20
2720001 MS	Sulfate	08/17/2022 09:46:27	83.3	262	mg/L	500	679	83.3				85	115	
2720001 MSD	Sulfate	08/17/2022 09:47:33	83.4	262	mg/L				679	83.4	0.00	85	115	20
2720010 MS	Sulfate	08/17/2022 10:06:19	91	128	mg/L	200	310	91				85	115	
2720010 MSD	Sulfate	08/17/2022 10:07:25	91.6	128	mg/L				311	91.6	0.32	85	115	20
2721001 MS	Sulfate	08/17/2022 10:29:22	87.9	7280	mg/L	5000	11700	87.9				85	115	
2721001 MSD	Sulfate	08/17/2022 10:30:28	87.8	7280	mg/L				11700	87.8	0.00	85	115	20
LFB	Sulfate	08/17/2022 09:13:20	100		mg/L	100	100	100				85	115	
LFB	Sulfate	08/17/2022 08:52:22	102		mg/L	100	102	102				85	115	
LFB	Sulfate	08/17/2022 09:32:05	98.6		mg/L	100	98.6	98.6				85	115	
LFB	Sulfate	08/17/2022 09:50:51	94.7		mg/L	100	94.7	94.7				85	115	
LFB	Sulfate	08/17/2022 10:09:37	96.6		mg/L	100	96.6	96.6				85	115	
LFB	Sulfate	08/17/2022 10:22:54	90.5		mg/L	100	90.5	90.5				85	115	
MB	Sulfate	08/17/2022 10:31:34	<5		mg/L									
MB	Sulfate	08/17/2022 10:08:31	<5		mg/L									
MB	Sulfate	08/17/2022 09:49:45	<5		mg/L									
MB	Sulfate	08/17/2022 09:12:14	<5		mg/L									
MB	Sulfate	08/17/2022 08:54:35	<5		mg/L									
MB	Sulfate	08/17/2022 09:30:59	<5		mg/L									
2722007 DUP	Total Dissolved Solids	08/12/2022 14:45:00	294000	288000	mg/L						2.06			20
2722008 DUP	Total Dissolved Solids	08/12/2022 14:45:00	318000	321000	mg/L						0.94			20
CRM	Total Dissolved Solids	08/12/2022 14:45:00	101		mg/L	736	744	101				90.35	110.33	
MB	Total Dissolved Solids	08/12/2022 14:45:00	<10		mg/L									



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RFV1

Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Fall 2022 (4467) **PO:** 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Unreported samples to correct field summary report attached to workorder, collection dates for field blank and field duplicate. CC 30Nov22

Sample Comments

4467003 (Dup 1) - Sample

Time sampled was not supplied by the client.

4467004 (Field Blank) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

4467001 (MW13)

Sample analyzed beyond holding time.(pH)

4467002 (MW80R)

Sample analyzed beyond holding time.(pH)

4467003 (Dup 1)

Sample analyzed beyond holding time.(pH)

4467004 (Field Blank)

Sample analyzed beyond holding time.(pH)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467001Date Collected:10/17/2022 12:30Matrix:GroundwaterSample ID:MW13Date Received:10/19/2022 08:20Collector:MVTL Field Service

10/17/2022 10/17/2022 JSM 12:30 12:30 JSM	ert Qua
12:30 12:30 JSM	
Prepared Analyzed By 0	
Prepared Analyzed By (
	ert Qua
10/17/2022 10/17/2022 12:30 12:30 JSM	
Prepared Analyzed By (ert Qua
10/17/2022 10/17/2022 12:30 12:30 JSM	
Prepared Analyzed By (ert Qua
10/26/2022 10/26/2022 09:49 09:49 EJV M	1A,NDA
Prepared Analyzed By (ert Qua
10/19/2022 10/27/2022 SLZ M 16:41 10:51	1A,NDA
10/19/2022 10/25/2022	IA,NDA
Prepared Analyzed By (ert Qua
10/20/2022 10/20/2022 RAA M 17:29 17:29	IA,NDA *
	ert Qua
Prepared Analyzed By (o wuu
10/26/2022 10/26/2022	IA,NDA
10/26/2022 10/26/2022	
10/26/2022 10/26/2022 EJV M 12:28 12:28	
	С

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467001
 Date Collected:
 10/17/2022 12:30
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	10600	mg/L	10	1	10/21/2022 09:40	10/21/2022 09:40	RAA	MA,NDA	





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	5892	umhos/cm	1	1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.05	units	0.01	1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	9.87	degrees C		1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: ASTM D516-16									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	3460	mg/L	200	40	10/26/2022 09:57	10/26/2022 09:57	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.5	mg/L	0.5	5	10/19/2022 16:41	10/27/2022 10:56	SLZ	MA,NDA	
Calcium	418	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.6	units	0.1	1	10/20/2022 19:02	10/20/2022 19:02	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Parameter					10/26/2022	10/26/2022			
Parameter Chloride	149	mg/L	2.0	1	12:29	12:29	EJV	MA,NDA	
		mg/L	2.0	1			EJV	MA,NDA	
Chloride		mg/L Units	2.0 RDL	1 DF			EJV By	MA,NDA Cert	Qual

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	6310	mg/L	10	1	10/21/2022 09:40	10/21/2022 09:40	RAA	MA,NDA	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467003Date Collected:10/17/2022Matrix:GroundwaterSample ID:Dup 1Date Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6700	mg/L	250	50	10/26/2022 09:58	10/26/2022 09:58	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.62	mg/L	0.5	5	10/19/2022 16:41	10/27/2022 10:58	SLZ	MA,NDA	
Calcium	409	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:49	SLZ	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.2	units	0.1	1	10/20/2022 14:36	10/20/2022 14:36	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	71.8	mg/L	2.0	1	10/26/2022 12:30	10/26/2022 12:30	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.84	mg/L	0.1	1	10/20/2022 14:36	10/20/2022 14:36	RAA		
Method: USGS I-1750-85									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467004Date Collected:10/18/2022Matrix:GroundwaterSample ID:Field BlankDate Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	<5	mg/L	5	1	10/26/2022 09:59	10/26/2022 09:59	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.1	mg/L	0.1	1	10/19/2022 16:41	10/27/2022 11:00	SLZ	MA,NDA	
Calcium	<1	mg/L	1	1	10/19/2022 16:41	10/25/2022 13:50	SLZ	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	6.3	units	0.1	1	10/20/2022 12:21	10/20/2022 12:21	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	<2.0	mg/L	2.0	1	10/26/2022 12:31	10/26/2022 12:31	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	<0.1	mg/L	0.1	1	10/20/2022 12:21	10/20/2022 12:21	RAA		
Method: USGS I-1750-85									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

10/21/2022

09:40

10/21/2022

09:40

RAA

MA,NDA

10

mg/L

1

<10

Total Dissolved Solids



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	2616 E. Br	ota Valley To roadway Ave . ND 58501 9720	esting L	aborate	ories	5		WO	: 4467	Unillies - E	is.	Cha	nin of Custody Record
Report To:	MDU			CC:						Project N	ame:		MDU Heskett
	Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427								Event: Sampled	Bur		Fall 2022	
	Todd.Peterson@mdu.c	om								Sampled	ъу.	Jeny	2
	Sam	ple Information	n		I.L.		Sample Conta	ainers		Field Re	eadings		
Phone: Email:	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HNO3	500 mL H2504 250 mL H2504		Temp (°C)	Spec. Cond.	На	Turbidity (NTU)	Analysis Required
001	MW13	170012	1230	GW			x x		8.73	9773	7.03	0.57	
_	MW1-90	180ct22	1205	GW			x x x		Droj				
-	MW2-90	1800tzs	1202	GW			x x x		Dry				
	MW3-90	180c+22	1158	GW	-	_	x	+	Dry		-	1	MDU Heskett List
002	MW80R	170ct22	1543	GW	-	-	x x		9.87	5892	7.05	1.15	THE O THUMBER EIGH
003	Dup 1	170cf22	NA	GW	-	-	x x	+++	NA	MA	NA	NA	
004	Field Blank (FB)	180et 22	NA	GW	X	X	x x		NA	NA	NA	NA	

Sample Condition

Log In Walk In #2 Temp (°C)

TM562/TM805

Received By

Date/Time

1900122

Relinquished By

Date/Time

19 Oct 4

0800

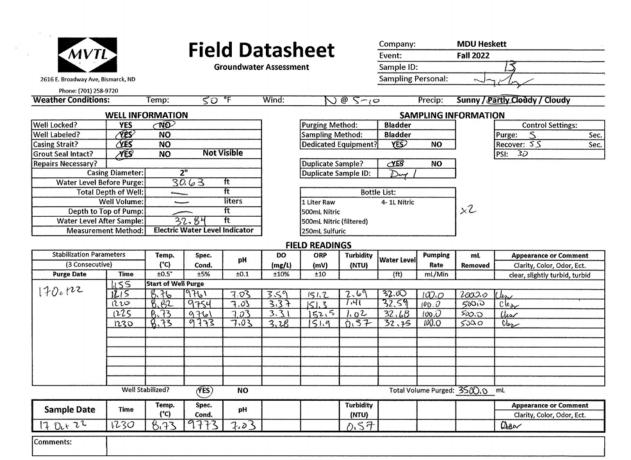


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

AAVIT			Fial	y Da	tack	neet	Company:		MDU Hes	kett
MVTI	->		1 161	uD	itasi	ieet	Event:		Fall 2022	
			Gr	oundwate	r Assessm	ent	Sample ID	:		1-90,
2616 E. Broadway Ave, Bi	ismarck, ND						Sampling I	Personal:	-	Jarlin_
Phone: (701) 258-										, , ,
Veather Conditions	s:	Temp:		°F	Wind:	@		Precip:	Sunny / Pa	artly Cloudy / Cloudy
	WELL INFO	DRMATIO	N				SAN	IPLING IN	FORMATI	ON
Vell Locked?	YES	NO	-		1	Purging Method:	Bladder]	Control Settings:
Vell Labeled?	YES	NO			1	Sampling Method:	Bladder		1	Purge:
asing Strait?	YES	NO			1	Dedicated Equipment	? (YES)	NO	1	Recover:
rout Seal Intact?	YES	NO	Not V	isible/	1				•	PSI:
epairs Necessary?]	Duplicate Sample?	YES	(NØ	1	
	g Diameter:		2"]	Duplicate Sample ID:		-]	
Water Level Be		Below	Piny	ft]					
	pth of Well:		- (ft]		le List:		l	
	/ell Volume:			liters	1	1 Liter Raw	4- 1L Nitric			
	op of Pump:	14.4	8	ft	1	500mL Nitrie				
Water Level Af				ft	1	500mL Nitric (filtered)			1	
Measureme	ent Method:	Electric \	Nater Level	Indicator	1	250mL Sulfuric			ı	
					J	250mc Sandric	_		1	
					FIE	LD READINGS			J	
Stabilization Parar		Temp.	Spec.		FIE		Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	ve)	Temp. (°C)	Spec. Cond.	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)	Water Level	Rate	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%		DO	LD READINGS ORP Turbidity	Water Level			
(3 Consecutiv	ve) Time	Temp. (°C)	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)	(ft)	Rate	Removed	Clarity, Color, Odor, Ect.
(3 Consecutive Purge Date	Well Sta	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5% I Purge	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
(3 Consecutiv	Time	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5% I Purge	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10 Turbidity	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid mL Appearance or Comment
(3 Consecutive Purge Date	Well Sta	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5% Purge YES Spec.	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid

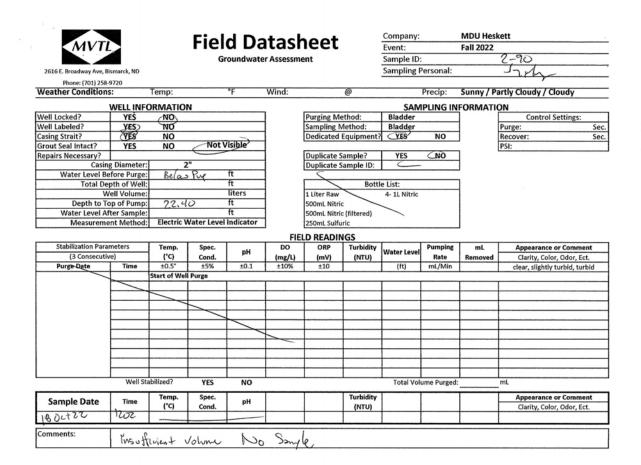


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck







Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTI	2		riei	a Da	atasi	neet		Company: Event:		Fall 2022	***************************************
	4		G	roundwate	er Assessm	ent		Sample ID:			3-90
2616 E. Broadway Ave, Bi	smarck, ND							Sampling F	Personal:		Jack
Phone: (701) 258-9	9720										1
Weather Conditions	:	Temp:		°F	Wind:		@		Precip:	Sunny / P	artly Cloudy / Cloudy
	WELL INFO	DRMATIO	N					SAM	PLING IN	FORMATI	ON
Well Locked?	YES	(NO)			7	Purging Met	thod:	Bladder]	Control Settings:
Well Labeled?	¥ES"	NO			1	Sampling M		Bladder		1	Purges Se
Casing Strait?	YES	NO			1	Dedicated E	quipment	(YES)	NO	1	Recover: Se
Grout Seal Intact?	YES	NO	Not	Fisible	1					•	PSI:
Repairs Necessary?					1	Duplicate Sa	mple?	YES	NO	1	
Casing	Diameter:	2			1	Duplicate Sa		-	-	1	
Water Level Be	fore Purge:	Below	Pine	ft	1					•	
Total Dep	oth of Well:		1	ft			Bott	le List:]	
W	ell Volume:			liters		1 Liter Raw	_	4- 1L Nitric		1	
Depth to To	p of Pump:	20,7	22	ft		500mL Nitric				1	
Water Level Af	ter Sample:			ft		500mL Nitric	(filtered)				
Measureme	nt Method:	Electric V	Vater Level	Indicator		250mL Sulfur	ic				
					 FIE	LD READIN	GS				
Stabilization Parar	neters	Temp.	Spec.	рН	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	e)	(°C)	Cond.	PH	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5*	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
_		Start of Wel	l Purge								
	/										
	Well Sta	abilized?	YES	NO				Total Vol	ume Purged:		_mL
Sample Date	Time	Temp.	Spec.	pH	T		Turbidity	T			Appearance or Comment
		(°C)	Cond.	pn			(NTU)				Clarity, Color, Odor, Ect.
160122	1158	_									
Comments:	insuff										





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

1417	7		Fiel	d Da	tack	neet		Company:		MDU Hes	kett	
MVT	L,		1161	u Do	itasi	ieet		Event:		Fall 2022		
			Gr	oundwate	r Assessm	ent		Sample ID:			BOR,	
2616 E. Broadway Ave,	Bismarck, ND							Sampling P	ersonal:		Jack	
Phone: (701) 258	3-9720											
Weather Condition	is:	Temp:	60	°F	Wind:	N	@ 5-16	0	Precip:	Sunny / P	artly Cloudy / Cloud	у
	WELL INFO	RMATIO	N					SAM	PLING IN	FORMATI	ON	
Well Locked?	YES	NO			1	Purging Me	thod:	Bladder		1	Control Settin	ngs:
Well Labeled?	₹ES>	NO			1	Sampling N	lethod:	Bladder		1	Purge: ろ	Sec.
Casing Strait?	CYES.	NO			1	Dedicated	Equipment?	(YES)	NO	1	Recover:55	Sec.
Grout Seal Intact?	YES	NO	Not V	isible/							PSI: 2.0	
Repairs Necessary?						Duplicate S		YES	< NO]		
	ng Diameter:		2"			Duplicate S	ample ID:	-	-]		
Water Level B		15.		ft								
	epth of Well:	_		ft	1		Bottl	e List:				
	Well Volume:			liters		1 Liter Raw		4- 1L Nitric				
	op of Pump:			ft	1	500mL Nitrie						
Water Level A		15,	<u>じし</u> Water Level		-	500mL Nitrie						
Measurem	ent Method:	Electric	water Level	indicator	J	250mL Sulfu	ric			J		
				7 %	FIE	LD READIN	IGS					
Stabilization Par		Temp.	Spec.	рН	DO	ORP	Turbidity	Water Level	Pumping	mL.	Appearance or Co	mment
(3 Consecut	<u></u>	(°C)	Cond.		(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, Od	
	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbi	d, turbid
Purge Date												
Purge Date	1508	Start of We		7		00.5	1 = 5	100.0	1.50	100000		
	150B 152B	9,91	5887	7.04	0.22	89.7	1,35	15.68	100.0	2000.0	Clear	
Purge Date	1508 1528 1533	9,91 9,88	5887- 5885	7.04	0,21	80.7	1.34	15.71	100.00	50.0	Clear	
Purge Date	1508 1528 1533 1538	9,91 9,88 9,98	5887 5885 5886	7.09	0,21	76.9	1.05	15.73	1000	50.0 50.0	Clear	
Purge Date	1508 1528 1533	9,91 9,88	5887- 5885	7.04	0,21	80.7	1.34	15.71	100.00	50.0	Clear	
Purge Date	1508 1528 1533 1538	9,91 9,88 9,98	5887 5885 5886	7.09	0,21	76.9	1.05	15.73	1000	50.0 50.0	Clear	
Purge Date	1508 1528 1533 1538	9,91 9,88 9,98	5887 5885 5886	7.09	0,21	76.9	1.05	15.73	1000	50.0 50.0	Clear	
Purge Date	1508 1528 1533 1538	9,91 9,88 9,98	5887 5885 5886	7.09	0,21	76.9	1.05	15.73	1000	50.0 50.0	Clear	
Purge Date	1508 1528 1533 1538	9,91 9,88 9,98	5887 5885 5886	7.09	0,21	76.9	1.05	15.73	1000	50.0 50.0	Clear	

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Turbidity

(NTU)

Appearance or Comment

Clarity, Color, Odor, Ect.

Temp (°C)

1543

Cond.

7.05

Sample Date

17 Octre

Comments:



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2800 Client: Montana-Dakota Utilities - Bismarck Account #:

@ CC 30NOV22



Field Datasheet

MDU Lewis & Clark HOSKOH Company: Event: Fall 2022 Sampling Personal:

Phone: (701) 258-9720

Weather Conditions:	Temp:		°F	Wind:	 @ F	Precip: Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Comments
MW70		1437	2"	22.50		
MW33		1456	2"	44.10		
MW101		1440	2"	38,50		
MW102	(70422	1434	2"	19,28		
MW103	(400.	1445	2"	35,68		
MW44R		1450	2"	28,91		
MW104		1500	2"	15,54		
MW105		1503	2"	13,53		

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MINNESOTA VALLEY TESTING LABORATORIES, INC.

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October 20, 2022

Montana-Dakota Utilities Todd Peterson 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From October 17-18, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 2 of the 5 wells. Wells 1-90, 2-90, and 3-90 were found to be dry during this sample event. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

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

Original Sample QC Type	Analyte	Analysis Date	QC Result	Original Sa	mple Re Units	Spike Amoı Sp	oike Resu Spil	κe % RecovιSpi	ke Duplicate Spik	e Duplicate RPD	(%) Lower	Control Limi Upper (Control Limit RPD L	_imit (%)
4311001 PDS	Boron	10/27/2022 10:41:00	110	<1	mg/L	4	4.387	110				75	125	
4311001 PDSD	Boron	10/27/2022 10:43:00	111	<1	mg/L				4.427	111	0.91	75	125	20
4467001 PDS	Boron	10/27/2022 10:52:00	88.8	0.57	mg/L	2	2.344	88.8				75	125	
4467001 PDSD	Boron	10/27/2022 10:54:00	93.5	0.57	mg/L				2.439	93.5	3.97	75	125	20
4467004 MS	Boron	10/27/2022 11:02:37	97.8	<0.1	mg/L	0.4	0.3911	97.8				70	130	
4467004 MSD	Boron	10/27/2022 11:04:27	99.6	<0.1	mg/L				0.3985	99.6	1.87	70	130	20
4506005 MS	Boron	10/27/2022 11:25:06	118	<0.1	mg/L	0.4	0.4718	118				70	130	
4506005 MSD	Boron	10/27/2022 11:26:57	116	<0.1	mg/L				0.4623	116	2.03	70	130	20
LFB-OE	Boron	10/27/2022 10:49:14	98.9		mg/L	0.4	0.3955	98.9				85	115	
LFB-OE	Boron	10/27/2022 10:37:47	99		mg/L	0.4	0.3961	99				85	115	
MB	Boron	10/27/2022 10:35:50	<0.1		mg/L									
MB	Boron	10/27/2022 10:47:14	<0.1		mg/L									
4049002 PDS	Calcium	10/25/2022 12:08:18	101	64.7	mg/L	100	166	101				75	125	
4049002 PDSD	Calcium	10/25/2022 12:09:06	101	64.7	mg/L				165.5	101	0.30	75	125	20
4278001 PDS	Calcium	10/25/2022 12:25:24	93.5		mg/L	100	219.6	93.5				75	125	
4278001 PDSD	Calcium	10/25/2022 12:26:11	96.2		mg/L				222.3	96.2	1.22	75	125	20
4283001 PDS	Calcium	10/25/2022 12:48:41	97.5	41.8	mg/L	100	139.3	97.5				75	125	
4283001 PDSD	Calcium	10/25/2022 12:49:31	97.7	41.8	mg/L				139.5	97.7	0.14	75	125	20
4284001 PDS	Calcium	10/25/2022 12:55:26	103	1.78	mg/L	100	104.4	103				75	125	
4284001 PDSD	Calcium	10/25/2022 12:56:29	104	1.78	mg/L				105.3	104	0.86	75	125	20
4311001 PDS	Calcium	10/25/2022 13:10:00	105	24.6	mg/L	1000	1072	105				75	125	
4311001 PDSD	Calcium	10/25/2022 13:11:00	104	24.6	mg/L				1061	104	1.03	75	125	20
4448001 DUP	Calcium	10/25/2022 13:13:23	220.6	221	mg/L						0.18			20
4458008 DUP	Calcium	10/25/2022 13:22:52	492.5	488	mg/L						0.92			20
4458009 PDS	Calcium	10/25/2022 13:24:00	98.9	294	mg/L	500	788	98.9				75	125	
4458009 PDSD	Calcium	10/25/2022 13:25:00	99.9	294	mg/L				793.3	99.9	0.67	75	125	20
4458014 DUP	Calcium	10/25/2022 13:32:17	122.1	117	mg/L						4.26			20
4458021 PDS	Calcium	10/25/2022 13:40:35	102	8.08	mg/L	100	109.7	102				75	125	
4458021 PDSD	Calcium	10/25/2022 13:41:32	102	8.08	mg/L				110.1	102	0.36	75	125	20
4467002 DUP	Calcium	10/25/2022 13:48:43	437.9	418	mg/L						4.65			20
4470001 DUP	Calcium	10/25/2022 13:51:59	129.2	132	mg/L						2.14			20
4470002 PDS	Calcium	10/25/2022 13:53:32	95.3	104	mg/L	100	199.8	95.3				75	125	
4470002 PDSD	Calcium	10/25/2022 13:54:25	95.7	104	mg/L				200.2	95.7	0.20	75	125	20
4477001 PDS	Calcium	10/25/2022 13:58:22	102		mg/L	100	105.7	102				75	125	
4477001 PDSD	Calcium	10/25/2022 13:59:23	102		mg/L				106.1	102	0.38	75	125	20
4506006 DUP	Calcium	10/25/2022 14:06:43	47.55	47.7	mg/L						0.31			20
LFB-MI	Calcium	10/25/2022 13:08:42	106		mg/L	100	105.7	106				85	115	
LFB-MI	Calcium	10/25/2022 13:36:29	106		mg/L	100	106.3	106				85	115	
MB	Calcium	10/25/2022 13:07:50	<1		mg/L									
MB	Calcium	10/25/2022 13:35:37	<1		mg/L									
4479001 MS	Chloride	10/26/2022 12:38:48	116	96.1	mg/L	30	131	116				80	120	
4479001 MSD	Chloride		116	96.1	mg/L				131	116	0.00	80	120	20
4519004 MS	Chloride	10/26/2022 14:30:22		5.3	mg/L	30	33.5	94				80	120	
4519004 MSD	Chloride	10/26/2022 14:31:34		5.3	mg/L				33.5	94.1	0.00	80	120	20
4594001 MS	Chloride	10/26/2022 15:05:50		4.5	mg/L	30	34.9	101				80	120	

4594001 MSD	
LFB Chloride 10/26/2022 12/23/25 92.8 mg/L 30 27.8 92.8 92.8 92.8 92.8 92.8 92.8 92.8 92	20
LFB Chloride 10/26/2022 14:42:20 91.5 mg/L 30 27.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91	
FB	
FB	
FB	
LFB Chloride 10/26/2022 14:50:28 92.5 mg/L 30 27.7 92.5 93.5 93.5 93.5 93.5 93.5 93.5 93.5 93	
LFB Chloride 10/26/2022 15:10:33 93.5 mg/L 30 28 93.5	
MB Chloride 10/26/2022 12:05:41	
MB Chloride 10/26/2022 12:22:15 < 2.0 mg/L MB Chloride 10/26/2022 12:41:09 < 2.0 mg/L MB Chloride 10/26/2022 15:09:22 < 2.0 mg/L MB Chloride 10/26/2022 14:32:44 < 2.0 mg/L MB Chloride 10/26/2022 14:49:17 < 2.0 mg/L MB Chloride 10/26/2022 14:49:17 < 2.0 mg/L MB Chloride 10/26/2022 14:13:50 < 2.0 mg/L MB Chloride 10/26/2022 14:49:17 < 2.0 mg/L MB Chloride 10/26/2022 14:13:50 < 2.0 mg/L 4467001 MS-F Fluoride 10/26/2022 14:13:50 < 2.0 mg/L 4467001 MS-F Fluoride 10/20/2022 17:45:15 96 0.84 mg/L 0.5 1.32 96	
MB Chloride 10/26/2022 12:41:09 < 2.0 mg/L MB Chloride 10/26/2022 15:09:22 < 2.0 mg/L MB Chloride 10/26/2022 14:32:44 < 2.0 mg/L MB Chloride 10/26/2022 14:32:44 < 2.0 mg/L MB Chloride 10/26/2022 14:49:17 < 2.0 mg/L 4467001 MS-F Fluoride 10/26/2022 17:45:15 96 0.84 mg/L 4467001 MS-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 447002 MS-F Fluoride 10/20/2022 17:55:17 128 < 0.1 mg/L 447002 MS-F Fluoride 10/20/2022 12:52:57 128 < 0.1 mg/L 447002 MS-F Fluoride 10/20/2022 12:58:54 128 < 0.1 mg/L 44555001 MS-F Fluoride 10/20/2022 12:58:54 128 < 0.1 mg/L 4555001 MS-F Fluoride 10/20/2022 13:17 106 0.29 mg/L 4555001 MS-F Fluoride 10/20/2021 13:17 106 0.29 mg/L 4555001 MS-F Fluoride 10/20/2021 15:05 100 mg/L 4555001 MS-F Fluoride 10/20/20 31:19:01 110 0.29 mg/L 455001 MS-F Fluoride 10/20/20 31:19:01 110 0.29 mg/L 455001 MS-F Fluoride 10/20/20 31:19:01 110 0.29 mg/L	
MB Chloride 10/26/2022 15:09:22 <2.0 mg/L MB Chloride 10/26/2022 14:32:44 <2.0 mg/L MB Chloride 10/26/2022 14:49:17 <2.0 mg/L 4467001 MS-F Fluoride 10/26/2022 17:45:15 96 0.84 mg/L 4467001 MS-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 447002 MS-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 447002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 447002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 447002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 4555001 MS-F Fluoride 10/20/2022 13:17 106 0.29 mg/L 4555001 MS-F Fluoride 10/20/2021 13:17 106 0.29 mg/L 4555001 MS-F Fluoride 10/20/2022 13:57:00 102 mg/L 4555001 MS-F Fluoride 10/20/2022 13:57:00 102 mg/L 4555001 MS-F Fluoride 10/20/2022 13:57:00 102 mg/L	
MB Chloride 10/26/2022 14:32:44 <2.0 mg/L MB Chloride 10/26/2022 14:49:17 <2.0 mg/L MB Chloride 10/26/2022 14:13:50 <2.0 mg/L 4467001 MS-F Fluoride 10/20/2022 17:45:15 96 0.84 mg/L 4467001 MSD-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 447002 MS-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 447002 MSD-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 447002 MSD-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 4555001 MS-F Fluoride 10/20/2022 12:52:	
MB Chloride 10/26/2022 14:49:17 < 2.0 mg/L MB Chloride 10/26/2022 14:13:50 < 2.0 mg/L 4467001 MS-F Fluoride 10/20/2022 17:45:15 96 0.84 mg/L 4467001 MSD-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 4470002 MS-F Fluoride 10/20/2022 12:52:57 128 < 0.1 mg/L 4470002 MSD-F Fluoride 10/20/2022 12:52:57 128 < 0.1 mg/L 4470002 MSD-F Fluoride 10/20/2022 12:58:54 128 < 0.1 mg/L 4555001 MS-F Fluoride 10/20/2022 12:58:54 128 < 0.1 mg/L 4555001 MSD-F Fluoride 10/20/2022 12:58:54 128 < 0.1 mg/L 4555001 MSD-F Fluoride 10/21/2022 03:13:17 106 0.29 mg/L 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 4555001 MSD-F Fluoride 10/20/2022 10:57:00 102 mg/L	
MB Chloride 10/26/2022 14:13:50 <2.0 mg/L 4467001 MS-F Fluoride 10/20/2022 17:45:15 96 0.84 mg/L 0.5 1.32 96	
4467001 MS-F Fluoride 10/20/2022 17:45:15 96 0.84 mg/L 0.5 1.32 96 1.31 94 0.76 80 120 4467001 MSD-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 5 0.64 128 0.76 80 120 4470002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1	
4467001 MSD-F Fluoride 10/20/2022 17:51:14 94 0.84 mg/L 1.31 94 0.76 80 120 4470002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1	
4470002 MS-F Fluoride 10/20/2022 12:52:57 128 <0.1 mg/L 0.5 0.64 128 <0.64 128 0.00 80 120 4470002 MSD-F Fluoride 10/20/2022 12:58:54 128 <0.1 mg/L 0.5 0.82 106 128 0.00 80 120 4555001 MS-F Fluoride 10/21/2022 03:13:17 106 0.29 mg/L 0.5 0.82 106 106 120 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 5.0 0.82 106 10.84 110 2.41 80 120 CRM-F Fluoride 10/20/2022 10:57:00 102 mg/L 3.39 3.45 102 5.0 83.8 111	22
4470002 MSD-F Fluoride 10/20/2022 12:58:54 128 <0.1 mg/L 0.64 128 0.00 80 120 4555001 MS-F Fluoride 10/21/2022 03:13:17 106 0.29 mg/L 0.5 0.82 106 0.84 110 2.41 80 120 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 0.84 110 2.41 80 120 CRM-F Fluoride 10/20/2022 10:57:00 102 mg/L 3.39 3.45 102 5.83 111	20
4555001 MS-F Fluoride 10/21/2022 03:13:17 106 0.29 mg/L 0.5 0.82 106 80 120 4555001 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 0.84 110 2.41 80 120 CRM-F Fluoride 10/20/2022 10:57:00 102 mg/L 3.39 3.45 102 83.8 111	
455501 MSD-F Fluoride 10/21/2022 03:19:01 110 0.29 mg/L 0.84 110 2.41 80 120 CRM-F Fluoride 10/20/2022 10:57:00 102 mg/L 3.39 3.45 102 83.8 111	20
CRM-F Fluoride 10/20/2022 10:57:00 102 mg/L 3.39 3.45 102 83.8 111	
	20
LFB-F Fluoride 10/20/2022 15:25:16 100 mg/L 0.5 0.5 100 90 110	
LFB-F Fluoride 10/20/2022 20:44:49 100 mg/L 0.5 0.5 100 90 110	
LFB-F Fluoride 10/20/2022 11:10:18 104 mg/L 0.5 0.52 104 90 110	
LFB-F Fluoride 10/21/2022 01:13:30 104 mg/L 0.5 0.52 104 90 110	
LFB-F Fluoride 10/21/2022 05:23:54 102 mg/L 0.5 0.51 102 90 110	
MB-F Fluoride 10/20/2022 11:03:51 <0.1 mg/L	
MB-F Fluoride 10/21/2022 05:17:36 <0.1 mg/L	
MB-F Fluoride 10/21/2022 01:07:12 <0.1 mg/L	
MB-F Fluoride 10/20/2022 20:38:31 <0.1 mg/L	
MB-F Fluoride 10/20/2022 15:18:57 <0.1 mg/L	
4458002 MS Sulfate 10/26/2022 09:08:52 92.9 5640 mg/L 5000 10300 92.9 85 115	
4458002 MSD Sulfate 10/26/2022 09:09:57 93.1 5640 mg/L 10300 93.1 0.00 85 115	20
4458008 MS Sulfate 10/26/2022 09:35:21 85.7 5660 mg/L 5000 9950 85.7 85 115	
4458008 MSD Sulfate 10/26/2022 09:36:26 85.1 5660 mg/L 9920 85.1 0.30 85 115	20
4458019 MS Sulfate 10/26/2022 09:50:49 96.8 <5 mg/L 100 96.8 96.8 85 115	
4458019 MSD Sulfate 10/26/2022 09:51:55 98.8 <5 mg/L 98.8 98.8 2.04 85 115	20
4483001 MS Sulfate 10/26/2022 10:08:29 97.6 24.0 mg/L 100 122 97.6 85 115	
4483001 MSD Sulfate 10/26/2022 10:09:34 94 24.0 mg/L 118 94 3.33 85 115	20
4519001 MS Sulfate 10/26/2022 10:28:21 94.5 203 mg/L 500 675 94.5 85 115	
4519001 MSD Sulfate 10/26/2022 10:29:27 99.1 203 mg/L 698 99.1 3.35 85 115	20
4519006 MS Sulfate 10/26/2022 10:54:52 92.1 576 mg/L 500 1040 92.1 85 115	20
4519006 MSD Sulfate 10/26/2022 10:55:58 90.9 576 mg/L 1030 90.9 0.97 85 115	20
4519000 MSD Sulfate 10/26/2022 10.35.36 90.9 570 Mg/L 200 258 97.4 85 115	20
·	20
· · · · · · · · · · · · · · · · · · ·	20
4594005 MS Sulfate 10/26/2022 11:32:26 85.4 195 mg/L 200 366 85.4 85.4 15	

4594005 MSD	Sulfate	10/26/2022 11:31:21	88.2	195	mg/L				372	88.2	1.63	85	115	20
LFB	Sulfate	10/26/2022 09:54:07	99.7		mg/L	100	99.7	99.7				85	115	
LFB	Sulfate	10/26/2022 09:30:56	96.1		mg/L	100	96.1	96.1				85	115	
LFB	Sulfate	10/26/2022 09:13:16	98.9		mg/L	100	98.9	98.9				85	115	
LFB	Sulfate	10/26/2022 08:54:30	102		mg/L	100	102	102				85	115	
LFB	Sulfate	10/26/2022 11:34:39	93.4		mg/L	100	93.4	93.4				85	115	
LFB	Sulfate	10/26/2022 10:11:47	98		mg/L	100	98	98				85	115	
LFB	Sulfate	10/26/2022 10:34:57	99.4		mg/L	100	99.4	99.4				85	115	
LFB	Sulfate	10/26/2022 11:01:29	98.8		mg/L	100	98.8	98.8				85	115	
LFB	Sulfate	10/26/2022 11:20:16	90.7		mg/L	100	90.7	90.7				85	115	
MB	Sulfate	10/26/2022 11:40:10	<5		mg/L									
MB	Sulfate	10/26/2022 11:19:10	<5		mg/L									
MB	Sulfate	10/26/2022 10:57:04	<5		mg/L									
MB	Sulfate	10/26/2022 10:47:08	<5		mg/L									
MB	Sulfate	10/26/2022 10:26:09	<5		mg/L									
MB	Sulfate	10/26/2022 09:53:01	<5		mg/L									
MB	Sulfate	10/26/2022 09:29:49	<5		mg/L									
MB	Sulfate	10/26/2022 09:12:10	<5		mg/L									
MB	Sulfate	10/26/2022 08:53:23	<5		mg/L									
4448001 DUP	Total Dissolved Solids	10/21/2022 09:50:37	2490	2520	mg/L						1.20			20
CRM	Total Dissolved Solids	10/21/2022 09:50:37	101		mg/L	736	742	101				90.35	110.33	
MB	Total Dissolved Solids	10/21/2022 09:50:37	<10		mg/L									
4458015 DUP	рН	10/20/2022 16:08:46	7.66	7.6	units						0.79			20
4483001 DUP	рН	10/20/2022 13:21:54	7.31	7.8	units						6.48			20
4519002 DUP	рН	10/20/2022 18:51:08	7.26	7.3	units						0.55			20
4519005 DUP	рН	10/20/2022 22:56:11	7.33	7.4	units						0.95			20
4553001 DUP	рН	10/21/2022 02:27:32		8.8	units						1.72			20
CRM-PH	рН	10/21/2022 05:41:30	98.33		units	6	5.9	98.33				98.33	101.67	
CRM-PH	рН	10/20/2022 16:55:16			units	6	5.9	99				98.33	101.67	
CRM-PH	рН	10/20/2022 15:42:54	99		units	6	5.9	99				98.33	101.67	
CRM-PH	рН	10/21/2022 01:31:04			units	6	5.9	98.67				98.33	101.67	
CRM-PH	рН	10/20/2022 10:27:41			units	6	6	99.67				98.33	101.67	
CRM-PH	рН	10/20/2022 21:02:26	98.5		units	6	5.9	98.5				98.33	101.67	



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

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Fall 2022 (4467) **PO:** 190708 OP

REV1

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Report Date: Tuesday, December 13, 2022 12:59:12 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Unreported samples to correct field summary report attached to workorder, collection dates for field blank and field duplicate. CC 30Nov22

Sample Comments

4467003 (Dup 1) - Sample

Time sampled was not supplied by the client.

4467004 (Field Blank) - Sample

Time sampled was not supplied by the client.





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467001
 Date Collected:
 10/17/2022 12:30
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	11/14/2022 10:30	11/15/2022 10·45	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.573	mg/L	0.1	5	10/19/2022 16:41	10/26/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Barium	0.0067	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Selenium	0.0313	mg/L	0.005	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:00	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	11/14/2022 10:30	11/15/2022 10:45	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.715	mg/L	0.1	5	10/19/2022 16:41	10/26/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Barium	0.0130	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Molybdenum	0.0026	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Selenium	0.0441	mg/L	0.005	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:18	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467003
 Date Collected:
 10/17/2022
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	11/14/2022 10:30	11/15/2022 10:45	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	0.606	mg/L	0.1	5	10/19/2022 16:41	10/26/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Barium	0.0069	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Selenium	0.0322	mg/L	0.005	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:22	MDE	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467004Date Collected:10/18/2022Matrix:GroundwaterSample ID:Field BlankDate Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	11/14/2022 10:30	11/15/2022 10:45	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Lithium	<0.02	mg/L	0.02	1	10/19/2022 16:41	10/26/2022	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Barium	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	10/19/2022 16:41	11/03/2022 13:26	MDE	MA,NDA	

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Report Date: Tuesday, December 13, 2022 12:59:12 PM

Page 6 of 14





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	2616 E. Br	ota Valley To roadway Ave . ND 58501 9720	esting L	aborato	orie	S			WO:	4467	Utilities – B	is.	Cha	nin of Custody Record
Report To:	MDU			CC:							Project Na	ame:		MDU Heskett
Attn: Address:	Bismarck, ND 58501										Event:			Fall 2022
Phone: Email:	701-425-2427 Todd.Peterson@mdu.c	om									Sampled	By:	Jeny	h
	Sam	ple Information	1				Sample Cor	ntainers			Field Re	adings		
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Raw	500 mL HN03	500 mL HNO3 (filtered) 250 mL H2SO4			Temp (°C)	Spec. Cond.	Н	Turbidity (NTU)	Analysis Required
001	MW13	170013	1230	GW	X		x x			8.73	9773	7.03	0.57	
	MW1-90	180ct22	1205	GW			x x x			Droj				
-	MW2-90	1800tzz	1202	GW	X	_	XXX			Dry				
_	MW3-90	180c+22	1158	GW	_	_	X X X			Dry			1	MDU Heskett List
002	MW80R	170ct22	1543	GW	X	-	x x			9.87	5892	7.05	1.15	THE O THUMBER EIGH
003	Dup 1	170ct22	NA	GW	X	-	x x	44		NA	MA	NA	NA	
004	Field Blank (FB)	180et 22	NA	GW	X	Х	X X			NA	NA	NA	NA	

Sample Condition

Log In Walk In #2 Temp (°C)

TM562/TM805

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Received By

Date/Time

1900122

Relinquished By

Date/Time

19 Oct 4

0800

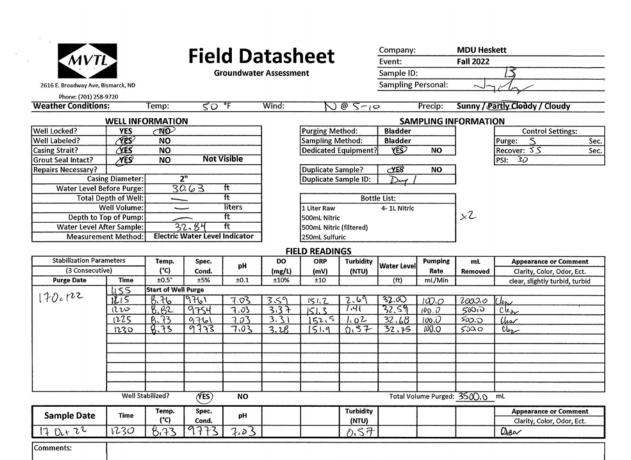


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

AAVIT			Fial	y Da	tack	neet	Company:		MDU Hes	kett
MVTI	->		1 161	u D	itasi	ieet	Event:		Fall 2022	
			Gr	oundwate	r Assessm	ent	Sample ID	:		1-90,
2616 E. Broadway Ave, Bi	ismarck, ND						Sampling I	Personal:	-	Jarlin_
Phone: (701) 258-										, , ,
Veather Conditions	s:	Temp:		°F	Wind:	@		Precip:	Sunny / Pa	artly Cloudy / Cloudy
	WELL INFO	DRMATIO	N				SAN	IPLING IN	FORMATI	ON
Vell Locked?	YES	NO	-		1	Purging Method:	Bladder]	Control Settings:
Vell Labeled?	YES	NO			1	Sampling Method:	Bladder		1	Purge:
asing Strait?	YES	NO			1	Dedicated Equipment	? (YES)	NO	1	Recover:
rout Seal Intact?	YES	NO	Not V	isible/	1				•	PSI:
epairs Necessary?]	Duplicate Sample?	YES	(NØ	1	
	g Diameter:		2"]	Duplicate Sample ID:		-]	
Water Level Be		Below	Piny	ft]					
	pth of Well:		- (ft]		le List:		l	
	/ell Volume:			liters	1	1 Liter Raw	4- 1L Nitric			
	op of Pump:	14.4	8	ft	1	500mL Nitrie				
Water Level After Sample:				ft	1	500mL Nitric (filtered)			1	
Measureme	ent Method:	Electric \	Nater Level	Indicator	1	250mL Sulfuric			ı	
					J	250mc Sandric	_		1	
					FIE	LD READINGS			J	
Stabilization Parar		Temp.	Spec.		FIE		Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	ve)	Temp. (°C)	Spec. Cond.	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)	Water Level	Rate	mL Removed	Appearance or Comment Clarity, Color, Odor, Ect.
	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%		DO	LD READINGS ORP Turbidity	Water Level			
(3 Consecutiv	ve) Time	Temp. (°C)	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (°C) ±0.5°	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)		Rate		Clarity, Color, Odor, Ect.
(3 Consecutiv	ve) Time	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5%	рН	DO (mg/L)	LD READINGS ORP Turbidity (mV) (NTU)	(ft)	Rate	Removed	Clarity, Color, Odor, Ect.
(3 Consecutive Purge Date	Well Sta	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±55% I Purge	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid
(3 Consecutiv	Time	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5% I Purge	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10 Turbidity	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid mL Appearance or Comment
(3 Consecutive Purge Date	Well Sta	Temp. (*C) ±0.5* Start of Wel	Spec. Cond. ±5% Purge	pH ±0.1	DO (mg/L)	DREADINGS ORP Turbidity (mV) (NTU) ±10	(ft)	Rate ml/Min	Removed	Clarity, Color, Odor, Ect. clear, slightly turbid, turbid

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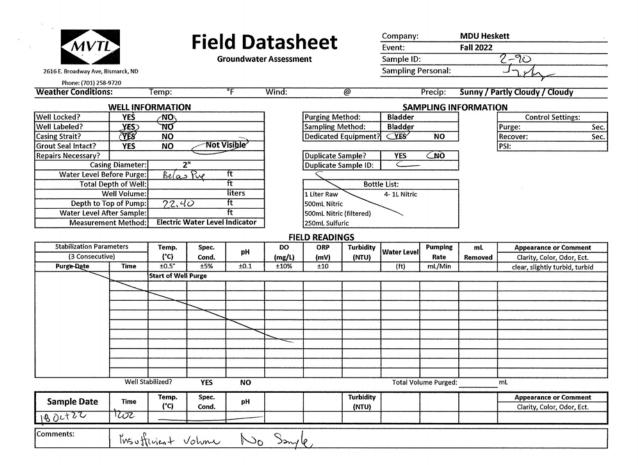


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Report Date: Tuesday, December 13, 2022 12:59:12 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTI			riei	a Da	itasi	neet		Event:		Fall 2022	
	4		G	roundwate	er Assessm	ent		Sample ID:			3-90
2616 E. Broadway Ave, B	ismarck, ND							Sampling P	Personal:		Jack
Phone: (701) 258-	9720										ı
Weather Condition:	s:	Temp:		°F	Wind:		@		Precip:	Sunny / P	artly Cloudy / Cloudy
	WELL INFO	DRMATIO	N					SAM	PLING IN	FORMATI	ON
Well Locked?	YES	ONO			7	Purging Me	thod:	Bladder		1	Control Settings:
Well Labeled?	4ES	NO			1	Sampling M	ethod:	Bladder		1	Purges Se
Casing Strait?	YES	NO			1	Dedicated E	quipment	(YES)	NO	1	Recover: Se
Grout Seal Intact?	YES	NO	Nota	/isible>	1					•	PSI:
Repairs Necessary?					1	Duplicate Sa	ample?	YES	NO]	
Casin	g Diameter:	2	"		7	Duplicate Sa	ample ID:	-	-	1	
Water Level Be	fore Purge:	Below	Pung	ft	7					•	
Total De	pth of Well:		-	ft			Bott	le List:]	
W	ell Volume:			liters	7	1 Liter Raw		4- 1L Nitric		1	
Depth to To	op of Pump:	2015	.2	ft		500mL Nitric					
Water Level Af	ter Sample:			ft		500mL Nitric	(filtered)				
Measureme	nt Method:	Electric V	Vater Level	Indicator		250mL Sulfur	ic				
					FIE	LD READIN	GS				
Stabilization Para	meters	Temp.	Spec.	рН	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecutiv	re)	(°C)	Cond.	pn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
_		Start of Wel	Purge								
		/									
			/								
	Well Sta	abilized?	YES	NO				Total Vol	ume Purged:		mL
Sample Date	Time	Temp.	Spec.	рН			Turbidity				Appearance or Comment
		(°C)	Cond.	pi.		\vdash	(NTU)				Clarity, Color, Odor, Ect.
Boiter	1158										
					Songl						
Comments:											

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTI			Fiel	d Da	atasl	neet		Company: Event:		MDU Hes	kett .
			Gr	oundwate	er Assessm	ent		Sample ID:			BOR,
2616 E. Broadway Ave, B	ismarck, ND							Sampling F	Personal:		Jarly
Phone: (701) 258-				0.5			0.0	/1			
Weather Condition	s:	Temp:	60	4	Wind:	~	@ 5-11		Precip:	Sunny / P	artly Cloudy / Cloudy
	WELL INFO	ORMATIO	N		_			SAM	IPLING IN	FORMATI	ON
Well Locked?	YES	NO				Purging Me		Bladder			Control Settings:
Well Labeled?	YES	NO			1	Sampling N		Bladder		1	Purge: 5 Sec.
Casing Strait?	YES	NO	None	0-11-1-	4	Dedicated	Equipment	(YES)	NO		Recover: SS Sec.
Grout Seal Intact?	(YES)	NO	Not V	/isible	4					1	PSI: 2.0
Repairs Necessary?	Di		. "		4	Duplicate S		YES	<no∙< td=""><td>-</td><td></td></no∙<>	-	
	g Diameter:		2"	ft	-	Duplicate S	ample ID:	_		J	
Water Level Be	pth of Well:	15.		ft	-		Dott	le List:		1	
	ell Volume:		_	liters	-	1 Liter Raw	ВОЦ	4- 1L Nitric		-	
	op of Pump:			ft	-	500mL Nitrie		4- IL NITTIC		l	
Water Level At		15.	21	ft	-	500mL Nitrie				1	
	ent Method:		Water Level		1	250mL Sulfu					
				-1.	FIF	LD READIN				,	
Stabilization Para	meters	Temp.	Spec.	I	DO	ORP	Turbidity	Water Level	Pumping	mL.	Appearance or Comment
(3 Consecutiv	ve)	(°C)	Cond.	pH	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
170c+22	1508	Start of We									
1100	1528	9,91	5887	7.04	0,22	89.7	1,35	15.68	100,0	2000.0	Clear
	1533	9.88	5885	4.04	0,21	80.7	1.34	15.71	1000	500,0	Clear
	1538	9.98	5886	7.05	0.17	76.9	1.05	15.73	1000	50.0	Cles
	1543	4.87	5892	7.05	0.16	75.7	1.15	15,75	100.0	500.0	Clear
			 		-						
			-		-	-		-			
					+	+		-		-	
		-	-	_	+	_		 		 	
	Well Sta	abilized?	(YES)	NO				Total Vol	ume Purged	3500.0	mL
	T	Temp.	Spec.		T	T	Turbidity	T			Appearance or Comment
Sample Date	Time	(°C)	Cond	pH		1	/NITH)	1		1	Clarity Color Odor Ect

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(NTU)

Clarity, Color, Odor, Ect.

Report Date: Tuesday, December 13, 2022 12:59:12 PM

17 Octre Comments:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

@ CC 30NOV22



Field Datasheet

Surface water Assessment

Company: MDU Lewis & Clark Howkelf
Event: Fall 2022

Sampling Personal:

Phone: (701) 258-9720 Weather Conditions: Temp: Wind: @ Precip: Sunny / Partly Cloudy / Cloudy Casing Water Well ID Date Time Comments Diameter Level (ft) 1437 22,50 MW70 2" 44.10 MW33 1456 2" 1440 38,50 MW101 2" MW102 1434 2" 19,28 1445 2" 35,6B MW103 26,91 1450 MW44R 2" 1500 15,54 MW104 2" 1503 13,53 MW105 2"

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MINNESOTA VALLEY TESTING LABORATORIES, INC.

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October 20, 2022

Montana-Dakota Utilities Todd Peterson 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From October 17-18, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 2 of the 5 wells. Wells 1-90, 2-90, and 3-90 were found to be dry during this sample event. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

	Analyte	Analysis Date	QC Result	Original Sample Re	e Units Sp	ike Amol Sp	ike Resu Spike 9	% RecoveSpike [Duplicate Spike D	uplicate RPD (%)	Lower Control L	imi Upper Control	Limit RPD Limit	(%)
4283001 SPK A	Antimony	11/03/2022 10:51:00	100	<0.001	mg/L	0.1	0.1004	100				75	125	
4311001 MS	Antimony	11/03/2022 11:46:46	99.9	0.0079	mg/L	0.4	0.407	99.9				75	125	
4311001 MSD A	Antimony	11/03/2022 11:50:56	101	0.0079	mg/L				0.412	101	.22	75	125	20
4311001 SPK A	Antimony	11/03/2022 11:42:00	99.4	0.0079	mg/L	0.1	0.1071	99.4				75	125	
4458008 MS	Antimony	11/03/2022 12:19:32	97.8		mg/L	0.4	0.392	97.8				75	125	
4458008 MSD A	Antimony	11/03/2022 12:23:40	95.4		mg/L				0.382	95.4 2	2.58	75	125	20
4458008 SPK A	Antimony	11/03/2022 12:15:00	102		mg/L	0.1	0.1035	102				75	125	
4467001 MS A	Antimony	11/03/2022 13:04:37	99.5	<0.001	mg/L	0.4	0.398	99.5				75	125	
4467001 MSD A	Antimony	11/03/2022 13:08:45	99.1	<0.001	mg/L				0.396	99.1	0.50	75	125	20
4467004 MS	Antimony	11/03/2022 13:34:18	95	<0.001	mg/L	0.4	0.38	95				75	125	
4467004 MSD A	Antimony	11/03/2022 13:38:27	95.3	<0.001	mg/L				0.381	95.3).26	75	125	20
4470002 MS	Antimony	11/03/2022 14:06:57	95		mg/L	0.4	0.382	95				75	125	
4470002 MSD A	Antimony	11/03/2022 14:11:04	94.4		mg/L				0.38	94.4).52	75	125	20
4470002 SPK A	Antimony	11/03/2022 14:02:00	99.1		mg/L	0.1	0.1013	99.1				75	125	
4506005 MS	Antimony	11/03/2022 14:46:44	98.1		mg/L	0.4	0.392	98.1				75	125	
4506005 MSD A	Antimony	11/03/2022 14:50:52	97.2		mg/L				0.389	97.2).77	75	125	20
LFB-MS A	Antimony	11/03/2022 11:30:45	97		mg/L	0.1	0.097	97				80	120	
LFB-MS A	Antimony	11/01/2022 11:21:00	99.9		mg/L	0.1	0.0999	99.9				85	115	
LFB-MS A	Antimony	11/03/2022 12:48:12	99.9		mg/L	0.1	0.0999	99.9				80	120	
MB A	Antimony	11/03/2022 11:20:19	<0.001		mg/L									
MB A	Antimony	11/01/2022 11:11:00	<0.001		mg/L									
MB A	Antimony	11/03/2022 12:44:04	<0.001		mg/L									
4283001 SPK A	Arsenic	11/03/2022 10:51:00	102	<0.002	mg/L	0.1	0.1016	102				75	125	
4311001 MS	Arsenic	11/03/2022 11:46:46	99.4	0.1093	mg/L	0.4	0.513	99.4				75	125	
4311001 MSD A	Arsenic	11/03/2022 11:50:56	100	0.1093	mg/L				0.516	100).58	75	125	20
4311001 SPK A	Arsenic	11/03/2022 11:42:00	95.3	0.1093	mg/L	0.1	0.2101	95.3				75	125	
4458008 MS	Arsenic	11/03/2022 12:19:32	100		mg/L	0.4	0.404	100				75	125	
4458008 MSD A	Arsenic	11/03/2022 12:23:40	99.3		mg/L				0.4	99.3	.00	75	125	20
4458008 SPK A	Arsenic	11/03/2022 12:15:00	105		mg/L	0.1	0.1085	105				75	125	
4467001 MS	Arsenic	11/03/2022 13:04:37	102	<0.002	mg/L	0.4	0.41	102				75	125	
4467001 MSD A	Arsenic	11/03/2022 13:08:45	101	<0.002	mg/L				0.405	101	.23	75	125	20
4467004 MS	Arsenic	11/03/2022 13:34:18	98.6	<0.002	mg/L	0.4	0.394	98.6				75	125	
4467004 MSD A	Arsenic	11/03/2022 13:38:27	99.3	<0.002	mg/L				0.397	99.3).76	75	125	20
4470002 MS	Arsenic	11/03/2022 14:06:57	96.3		mg/L	0.4	0.389	96.3				75	125	
4470002 MSD A	Arsenic	11/03/2022 14:11:04	99.5		mg/L				0.402	99.5	3.29	75	125	20
4470002 SPK A	Arsenic	11/03/2022 14:02:00	100		mg/L	0.1	0.1046	100				75	125	
4506005 MS	Arsenic	11/03/2022 14:46:44	100	<0.002	mg/L	0.4	0.4	100				75	125	
4506005 MSD A	Arsenic	11/03/2022 14:50:52	102	<0.002	mg/L				0.407	102	.73	75	125	20
LFB-MS A	Arsenic	11/03/2022 11:30:45	98.1		mg/L	0.1	0.0981	98.1				80	120	
LFB-MS A	Arsenic	11/01/2022 11:21:00	99		mg/L	0.1	0.099	99				85	115	
LFB-MS A	Arsenic	11/03/2022 12:48:12	100		mg/L	0.1	0.1	100				80	120	
MB A	Arsenic	11/03/2022 12:44:04	<0.002		mg/L									
MB A	Arsenic	11/01/2022 11:11:00	<0.005		mg/L									
MB A	Arsenic	11/03/2022 11:20:19	<0.002		mg/L									
4283001 SPK E	Barium	11/03/2022 10:51:00	94.9	<0.1	mg/L	0.1	0.1503	94.9				75	125	
4311001 MS E	Barium	11/03/2022 11:46:46	76.5	0.1876	mg/L	0.4	0.486	76.5				75	125	
4311001 MSD E	Barium	11/03/2022 11:50:56	88.5	0.1876	mg/L				0.535	88.5	0.60	75	125	20
4311001 SPK E	Barium	11/03/2022 11:42:00	93.6	0.1876	mg/L	0.1	0.2742	93.6				75	125	
4458008 MS E	Barium	11/03/2022 12:19:32	98.4		mg/L	0.4	0.436	98.4				75	125	
4458008 MSD E	Barium	11/03/2022 12:23:40	98.9		mg/L				0.438	98.9).46	75	125	20
4458008 SPK E	Barium	11/03/2022 12:15:00	105		mg/L	0.1	0.1481	105				75	125	
4467001 MS E	Barium	11/03/2022 13:04:37	94.3	0.0067	mg/L	0.4	0.384	94.3				75	125	

4467001 MSD	Barium	11/03/2022 13:08:45	93.7	0.0067	mg/L				0.382	93.7	0.52	75	125	20
4467004 MS	Barium	11/03/2022 13:34:18		<0.002	mg/L	0.4	0.395	98.9	0.00=	00	0.02	75	125	_0
4467004 MSD	Barium	11/03/2022 13:38:27	98.7	<0.002	mg/L				0.395	98.7	0.00	75	125	20
4470002 MS	Barium	11/03/2022 14:06:57	95.9		mg/L	0.4	0.425	95.9				75	125	
4470002 MSD	Barium	11/03/2022 14:11:04	97.3		mg/L				0.431	97.3	1.40	75	125	20
4470002 SPK	Barium	11/03/2022 14:02:00	98.5		mg/L	0.1	0.1404	98.5				75	125	
4506005 MS	Barium	11/03/2022 14:46:44	99.2	<0.1	mg/L	0.4	0.483	99.2				75	125	
4506005 MSD	Barium	11/03/2022 14:50:52	96.6	<0.1	mg/L				0.473	96.6	2.09	75	125	20
LFB-MS	Barium	11/03/2022 11:30:45	95		mg/L	0.1	0.095	95				80	120	
LFB-MS	Barium		97.8		mg/L	0.1	0.0978	97.8				85	115	
LFB-MS	Barium	11/03/2022 12:48:12			mg/L	0.1	0.098	98				80	120	
MB	Barium	11/03/2022 11:20:19	<0.002		mg/L									
MB	Barium	11/01/2022 11:11:00	<0.002		mg/L									
MB	Barium	11/03/2022 12:44:04	<0.002		mg/L									
4283001 SPK	Beryllium	11/03/2022 10:51:00	101	<0.0005	mg/L	0.1	0.1012	101				75	125	
4311001 MS	Beryllium	11/03/2022 11:46:46	104	<0.002	mg/L	0.4	0.417	104				75	125	
4311001 MSD	Beryllium	11/03/2022 11:50:56	106	<0.002	mg/L				0.423	106	1.43	75	125	20
4311001 SPK	Beryllium	11/03/2022 11:42:00	105	<0.002	mg/L	0.1	0.1052	105				75	125	
4458008 MS	Beryllium	11/03/2022 12:19:32	104		mg/L	0.4	0.416	104				75	125	
4458008 MSD	Beryllium	11/03/2022 12:23:40	99.3		mg/L				0.397	99.3	4.67	75	125	20
4458008 SPK	Beryllium	11/03/2022 12:15:00	110		mg/L	0.1	0.1102	110				75	125	
4467001 MS	Beryllium	11/03/2022 13:04:37	104	<0.0005	mg/L	0.4	0.417	104				75	125	
4467001 MSD	Beryllium	11/03/2022 13:08:45	102	<0.0005	mg/L				0.407	102	2.43	75	125	20
4467004 MS	Beryllium	11/03/2022 13:34:18	98.7	<0.0005	mg/L	0.4	0.395	98.7				75	125	
4467004 MSD	Beryllium	11/03/2022 13:38:27	98	<0.0005	mg/L				0.392	98	0.76	75	125	20
4470002 MS	Beryllium	11/03/2022 14:06:57	96.7		mg/L	0.4	0.387	96.7				75	125	
4470002 MSD	Beryllium	11/03/2022 14:11:04	99.3		mg/L				0.397	99.3	2.55	75	125	20
4470002 SPK	Beryllium	11/03/2022 14:02:00	101		mg/L	0.1	0.1012	101				75	125	
4506005 MS	Beryllium	11/03/2022 14:46:44	101		mg/L	0.4	0.405	101				75	125	
4506005 MSD	Beryllium	11/03/2022 14:50:52	102		mg/L				0.408	102	0.74	75	125	20
LFB-MS	Beryllium	11/03/2022 11:30:45	101		mg/L	0.1	0.101	101				80	120	
LFB-MS	Beryllium	11/02/2022 12:05:00	92.9		mg/L	0.1	0.0929	92.9				85	115	
LFB-MS	Beryllium	11/03/2022 12:48:12	104		mg/L	0.1	0.104	104				80	120	
MB	Beryllium	11/03/2022 12:44:04	< 0.0005		mg/L									
MB	Beryllium	11/02/2022 12:02:00	< 0.0005		mg/L									
MB	Beryllium	11/03/2022 11:20:19	< 0.0005		mg/L									
4283001 SPK	Cadmium	11/03/2022 10:51:00	97	<0.0005	mg/L	0.1	0.097	97				75	125	
4311001 MS	Cadmium	11/03/2022 11:46:46	92.7	<0.002	mg/L	0.4	0.371	92.7				75	125	
4311001 MSD	Cadmium	11/03/2022 11:50:56	94.2	<0.002	mg/L				0.377	94.2	1.60	75	125	20
4311001 SPK	Cadmium	11/03/2022 11:42:00	87.1	<0.002	mg/L	0.1	0.0871	87.1				75	125	
4458008 MS	Cadmium	11/03/2022 12:19:32	93.6		mg/L	0.4	0.375	93.6				75	125	
4458008 MSD	Cadmium	11/03/2022 12:23:40	92		mg/L				0.369	92	1.61	75	125	20
4458008 SPK	Cadmium	11/03/2022 12:15:00	92.2		mg/L	0.1	0.0928	92.2				75	125	
4467001 MS	Cadmium	11/03/2022 13:04:37	93.2	<0.0005	mg/L	0.4	0.373	93.2				75	125	
4467001 MSD	Cadmium	11/03/2022 13:08:45	91.6	<0.0005	mg/L				0.366	91.6	1.89	75	125	20
4467004 MS	Cadmium	11/03/2022 13:34:18	94.6	<0.0005	mg/L	0.4	0.378	94.6				75	125	
4467004 MSD	Cadmium	11/03/2022 13:38:27	95.1	<0.0005	mg/L				0.38	95.1	0.53	75	125	20
4470002 MS	Cadmium	11/03/2022 14:06:57	92.3		mg/L	0.4	0.369	92.3				75	125	
4470002 MSD	Cadmium	11/03/2022 14:11:04	93.4		mg/L				0.374	93.4	1.34	75	125	20
4470002 SPK	Cadmium	11/03/2022 14:02:00	93.6		mg/L	0.1	0.0936	93.6				75	125	
4506005 MS	Cadmium	11/03/2022 14:46:44	96.3		mg/L	0.4	0.385	96.3				75	125	
4506005 MSD	Cadmium	11/03/2022 14:50:52	96.5		mg/L				0.386	96.5	0.26	75	125	20
LFB-MS	Cadmium	11/03/2022 11:30:45	95.6		mg/L	0.1	0.0956	95.6				80	120	
LFB-MS	Cadmium	11/01/2022 11:21:00	101		mg/L	0.1	0.101	101				85	115	

Math	LFB-MS	Cadmium	11/03/2022 12:48:12	99.3		mg/L	0.1	0.0993	99.3				80	120	
Math Carbon Math	MB	Cadmium		<0.0005											
March Marc	MB	Cadmium	11/01/2022 11:11:00	<0.0005											
Control Cont	MB	Cadmium	11/03/2022 12:44:04	<0.0005											
Martin	4283001 SPK	Chromium	11/03/2022 10:51:00	98.7	<0.002		0.1	0.0987	98.7				75	125	
Martin M	4311001 MS	Chromium	11/03/2022 11:46:46	96.7	0.0839		0.4	0.479	96.7				75	125	
Marcian Misser	4311001 MSD	Chromium	11/03/2022 11:50:56	99.7	0.0839					0.491	99.7	2.47	75	125	20
March Marc	4311001 SPK	Chromium		103	0.0839		0.1	0.195	103						
March Name Mar	4458008 MS	Chromium	11/03/2022 12:19:32	99.8		mg/L	0.4	0.406	99.8				75	125	
Marical Series Contains	4458008 MSD	Chromium	11/03/2022 12:23:40	98.1						0.4	98.1	1.49	75		20
44701 MS	4458008 SPK	Chromium	11/03/2022 12:15:00	113			0.1	0.1201	113				75	125	
4487064 MS	4467001 MS	Chromium	11/03/2022 13:04:37	101	<0.002		0.4	0.404	101				75	125	
447002 MSO	4467001 MSD	Chromium	11/03/2022 13:08:45	97.9	<0.002	mg/L				0.392	97.9	3.02	75	125	20
447000 MS	4467004 MS	Chromium	11/03/2022 13:34:18	97.8	<0.002	mg/L	0.4	0.391	97.8				75	125	
147002 MSD 147	4467004 MSD	Chromium	11/03/2022 13:38:27	97.3	<0.002	mg/L				0.389	97.3	0.51	75	125	20
4400005 MSD	4470002 MS	Chromium	11/03/2022 14:06:57	94.6		mg/L	0.4	0.378	94.6				75	125	
450000 MS Mornium	4470002 MSD	Chromium	11/03/2022 14:11:04	96.8		mg/L				0.387	96.8	2.35	75	125	20
March Marc	4470002 SPK	Chromium	11/03/2022 14:02:00	102		mg/L	0.1	0.1016	102				75	125	
March Marc	4506005 MS	Chromium	11/03/2022 14:46:44	97.5	<0.05		0.4	0.39	97.5				75	125	
LFB-M8 Chromin 1101/02/021 11300 01 mgl	4506005 MSD	Chromium	11/03/2022 14:50:52	98.4	<0.05	mg/L				0.394	98.4	1.02	75	125	20
LFB-MS (Normium 1100/0021111111111111111111111111111111	LFB-MS	Chromium	11/03/2022 12:48:12	103		mg/L	0.1	0.103	103				80	120	
M8	LFB-MS	Chromium	11/01/2022 11:21:00	101		mg/L	0.1	0.101	101				85	115	
MB	LFB-MS	Chromium	11/03/2022 11:30:45	99.3		mg/L	0.1	0.0993	99.3				80	120	
MS	MB	Chromium	11/01/2022 11:11:00	<0.002		mg/L									
4311001 MSD Cobalt 1103/20022 11:4606 88.7 4.0002 mgL 0.1 0.0887 98.7 5.0287 5.0287 5.0287 5.0287 5.0288 5.0	MB	Chromium	11/03/2022 12:44:04	<0.002		mg/L									
4311001 MSD Cobale 1003/2022 114/2048 88.3 40.008 mgL 0.4 0.38 98.3 98.2 1.01 76 125 1	MB	Chromium	11/03/2022 11:20:19	<0.002		mg/L									
4311001 MBD Cobalt 11/03/2022 11/14/200 103 01,008 mgL 103 0.1031 103	4283001 SPK	Cobalt	11/03/2022 10:51:00	98.7	<0.002	mg/L	0.1	0.0987	98.7				75	125	
4411001 SFK Cobail 11/03/20/22 11/20/20 38.1 mgL 0.1 0.10/31 10/3 10	4311001 MS	Cobalt	11/03/2022 11:46:46	98.3	<0.008	mg/L	0.4	0.393	98.3				75	125	
448008 MS Cobalt 11/03/2022 11/21/22 86.1 mg/L 0.4 0.36 98.1 T 75 125 125 126 148008 MS Cobalt 11/03/2022 11/21/24 98.5 mg/L 0.1 11/14 10.8 T 75 125 125 126 148000 MS Cobalt 11/03/2022 11/21/24 99.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	4311001 MSD	Cobalt	11/03/2022 11:50:56	99.2	<0.008	mg/L				0.397	99.2	1.01	75	125	20
A48908 MSD Cobat 11/03/2022 12:23:00 95.5 mg/L	4311001 SPK	Cobalt	11/03/2022 11:42:00	103	<0.008	mg/L	0.1	0.1031	103				75	125	
4458008 SPK Cobalt 11/03/2022 12:15:00 98.1	4458008 MS	Cobalt	11/03/2022 12:19:32	98.1		mg/L	0.4	0.396	98.1				75	125	
446701 MS	4458008 MSD	Cobalt	11/03/2022 12:23:40	96.5		mg/L				0.39	96.5	1.53	75	125	20
4467001 MSD	4458008 SPK	Cobalt	11/03/2022 12:15:00	108		mg/L	0.1	0.1114	108				75	125	
446704 MS	4467001 MS	Cobalt	11/03/2022 13:04:37	99.1	<0.002	mg/L	0.4	0.396	99.1				75	125	
4467004 MSD Cobalt 11/03/2022 14:06:57 94.4	4467001 MSD	Cobalt	11/03/2022 13:08:45	96.5	<0.002	mg/L				0.386	96.5	2.56	75	125	20
4470002 MS	4467004 MS	Cobalt	11/03/2022 13:34:18	97.5	<0.002	mg/L	0.4	0.39	97.5				75	125	
4470002 MSD Cobalt 11/03/2022 14:11:04 95 mg/L	4467004 MSD	Cobalt	11/03/2022 13:38:27	96.8	<0.002	mg/L				0.387	96.8	0.77	75	125	20
4470002 SPK Cobalt 11/03/2022 14:02:00 98.4 mg/L 0.1 0.1177 98.4	4470002 MS	Cobalt	11/03/2022 14:06:57	94.4		mg/L	0.4	0.397	94.4				75	125	
4506005 MS Cobalt 11/03/2022 14:46:44 96.2 ng/L 0.4 0.385 96.2	4470002 MSD	Cobalt	11/03/2022 14:11:04	95		mg/L				0.399	95	0.50	75	125	20
4506005 MSD Cobalt 11/03/2022 14:50:52 97 mg/L	4470002 SPK	Cobalt	11/03/2022 14:02:00	98.4		mg/L	0.1	0.1177	98.4				75	125	
FB-MS Cobalt 11/01/2022 11:21:00 100 mg/L 0.1 0.10 100 85 115 FB-MS Cobalt 11/03/2022 12:48:12 102 mg/L 0.1 0.102 102 102 102 80 120 FB-MS Cobalt 11/03/2022 11:30:45 99.5 mg/L 0.1 0.0995 99.5 99.5 102				96.2		mg/L	0.4	0.385	96.2						
LFB-MS Cobalt 11/03/2022 12:48:12 102 mg/L 0.1 0.102 102 102 80 120 LFB-MS Cobalt 11/03/2022 11:30:45 99.5 mg/L 0.1 0.0995 99.5 99.5 80 120 MB Cobalt 11/03/2022 12:44:04 <0.002 mg/L MB Cobalt 11/03/2022 11:11:10 <0.002 mg/L MB Cobalt 11/03/2022 11:21:11:00 <0.002 mg/L MB Cobalt 11/03/2022 11:20:19 <0.002 mg/L 4283001 SPK Lead 11/03/2022 11:20:10 95.1 <0.002 mg/L 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:46:40 85.8 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 4458008 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 4468008 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 401 0.0858 85.8 85.8										0.388	97	0.78			20
LFB-MS Cobalt 11/03/2022 11:30:45 99.5 mg/L 0.1 0.0995 99.5 99.5 80 120 MB Cobalt 11/03/2022 12:44:04 <0.002 mg/L MB Cobalt 11/01/2022 11:11:00 <0.002 mg/L MB Cobalt 11/03/2022 11:20:19 <0.002 mg/L 4283001 SPK Lead 11/03/2022 11:20:19 95.1 <0.0005 mg/L 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:20:9 85.8 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:20:9 91.9 mg/L 4458008 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 4458008 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 401 0.0858 85.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8															
MB Cobalt 11/03/2022 12:44:04 <0.002 mg/L MB Cobalt 11/01/2022 11:11:00 <0.002 mg/L MB Cobalt 11/03/2022 11:20:19 <0.002 mg/L 4283001 SPK Lead 11/03/2022 11:51:00 95.1 <0.0005 mg/L 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:40:00 95.8 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 431001 SPK Lead 11/03/2022 11:42:00 85.8 SP.8 SP.8 SP.8 SP.8 SP.8 SP.8 SP.8 SP						mg/L	0.1	0.102							
MB Cobalt 11/01/2022 11:11:00 <0.002 mg/L MB Cobalt 11/03/2022 11:20:19 <0.002 mg/L 4283001 SPK Lead 11/03/2022 10:51:00 95.1 <0.0005 mg/L 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 431800 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 431800 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 431800 MS Lead 11/03/2022 11:9:32 91.9 mg/L 431901 SPK Lead							0.1	0.0995	99.5				80	120	
MB Cobalt 11/03/2022 11:20:19 <0.002 mg/L 4283001 SPK Lead 11/03/2022 10:51:00 95.1 <0.0005 mg/L 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 4458008 MS Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 6.0 mg/L 75 125 75 125 75 125 75 125 75 125 75 125															
4283001 SPK Lead 11/03/2022 10:51:00 95.1 <0.0005 mg/L 0.1 0.0951 95.1 75 125 4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002 mg/L 0.4 0.345 86.3 75 125 4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 0.1 0.0858 89.9 4.26 75 125 20 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 0.1 0.0858 85.8 75 125 4458008 MS Lead 11/03/2022 12:19:32 91.9 mg/L 0.4 0.37 91.9 5.8 5.8 5.8															
4311001 MS Lead 11/03/2022 11:46:46 86.3 <0.002															
4311001 MSD Lead 11/03/2022 11:50:56 89.9 <0.002 mg/L 0.36 89.9 4.26 75 125 20 4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 0.1 0.0858 85.8 75 125 445808 MS Lead 11/03/2022 12:19:32 91.9 mg/L 0.4 0.37 91.9 75 125															
4311001 SPK Lead 11/03/2022 11:42:00 85.8 <0.002 mg/L 0.1 0.0858 85.8 75 125 4458008 MS Lead 11/03/2022 12:19:32 91.9 mg/L 0.4 0.37 91.9 75 125							0.4	0.345	86.3						
4458008 MS Lead 11/03/2022 12:19:32 91.9 mg/L 0.4 0.37 91.9 75 125										0.36	89.9	4.26			20
					<0.002										
4458008 MSD Lead 11/03/2022 12:23:40 90.6 mg/L 0.365 90.6 1.36 75 125 20							0.4	0.37	91.9						
	4458008 MSD	Lead	11/03/2022 12:23:40	90.6		mg/L				0.365	90.6	1.36	75	125	20

4458008 SPK	Lead	11/03/2022 12:15:00	93.1		mg/L	0.1	0.0958	93.1				75	125	
4467001 MS	Lead	11/03/2022 13:04:37	91.3	<0.0005	mg/L	0.4	0.365	91.3				75	125	
4467001 MSD	Lead	11/03/2022 13:08:45	90.4	<0.0005	mg/L				0.362	90.4	0.82	75	125	20
4467004 MS	Lead	11/03/2022 13:34:18	98	<0.0005	mg/L	0.4	0.392	98				75	125	
4467004 MSD	Lead	11/03/2022 13:38:27	98.2	<0.0005	mg/L				0.393	98.2	0.25	75	125	20
4470002 MS	Lead	11/03/2022 14:06:57	93.4		mg/L	0.4	0.374	93.4				75	125	
4470002 MSD	Lead	11/03/2022 14:11:04	95.2		mg/L				0.381	95.2	1.85	75	125	20
4470002 SPK	Lead	11/03/2022 14:02:00	94.5		mg/L	0.1	0.0953	94.5	0.00	00.2		75	125	
4506005 MS	Lead	11/03/2022 14:46:44	97.9	<0.0005	mg/L	0.4	0.392	97.9				75	125	
4506005 MSD	Lead	11/03/2022 14:50:52	97.2	<0.0005	mg/L				0.389	97.2	0.77	75	125	20
LFB-MS	Lead	11/03/2022 11:30:45	94.6	10.0000	mg/L	0.1	0.0946	94.6	0.000	· · · <u>-</u>		80	120	
LFB-MS	Lead	11/01/2022 11:21:00	97.2		mg/L	0.1	0.0972	97.2				85	115	
LFB-MS	Lead	11/03/2022 12:48:12			mg/L	0.1	0.0977	97.7				80	120	
MB	Lead	11/01/2022 11:11:00	<0.0005		mg/L	-		-						
MB	Lead	11/03/2022 11:20:19	< 0.0005		mg/L									
MB	Lead	11/03/2022 12:44:04	< 0.0005		mg/L									
4467001 PDS	Lithium	10/26/2022 09:08:00	88.9	0.573	mg/L	2	2.35	88.9				75	125	
4467001 PDSD	Lithium	10/26/2022 09:09:00	88.6	0.573	mg/L	_			2.344	88.6	0.26	75	125	20
4467004 MS	Lithium	10/26/2022 09:11:51	98.6	<0.02	mg/L	0.4	0.3946	98.6	2.011	00.0	0.20	70	130	20
4467004 MSD	Lithium	10/26/2022 09:12:28	99.6	<0.02	mg/L	0.1	0.0010	00.0	0.3982	99.6	0.91	70	130	20
LFB-OE	Lithium	10/26/2022 09:07:42	99.6	10.02	mg/L	0.4	0.3983	99.6	0.0002	00.0	0.01	85	115	20
MB	Lithium	10/26/2022 09:07:09	<0.04		mg/L	0.1	0.0000	00.0						
4278005 MS	Mercury	11/15/2022 10:45:00	96.5	<0.0002	mg/L	0.002	0.0019	96.5				70	130	
4278005 MSD	Mercury	11/15/2022 10:45:00	98.1	<0.0002	mg/L	0.002	0.0010	00.0	0.002	98.1	5.13	70	130	20
4467004 MS	Mercury	11/15/2022 10:45:00	96.4	<0.0002	mg/L	0.002	0.0019	96.4	0.002	30.1	0.10	70	130	20
4467004 MSD	Mercury	11/15/2022 10:45:00	97.4	<0.0002	mg/L	0.002	0.0010	00.1	0.0019	97.4	0.00	70	130	20
4832008 MS	Mercury	11/15/2022 10:45:00	107	<0.0002	mg/L	0.002	0.0021	107	0.0010	57.4	0.00	70	130	20
4832008 MSD	Mercury	11/15/2022 10:45:00	108	<0.0002	mg/L	0.002	0.0021	107	0.0022	108	4.65	70	130	20
4962003 MS	Mercury	11/15/2022 10:45:00	104	<0.0002	mg/L	0.002	0.0021	104	0.0022	100	4.00	70	130	20
4962003 MSD	Mercury	11/15/2022 10:45:00	110	<0.0002	mg/L	0.002	0.0021	101	0.0022	110	4.65	70	130	20
LFB	Mercury	11/15/2022 10:45:00	103	V0.0002	mg/L	0.002	0.0021	103	0.0022	110	1.00	85	115	20
LFB	Mercury	11/15/2022 10:45:00	101		mg/L	0.002	0.002	101				85	115	
LFB	Mercury	10/28/2022 13:46:00	98		mg/L	0.002	0.002	98				85	115	
LRB	Mercury	11/15/2022 10:45:00	<0.0002		mg/L	0.002	0.002	30				00	110	
LRB	Mercury	10/28/2022 13:46:00	<0.0002		mg/L									
MB	Mercury	11/15/2022 10:45:00	<0.0002		mg/L									
4283001 SPK	Molybdenum	11/03/2022 10:43:00	105	<0.002	mg/L	0.1	0.1048	105				75	125	
4311001 MS	Molybdenum	11/03/2022 11:46:46	82.1	<25	mg/L	0.1	1.63	82.1				75 75	125	
4311001 MSD	Molybdenum	11/03/2022 11:50:56	84.5	<25	mg/L	0.4	1.00	02.1	1.64	84.5	0.61	75 75	125	20
4311001 MSB 4311001 SPK	Molybdenum	11/03/2022 11:42:00	56.6	<25	mg/L	0.1	1.357	56.6	1.04	04.0	0.01	75 75	125	20
4458008 MS	Molybdenum	11/03/2022 12:19:32	105	\20	mg/L	0.4	0.426	105				75 75	125	
4458008 MSD	Molybdenum	11/03/2022 12:13:32	102		mg/L	0.4	0.420	100	0.414	102	2.86	75 75	125	20
4458008 SPK	Molybdenum	11/03/2022 12:15:00	115		mg/L	0.1	0.1203	115	0.414	102	2.00	75 75	125	20
4467001 MS	Molybdenum	11/03/2022 13:04:37	106	<0.002	mg/L	0.4	0.426	106				75 75	125	
4467001 MSD	Molybdenum	11/03/2022 13:04:37	106	<0.002	mg/L	0.4	0.420	100	0.423	106	0.71	75 75	125	20
4467004 MS	Molybdenum	11/03/2022 13:34:18		<0.002	mg/L	0.4	0.386	96.5	0.423	100	0.71	75 75	125	20
4467004 MSD	Molybdenum	11/03/2022 13:38:27	97	<0.002	mg/L	0.4	0.500	30.3	0.388	97	0.52	75 75	125	20
4470002 MS	Molybdenum	11/03/2022 13:36:27	96.6	10.00 2	mg/L	0.4	0.429	96.6	0.000	91	J.U <u>L</u>	75 75	125	20
4470002 MSD	Molybdenum	11/03/2022 14:00:57	97.9		mg/L	0.4	U.743	30.0	0.434	97.9	1.16	75 75	125	20
4470002 MSD 4470002 SPK	Molybdenum	11/03/2022 14:11:04	101			0.1	0.1437	101	U. + J 4	ש. וש	1.10	75 75	125	۷۵
4506005 MS	Molybdenum	11/03/2022 14:46:44	99.7		mg/L	0.1	0.1437	99.7				75 75	125	
4506005 MSD	Molybdenum	11/03/2022 14:46:44	100		mg/L	0.4	0.033	∂∂. I	0.401	100	0.50		125	20
4506005 MSD LFB-MS	Molybdenum Molybdenum	11/03/2022 14:50:52	100		mg/L	0.1	0.104	104	U.4U I	100	0.00	75 85	125 115	20
LFB-MS	Molybdenum	11/03/2022 11:21:00			mg/L	0.1	0.104	104				80	120	
LFD-IVIO	worybuchuill	11/03/2022 12.40.12	102		mg/L	U. I	0.102	102					120	

LFB-MS	Molybdenum	11/03/2022 11:30:45	98.7		mg/L	0.1	0.0987	98.7				80	120	
MB	Molybdenum	11/03/2022 11:20:19	<0.002		mg/L		0.000.	00					0	
MB	Molybdenum	11/03/2022 12:44:04	<0.002		mg/L									
MB	Molybdenum	11/01/2022 11:11:00	<0.002		mg/L									
4283001 SPK	Selenium		93.4	<0.005	mg/L	0.1	0.0934	93.4				75	125	
4311001 MS	Selenium	11/03/2022 11:46:46		0.0969	mg/L	0.4	0.476	98				75	125	
4311001 MSD	Selenium		102	0.0969	mg/L				0.49	102	2.90	75	125	20
4311001 SPK	Selenium		95.2	0.0969	mg/L	0.1	0.179	95.2				75	125	-
4458008 MS	Selenium		97.2		mg/L	0.4	1.2	97.2				75	125	
4458008 MSD	Selenium		102		mg/L				1.22	102	1.65	75	125	20
4458008 SPK	Selenium	11/03/2022 12:15:00	108		mg/L	0.1	0.9164	108				75	125	
4467001 MS	Selenium	11/03/2022 13:04:37	94.2	0.0313	mg/L	0.4	0.408	94.2				75	125	
4467001 MSD	Selenium	11/03/2022 13:08:45	93.2	0.0313	mg/L				0.404	93.2	0.98	75	125	20
4467004 MS	Selenium	11/03/2022 13:34:18	97.7	< 0.005	mg/L	0.4	0.391	97.7				75	125	
4467004 MSD	Selenium	11/03/2022 13:38:27	98.4	<0.005	mg/L				0.393	98.4	0.51	75	125	20
4470002 MS	Selenium	11/03/2022 14:06:57	96.1		mg/L	0.4	0.393	96.1				75	125	
4470002 MSD	Selenium	11/03/2022 14:11:04	95.6		mg/L				0.391	95.6	0.51	75	125	20
4470002 SPK	Selenium	11/03/2022 14:02:00	95.2		mg/L	0.1	0.1038	95.2				75	125	
4506005 MS	Selenium	11/03/2022 14:46:44	101	< 0.005	mg/L	0.4	0.403	101				75	125	
4506005 MSD	Selenium	11/03/2022 14:50:52	101	<0.005	mg/L				0.403	101	0.00	75	125	20
LFB-MS	Selenium	11/03/2022 11:30:45	92.7		mg/L	0.1	0.0927	92.7				80	120	
LFB-MS	Selenium	11/03/2022 12:48:12	97		mg/L	0.1	0.097	97				80	120	
LFB-MS	Selenium	11/01/2022 11:21:00	97.8		mg/L	0.1	0.0978	97.8				85	115	
MB	Selenium	11/03/2022 12:44:04	<0.005		mg/L									
MB	Selenium	11/03/2022 11:20:19	<0.005		mg/L									
MB	Selenium	11/01/2022 11:11:00	<0.01		mg/L									
4283001 SPK	Thallium	11/03/2022 10:51:00	90.3	<0.0005	mg/L	0.1	0.0903	90.3				75	125	
4311001 MS	Thallium	11/03/2022 11:46:46	86.1	<0.002	mg/L	0.4	0.344	86.1				75	125	
4311001 MSD	Thallium	11/03/2022 11:50:56	87.5	<0.002	mg/L				0.35	87.5	1.73	75	125	20
4311001 SPK	Thallium		82.5	<0.002	mg/L	0.1	0.0825	82.5				75	125	
4458008 MS	Thallium	11/03/2022 12:19:32			mg/L	0.4	0.352	88				75	125	
4458008 MSD	Thallium	11/03/2022 12:23:40			mg/L				0.346	86.5	1.72	75	125	20
4458008 SPK	Thallium	11/03/2022 12:15:00			mg/L	0.1	0.0898	89.8				75	125	
4467001 MS	Thallium	11/03/2022 13:04:37		<0.0005	mg/L	0.4	0.348	87				75	125	
4467001 MSD	Thallium	11/03/2022 13:08:45		<0.0005	mg/L				0.345	86.2	0.86	75	125	20
4467004 MS	Thallium	11/03/2022 13:34:18		<0.0005	mg/L	0.4	0.376	93.9				75	125	
4467004 MSD	Thallium		93.1	<0.0005	mg/L				0.372	93.1	1.07	75	125	20
4470002 MS	Thallium		89.4		mg/L	0.4	0.358	89.4				75	125	
4470002 MSD	Thallium	11/03/2022 14:11:04			mg/L				0.363	90.8	1.39	75	125	20
4470002 SPK	Thallium	11/03/2022 14:02:00			mg/L	0.1	0.0909	90.9				75	125	
4506005 MS	Thallium				mg/L	0.4	0.375	93.7				75	125	
4506005 MSD	Thallium		93.7		mg/L				0.375	93.7	0.00	75	125	20
LFB-MS	Thallium	11/03/2022 11:30:45			mg/L	0.1	0.0897	89.7				80	120	
LFB-MS	Thallium	11/03/2022 12:48:12			mg/L	0.1	0.0922	92.2				80	120	
LFB-MS	Thallium		89.8		mg/L	0.1	0.0898	89.8				85	115	
MB	Thallium	11/03/2022 12:44:04	<0.0005		mg/L									
MB	Thallium	11/03/2022 11:20:19	<0.0005		mg/L									
MB	Thallium	11/01/2022 11:11:00	<0.0005		mg/L									



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Fall 2022 (4467) PO: 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

4467003 (Dup 1) - Sample

Time sampled was not supplied by the client.

4467004 (Field Blank) - Sample

Time sampled was not supplied by the client.

Analysis Results Comments

4467001 (MW13)

Sample analyzed beyond holding time.(pH)

4467002 (MW80R)

Sample analyzed beyond holding time.(pH)

4467003 (Dup 1)

Sample analyzed beyond holding time.(pH)

4467004 (Field Blank)

Sample analyzed beyond holding time.(pH)

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467001
 Date Collected:
 10/17/2022 12:30
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: 120.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	9773	umhos/cm	1	1	10/17/2022 12:30	10/17/2022 12:30	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.03	units	0.01	1	10/17/2022 12:30	10/17/2022 12:30	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	8.73	degrees C		1	10/17/2022 12:30	10/17/2022 12:30	JSM		
Method: ASTM D516-16									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6890	mg/L	250	50	10/26/2022 09:49	10/26/2022 09:49	EJV	MA,NDA	
Method: EPA 180.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	0.57	NTU	0.1	1	10/17/2022 12:30	10/17/2022 12:30	JSM		
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	10/28/2022 11:15	10/28/2022 13:46	AMC	MA,NDA	
Method: EPA 353.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	4.15	mg/L	1	5	10/20/2022 10:28	10/20/2022 10:28	EJV	MA,NDA	
Method: EPA 365.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
					10/20/2022	10/24/2022			

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2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID: 4467001 **Date Collected:** 10/17/2022 12:30 Matrix: Groundwater Sample ID: MW13 Date Received: 10/19/2022 08:20 MVTL Field Service Collector:

Temp @ Receipt (C): 0.6

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	0.59	mg/L	0.5	5	10/24/2022 08:55	10/27/2022 11:48	SLZ	MA,NDA	
Calcium	397	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	10/24/2022 08:55	11/01/2022 12:17	SLZ	MA,NDA	
Magnesium	593	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Manganese, Dissolved	<0.25	mg/L	0.25	5	10/24/2022 08:55	11/01/2022 12:17	SLZ	MA,NDA	
Potassium	23.8	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Sodium	1860	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Method: EPA 6020B									

Method	l:	EPA	6020E
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Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Barium, Dissolved	0.0063	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Selenium, Dissolved	0.0334	mg/L	0.005	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:52	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	156	meq/L		1	11/04/2022 13:57	11/04/2022 13:57	CW		
Cation Summation	150	meq/L		1	11/04/2022 13:57	11/04/2022 13:57	CW		
Percent Difference	-2.01	%		1	11/04/2022 13:57	11/04/2022 13:57	CW		
TDS - Summation	10100	mg/L	12.5	1	11/04/2022 13:57	11/04/2022 13:57	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467001Date Collected:10/17/2022 12:30Matrix:GroundwaterSample ID:MW13Date Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 17:29	10/20/2022 17:29	RAA		
Alkalinity, Total	513	mg/L as CaCO3	20.5	1	10/20/2022 17:29	10/20/2022 17:29	RAA	MA,NDA	
Bicarbonate	513	mg/L as CaCO3	20.5	1	10/20/2022 17:29	10/20/2022 17:29	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 17:29	10/20/2022 17:29	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 17:29	10/20/2022 17:29	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3430	mg/L as CaCO3	6.62	1	11/04/2022 13:57	11/04/2022 13:57	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	9777	umhos/cm	1	1	10/20/2022 17:29	10/20/2022 17:29	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.5	units	0.1	1	10/20/2022 17:29	10/20/2022 17:29	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	71.5	mg/L	2.0	1	10/26/2022 12:28	10/26/2022 12:28	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.84	mg/L	0.1	1	10/20/2022 17:29	10/20/2022 17:29	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	13.8		0.17	1	11/04/2022 13:57	11/04/2022 13:57	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance - Field	5892	umhos/cm	1	1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: 150.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
pH - Field	7.05	units	0.01	1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: 170.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Temperature - Field C	9.87	degrees C		1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: ASTM D516-16									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	3460	mg/L	200	40	10/26/2022 09:57	10/26/2022 09:57	EJV	MA,NDA	
Method: EPA 180.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Turbidity - Field	1.15	NTU	0.1	1	10/17/2022 15:43	10/17/2022 15:43	JSM		
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	10/28/2022 11:15	10/28/2022 13:46	AMC	MA,NDA	
Method: EPA 353.2									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	22.7	mg/L	1	5	10/20/2022 10:29	10/20/2022 10:29	EJV	MA,NDA	
Method: EPA 365.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
	<0.1	mg/L	0.1	1	10/20/2022	10/24/2022	EJV	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.5	mg/L	0.5	5	10/24/2022 08:55	10/27/2022 11:49	SLZ	MA,NDA	
Calcium	418	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	10/24/2022 08:55	11/01/2022 12:18	SLZ	MA,NDA	
Magnesium	529	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Manganese, Dissolved	0.26	mg/L	0.25	5	10/24/2022 08:55	11/01/2022 12:18	SLZ	MA,NDA	
Potassium	5.17	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Sodium	582	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:47	SLZ	MA,NDA	
Method: EPA 6020B									

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Barium, Dissolved	0.0107	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Molybdenum, Dissolved	0.0025	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Selenium, Dissolved	0.0452	mg/L	0.005	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 15:56	MDE	MA,NDA	

Method: SM1030F

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	88.7	meq/L		1	11/04/2022 13:57	11/04/2022 13:57	CW		
Cation Summation	89.8	meq/L		1	11/04/2022 13:57	11/04/2022 13:57	CW		
Percent Difference	0.65	%		1	11/04/2022 13:57	11/04/2022 13:57	CW		
TDS - Summation	5490	mg/L	12.5	1	11/04/2022 13:57	11/04/2022 13:57	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 19:02	10/20/2022 19:02	RAA		
Alkalinity, Total	543	mg/L as CaCO3	20.5	1	10/20/2022 19:02	10/20/2022 19:02	RAA	MA,NDA	
Bicarbonate	543	mg/L as CaCO3	20.5	1	10/20/2022 19:02	10/20/2022 19:02	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 19:02	10/20/2022 19:02	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 19:02	10/20/2022 19:02	RAA		
Method: SM2340B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3220	mg/L as CaCO3	6.62	1	11/04/2022 13:57	11/04/2022 13:57	CW	MA,NDA	
Method: SM2510 B-2011 EC									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	5924	umhos/cm	1	1	10/20/2022 19:02	10/20/2022 19:02	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.6	units	0.1	1	10/20/2022 19:02	10/20/2022 19:02	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	149	mg/L	2.0	1	10/26/2022 12:29	10/26/2022 12:29	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.23	mg/L	0.1	1	10/20/2022 19:02	10/20/2022 19:02	RAA		
Method: USDA 20b									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	4.46		0.17	1	11/04/2022 13:57	11/04/2022 13:57	CW		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4467003
 Date Collected:
 11/04/2022
 Matrix:
 Groundwater

 Sample ID:
 Dup 1
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 0.6

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	6700	mg/L	250	50	10/26/2022 09:58	10/26/2022 09:58	EJV	MA,NDA	
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	10/28/2022 11:15	10/28/2022 13:46	AMC	MA,NDA	

Method:	EDA	252 2	

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Nitrate + Nitrite as N	4.10	mg/L	1	5	10/20/2022 10:31	10/20/2022 10:31	EJV	MA,NDA	

Method: EPA 365.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Phosphorus as P	<0.1	mg/L	0.1	1	10/20/2022 11·31	10/24/2022 09·59	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	0.59	mg/L	0.5	5	10/24/2022 08:55	10/27/2022 11:51	SLZ	MA,NDA	
Calcium	409	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:49	SLZ	MA,NDA	
Iron, Dissolved	<0.5	mg/L	0.5	5	10/24/2022 08:55	11/01/2022 12:22	SLZ	MA,NDA	
Magnesium	612	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:49	SLZ	MA,NDA	
Manganese, Dissolved	<0.25	mg/L	0.25	5	10/24/2022 08:55	11/01/2022 12:22	SLZ	MA,NDA	
Potassium	24.0	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:49	SLZ	MA,NDA	
Sodium	1920	mg/L	5	5	10/19/2022 16:41	10/25/2022 13:49	SLZ	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467003Date Collected:11/04/2022Matrix:GroundwaterSample ID:Dup 1Date Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Method: EPA 6020B									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Barium, Dissolved	0.0062	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Selenium, Dissolved	0.0334	mg/L	0.005	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:00	MDE	MA,NDA	
Method: SM1030F									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Anion Summation	154	meq/L		1	11/04/2022 13:58	11/04/2022 13:58	CW		
Cation Summation	155	meq/L		1	11/04/2022 13:58	11/04/2022 13:58	CW		

Method:	SM2320	B-2011

Percent Difference

TDS - Summation

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 14:36	10/20/2022 14:36	RAA		
Alkalinity, Total	579	mg/L as CaCO3	20.5	1	10/20/2022 14:36	10/20/2022 14:36	RAA	MA,NDA	
Bicarbonate	579	mg/L as CaCO3	20.5	1	10/20/2022 14:36	10/20/2022 14:36	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 14:36	10/20/2022 14:36	RAA		
Hydroxide	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 14:36	10/20/2022 14:36	RAA		

1

11/04/2022

11/04/2022

13:58

13:58

11/04/2022

11/04/2022

13:58

13:58

CW

CW

Method: SM2340B-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	3540	mg/L as CaCO3	6.62	1	11/04/2022 13:57	11/04/2022 13:57	CW	MA,NDA	

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Report Date: Friday, November 18, 2022 4:37:49 PM

0.39

10100

mg/L

12.5



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RAA

14:36

2800 Account #: Client: Montana-Dakota Utilities - Bismarck

Analytical Results

4467003 Lab ID: **Date Collected:** 11/04/2022 Matrix: Groundwater 10/19/2022 08:20 Sample ID: Dup 1 Date Received: MVTL Field Service Collector:

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	9783	umhos/cm	1	1	10/20/2022 14:36	10/20/2022 14:36	RAA	MA,NDA	
Method: SM4500 H+ B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
рН	7.2	units	0.1	1	10/20/2022 14:36	10/20/2022 14:36	RAA	MA,NDA	*
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	71.8	mg/L	2.0	1	10/26/2022 12:30	10/26/2022 12:30	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.84	ma/l	0.1	1	10/20/2022	10/20/2022	RAA		

Method:	USDA	20b

Fluoride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sodium Adsorption Ratio	14.0		0.17	1	11/04/2022 13:58	11/04/2022 13:58	CW		

14:36

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Report Date: Friday, November 18, 2022 4:37:49 PM

0.84

mg/L

0.1



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467004Date Collected:11/04/2022Matrix:GroundwaterSample ID:Field BlankDate Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	<5	mg/L	5	1	10/26/2022 09:59	10/26/2022 09:59	EJV	MA,NDA	
Method: EPA 245.1									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury, Dissolved	<0.0002	mg/L	0.0002	1	10/28/2022 11:15	10/28/2022 13:46	AMC	MA,NDA	
Method: EPA 353.2									

.........

Parameter	Results	Units	KDL	DF	Prepared	Anaiyzed	ву	Cert	Quai
Nitrate + Nitrite as N	<0.2	mg/L	0.2	1	10/20/2022 10:32	10/20/2022 10:32	EJV	MA,NDA	

Method: EPA 365.1

Parameter	Results	Units	KDL	DF	Prepared	Anaiyzed	ву	Cert	Quai
Phosphorus as P	<0.1	mg/L	0.1	1	10/20/2022 11:31	10/24/2022 10:00	EJV	MA,NDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron, Dissolved	<0.1	mg/L	0.1	1	10/24/2022 08:55	10/27/2022 11:53	SLZ	MA,NDA	
Calcium	<1	mg/L	1	1	10/19/2022 16:41	10/25/2022 13:50	SLZ	MA,NDA	
Iron, Dissolved	<0.1	mg/L	0.1	1	10/24/2022 08:55	11/01/2022 12:23	SLZ	MA,NDA	
Magnesium	<1	mg/L	1	1	10/19/2022 16:41	10/25/2022 13:50	SLZ	MA,NDA	
Manganese, Dissolved	<0.05	mg/L	0.05	1	10/24/2022 08:55	11/01/2022 12:23	SLZ	MA,NDA	
Potassium	<1	mg/L	1	1	10/19/2022 16:41	10/25/2022 13:50	SLZ	MA,NDA	
Sodium	<1	mg/L	1	1	10/19/2022 16:41	10/25/2022 13:50	SLZ	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467004Date Collected:11/04/2022Matrix:GroundwaterSample ID:Field BlankDate Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 0.6

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Arsenic, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	•
Barium, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Cadmium, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Chromium, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Lead, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Molybdenum, Dissolved	<0.002	mg/L	0.002	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Selenium, Dissolved	<0.005	mg/L	0.005	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Silver, Dissolved	<0.0005	mg/L	0.0005	5	10/24/2022 08:55	11/03/2022 16:04	MDE	MA,NDA	
Method: SM1030F									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
TDS - Summation	<12.5	mg/L	12.5	1	11/04/2022 13:59	11/04/2022 13:59	CW		
Method: SM2320 B-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Alkalinity, Phenolphthalein	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 12:21	10/20/2022 12:21	RAA		
Alkalinity, Total	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 12:21	10/20/2022 12:21	RAA	MA,NDA	
Bicarbonate	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 12:21	10/20/2022 12:21	RAA		
Carbonate	<20.5	mg/L as CaCO3	20.5	1	10/20/2022 12:21	10/20/2022 12:21	RAA		

Method:	SM2340B-2011

Hydroxide

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Hardness - Total	<6.62	mg/L as CaCO3	6.62	1	11/04/2022 13:58	11/04/2022 13:58	CW	MA,NDA	

1

10/20/2022

12:21

10/20/2022

12:21

RAA

mg/L as

CaCO3

<20.5

20.5

Method: SM2510 B-2011 EC

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Specific Conductance	1	umhos/cm	1	1	10/21/2022 09:20	10/21/2022 09:20	RAA	MA,NDA	

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4467004Date Collected:11/04/2022Matrix:GroundwaterSample ID:Field BlankDate Received:10/19/2022 08:20Collector:MVTL Field Service

0.17

Temp @ Receipt (C): 0.6

Sodium Adsorption Ratio

< 0.17

Method: SM4500 H+ B-2011										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual *	
рН	6.3	units	0.1	1	10/20/2022 12:21	10/20/2022 12:21	RAA	MA,NDA		
Method: SM4500-CI-E 2011										
Parameter	Results	Units	RDL			Analyzed	Ву	Cert	Qual	
Chloride	<2.0	mg/L	2.0	1	10/26/2022 12:31	10/26/2022 12:31	EJV	MA,NDA		
Method: SM4500-F-C-2011										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual	
Fluoride	<0.1	mg/L	0.1	1	10/20/2022 12:21	10/20/2022 12:21	RAA			
Method: USDA 20b										
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual	

1

11/04/2022

13:58

11/04/2022

13:58

CW



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Account #: 2800

Client: Montana-Dakota Utilities - Bismarck



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www.mvil.com

October 20, 2022

Montana-Dakota Utilities Todd Peterson 400 N. 4th St Bismarck, ND 58501

RE: MDU Heskett Groundwater Sampling

Dear Mr. Peterson,

From October 17-18, 2022, MVTL Field Services division collected ground water samples at the MDU Heskett Station near Mandan, ND. Samples were collected from 2 of the 5 wells. Wells 1-90, 2-90, and 3-90 were found to be dry during this sample event. A Duplicate sample was collected from well MW13. Samples collected were placed on ice and transported to MVTL in Bismarck, ND for analysis.

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

Sincerely,

Jeremy Meyer

MVTL Field Services Manager

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

Friday, November 18, 2022 4:37:49 PM Report Date:



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV		aborato	boratories W0: 4467										Cha	Chain of Custody Record			
Report To:	MDU Todd Peterson	CC:				_					Project Na	ame:		MDU Heskett			
Address:	400 N. 4th St												Event:	_		Fall 2022	
Phone:	Bismarck, ND 58501												Sampled	Qu.		rail 2022	
Email:	701-425-2427 Todd:Peterson@mdu.c										Sampled		Jeny	h			
-	Sam	ple Information	1		T		Sa	lam	e Cont	ainers		T	Field Re	adings			
Lab Number	Sample ID	Date	Тіте	Sample Type	1 Liter Raw							Temp (°C)	Spec. Cond.	Hd	Turbidity (NTU)	Analysis Required	
001	MW13	170012	1230	GW		X	X					8.73	9773	7.03	0.57		
_	MW1-90	Bostze	1205	GW	X	X	X	X	X	_	\perp	Dry					
_	MW2-90	180.tz2	1202	GW				X		-	\vdash	Dry			-		
	MW3-90	180c+22	1158	GW				X	*	+	+	Dry	C100 4	-		MDU Heskett List	
002	MW80R	170ct22	1543	GW			X			-	H	9.87	5892	7.05	1.15 NA		
003	Dup 1 Field Blank (FB)	170ct22	NA	GW	X	X	X	X	+	+	+	NA NA	NA	NA NA	NA NA		
007	Field Dialik (FD)	1000100	10.75	GW	1^	^	^	^	+	+	+	IVA	IVA	INA	IVA		
Comments:	* 180+ 22 +																
	Relinquished By Name	Date/Time	loca	Samp	T C	ond		n mp (°C)	-	7	01	Name	Receive	d By	Date/Time	
	. /	19 Oct LL	Log	(In)	1			0	6	-	TANI	101	Name	_	- 1	190da2	
()	12	obto	Walk	In #2	TM562/TM8			M805	1805) ///		1/50	1	~		0820		

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL Field Da					tack	neet		Company:		MDU Heskett				
11010.00							Event:		Fall 2022					
			Gr	oundwate	r Assessm	ent		Sample ID:			1)	_		
2616 E. Broadway Ave, E	ismarck, ND							Sampling P	ersonal:	~	70/2	_		
Phone: (701) 258														
Weather Condition	s:	Temp:	50	°F	Wind:	N	@ 2-10	>	Precip:	Sunny / P	artly Cloudy / Cloudy	_		
	WELL INFO	ORMATIO	N					SAM	PLING IN	FORMATI	ON			
Well Locked?	YES	(NO)			1	Purging Me	thod:	Bladder		1	Control Settings:	_		
Well Labeled?	YES	NO			1	Sampling N		Bladder		1	Purge: S Se	ec.		
Casing Strait?	YES	NO			1	Dedicated	Equipment?	YES	NO	1	Recover: 55 Se	c.		
Grout Seal Intact?	YES	NO	Not \	/isible	1						PSI: 30			
Repairs Necessary?]	Duplicate S	ample?	CYES	NO]				
	g Diameter:]	Duplicate S	ample ID:	Duy 1]				
Water Level B			263	ft				,						
	pth of Well:	← ft				Bottle List:								
	/ell Volume:	-	-	liters		1 Liter Raw 4- 1L Nitric				×2				
	op of Pump:			ft	1	500mL Nitric								
Water Level A			2.84	ft	1	500mL Nitrie								
Measureme	ent Method:	Electric V	Nater Level	Indicator		250mL Sulfu	ric]				
					FIE	LD READIN	IGS							
Stabilization Para	meters	Temp.	Spec.	l	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or Comment	_		
(3 Consecuti	ve)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.	_		
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	_		
140 102	455	Start of Wel	l Purge	•			-							
170,00	1215	8.76	9761	7.03	3.59	151.2	2.69	32.00	100.0	2000.0	Clear			
	1220	8.62	9754	7.03	3,37	151.3	1.4(32.59	100.0	5000	Clear			
	1225	B.73	9761	7.03	3.31	152,5	1.02	32.68	(J.00)	500.0	Clear			
	1230	8.73	9773	7.03	3,28	151.9	0.37	32,75	IN)'O	5000	Cler			
												_		
												_		
												_		
												_		
						-						_		
	1	1					L			1				
	144-11-04	-Lillanda	nec.	*10					D	2000 -				
	Well St	abilized?	(YES)	NO				Total Vol	ume Purged	3500.0	mL			
Sample Date	Well Sta	abilized?	YES Spec.	NO	_		Turbidity	Total Vol	ume Purged	3500.0	ml. Appearance or Comment	_		

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17 Oct 22
Comments:





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

441.55	•		Eial	4 D	tack	heet		Company:		MDU Hesl	kett	
MVTI			riei	u Da	ıtası	ieet		Event:		Fall 2022		
			G	roundwate	er Assessm	ent		Sample ID:		1-90,		
2616 E. Broadway Ave, Bi	smarck, ND							Sampling F	ersonal:		1-1/10	
Phone: (701) 258-9	9720										119	
Weather Conditions		Temp:		°F	Wind:		@		Precip:	Sunny / Pa	artly Cloudy / Cloudy	
	WELL INFO	ORMATIO	N					SAM	PLING IN	IFORMATI	ON	
Well Locked?	YES	NO			1	Purging M	ethod:	Bladder		1	Control Settings:	
Well Labeled?	YES	NO			1	Sampling I		Bladder		1	Purge: Sec	
Casing Strait?	YES	NO			1		Equipment		NO	1	Recover: Sec	
Grout Seal Intact?	YES	NO	Not \	/isible	1			-		-	PSI:	
Repairs Necessary?					1	Duplicate :	Sample?	YES	(NØ	7		
Casing	Diameter:	2	2"		1	Duplicate :				1		
Water Level Be	fore Purge:	Below	Pine	ft	1			•		-		
Total Dep	oth of Well:		- (ft	1		Bottl	e List:		7		
W	ell Volume:	_		liters	1	1 Liter Raw		4- 1L Nitric		1		
Depth to To	p of Pump:	14.48	8	ft	1	500mL Nitrie						
Water Level Af	After Sample: ft 500mL Nitric (filtered)					1						
Measureme	nt Method:	Electric V	Nater Level	Indicator	1	250mL Sulfu	ıric			1		
					FIE	LD READII	NGS			-		
Stabilization Parar	neters	Temp.	Spec.		DO	ORP	Turbidity		Pumping	mL	Appearance or Comment	
(3 Consecutiv	e)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid	
		Start of Wel	l Purge		•	•						
		/										
1												
1												
	Well Sta	abilized?	YES	NO				Total Vol	ume Purged	:	mL	
Sample Date	Time	Temp.	Spec.	pH			Turbidity				Appearance or Comment	
		(°C)	Cond.	pri			(NTU)				Clarity, Color, Odor, Ect.	
18 Oct 22	1205											
Comments:	insup	Ficient	volum	1	NO 25	nele						





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

			Eial	4 D	stack	heet		Company:		MDU Hesi	kett	
MVTI	>		riei	uDa	atasi	ieet		Event:		Fall 2022		
			Gı	oundwate	er Assessm	ent		Sample ID	:	2-90		
2616 E. Broadway Ave, Bi	smarck, ND							Sampling I	Personal:		Jack -	
Phone: (701) 258-9	9720										17	
Weather Conditions		Temp:		°F	Wind:		@		Precip:	Sunny / Pa	artly Cloudy / Cloudy	
	WELL INFO	DRMATIO	N					SAIV	IPLING IN	IFORMATI	ON	
Well Locked?	YEŚ	(NO)]	Purging Me	ethod:	Bladder			Control Settings:	
Well Labeled?	YES	740]	Sampling N		Bladder			Purge:	
Casing Strait?	YES'	NO]	Dedicated	Equipment?	YES	NO		Recover:	
Grout Seal Intact?	YES	NO	Not \	isible]						PSI:	
Repairs Necessary?					1	Duplicate S	Sample?	YES	CNO	1		
Casing	g Diameter:	. 2	2"		1	Duplicate S	Sample ID:			1		
Water Level Be	fore Purge:	Bela	Pue	ft	1	<				_		
Total Dep	oth of Well:			ft	1		Bott	le List:		7		
W	ell Volume:			liters	1	1 Liter Raw		4- 1L Nitric		1		
Depth to To	p of Pump:	22.4	O	ft	1	500mL Nitri	c \	_				
Water Level Af	ter Sample:			ft	1	500mL Nitri	c (filtered)					
Measureme	nt Method:	Electric V	Water Level	Indicator]	250mL Sulfu	ıric					
					FIE	LD READIN	NGS					
Stabilization Parar		Temp.	Spec.	pH	DO	ORP	Turbidity	Water Level	Pumping	mL.	Appearance or Comment	
(3 Consecutiv	e)	(°C)	Cond.	рn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.	
Purge-Date	Time	±0.5*	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbi	
		Start of Wel	l Purge									
			/									
						T						
1					1							
i												
	Well St	abilized?	YES	NO				Total Vol	ume Purged	:	mL	
Sample Date	Time	Temp.	Spec.	pH			Turbidity				Appearance or Comment	
		(°C)	Cond.	P			(NTU)				Clarity, Color, Odor, Ect.	
18 Oct 22	1002	-										
Comments:	7, 4	2.2. 1. 1	/ 1	6.	S .	la						





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

440.77			Fiel	d Da	atasł	100+		Company:		MDU Hesl	kett
MVT			ilei	u D	acasi	icet		Event:		Fall 2022	
			Gr	oundwat	er Assessm	ent		Sample ID:			3-90
2616 E. Broadway Ave, B	ismarck, ND							Sampling F	ersonal:		Jak
Phone: (701) 258-	9720										1
Weather Condition	s:	Temp:		°F	Wind:		@		Precip:	Sunny / Pa	artly Cloudy / Cloudy
	WELL INFO	RMATION	1					SAM	PLING IN	IFORMATI	ON
Vell Locked?	YES	(NO)			7	Purging M	ethod:	Bladder		7	Control Settings:
Well Labeled?	¥ES	NO			7	Sampling I	/lethod:	Bladder		1	Purge:
Casing Strait?	YES	NO			7		Equipment?	(YES)	NO	1	Recover:
Grout Seal Intact?	YES	NO	Not V	isible	1					_	PSI:
Repairs Necessary?			-		1	Duplicate:	Sample?	YES	NO	7	
Casin	g Diameter:	2'			7	Duplicate :		_		1	
Water Level Be	fore Purge:	Below	Pung	ft	1					-	
Total De	pth of Well:	10		ft	7 -		Bottle	List:		7	
W	ell Volume:			liters	7	1 Liter Raw	_	4- 1L Nitric		1	
Depth to To	op of Pump:	20,5	2	ft	1	500mL Nitri	0				
Water Level Af	ter Sample:			ft	7	500mL Nitri	c (filtered)				
Measureme	ent Method:	Electric W	ater Level	Indicator	7	250mL Sulfi	ıric				
						LD READII	ıcs			-	
Stabilization Para	meters	Temp.	Spec.		DO	ORP	Turbidity		Pumping	mt.	Appearance or Commen
(3 Consecutiv	/e)	(°C)	Cond.	pH	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	, , ,	(ft)	mL/Min		clear, slightly turbid, turbi
		Start of Well	Purge		•						
				/							
	Well Sta	bilized?	YES	NO				Total Vol	ume Purged	:	mL
Sample Date	Time	Temp.	Spec.	pH			Turbidity				Appearance or Commen
·		(°C)	Cond.	pn.			(NTU)				Clarity, Color, Odor, Ect.
180172	1158	_									
Comments:	Prosens Str.	cland vo	1. 201	12	Sanyl						
	1050710		TOM	100	29144						



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



2800 Client: Montana-Dakota Utilities - Bismarck Account #:

2616 E. Broadway Ave, Bismarck, NI Phone: (701) 258-9720 /eather Conditions:							
	WELL II						
/ell Locked?	YES						
/ell Labeled?	<¥ES						
asing Strait?	YES						

MA

Field Datasheet

Groundwater Assessment

MDU Heskett Company: Fall 2022 Event: Sample ID: Sampling Personal:

Sunny / Partly Cloudy / Cloudy

Control Settings: Purge: う Recover: 5 く

Weather Condition	s:	Temp:	60°F	Wind
	WELL INFO	RMATION		
Well Locked?	YES	NO		7
Well Labeled?	<yes></yes>	NO		7
Casing Strait?	(YES	NO		7
Grout Seal Intact?	(YES)	NO	Not Visible	7
Repairs Necessary?				7
Casin	g Diameter:	2"		7
Water Level Be	efore Purge:	15.4	ft	7
Total De	pth of Well:		ft	7
W	/ell Volume:	_	liters	7
Depth to T	op of Pump:	_	ft	7
Water Level A	fter Sample:	15.81	ft	7
Measureme	ent Method:	Electric Wat	er Level Indicator	7

	SAMPLING INFORMATION							
Purging Method:	Bladder]					
Sampling Method:	Bladder		1	Pur				
Dedicated Equipment?	(YES)	NO	7	Rec				
			-	DCI-				

Duplicate Sample?
Duplicate Sample ID: YES <NO.

Bottle List:								
1 Liter Raw	4- 1L Nitric							
500mL Nitric								
500mL Nitric (filtere	d)							
250mL Sulfuric								

FIELD READING								
DO	Т	ORP	Tu					

Stabilization Par	ameters	Temp.	Spec.	Hq	DO	ORP	Turbidity	Water Level	Pumping	ml.	Appearance or Comment
(3 Consecut	tive)	(°C)	Cond.	ρn	(mg/L)	(mV)	(NTU)	water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
170c+22	1508	Start of We	ll Purge								
1+001	1528	9,91	5887	7.04	0.22	89.7	1.35	15.68	100,0	2000.0	Clear
	1533	9.88	5885	7.04	0,21	80.7	1.34	15.71	100.00	50.0	Clear
	1538	9,98	5886	7.05	0.17	76.9	1.05	15.73	1000	50.0	Cles
	1543	9.87	5892	7.05	0.12	75,7	1.15	15,75	100.0	500.0	Clear
	Well St	abilized?	(VEC)	NO				Total Vol	ume Purged	35/12.0	ml

Sample Date	Time	Temp.	Spec.	pH	Turbidity			Appearance or Comm	nent
Sample Date	Time	(°C)	Cond.	pri	(NTU)			Clarity, Color, Odor, I	Ect.
170ct22	1543	9.87	5892	7.05	1.15			C leav	

Comments:

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

Report Date: Friday, November 18, 2022 4:37:49 PM



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2800 Client: Montana-Dakota Utilities - Bismarck Account #:

MVTL	
616 E. Broadway Ave, Bismarck,	

Field Datasheet

Surface water Assessment

MDU Lewis & Clark Company: Event: Fall 2022 Sampling Personal:

Phone: (701) 258-9			95	Maria di		Dun o'un	Samuel Claude / Claude
Weather Conditions:	Temp:		°F	Wind:	 @	Precip:	Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Cor	mments
MW70		1437	2"	22.50			
MW33		1456	2"	44.10			
MW101		1440	2"	38,50			
MW102	(70422	1434	2"	19,28			
MW103	(700	1445	2"	35,68			
MW44R		1450	2"	28,91			
MW104		1500	2"	15,54			
MW105		1503	2"	13,53			

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

Friday, November 18, 2022 4:37:49 PM Report Date:

Original Sample QC Type	Analyte	Analysis Date	QC Result	Original Sample R	e Units	Spike Amou Sp	oike Resu Spil	ke % RecoviSpike	Duplicate Spike	Duplicate RPD (%)	Lower Control	Limi Upper Contro	I Limi⊧RPD Limit	t (%)
4458019 MS	Alkalinity, Total	10/20/2022 11:46:06	95.93	<20.5	mg/L	410	393	95.93				80	120	
4458019 MSD	Alkalinity, Total	10/20/2022 12:00:15	95.21	<20.5	mg/L				390	95.21	0.77	80	120	20
4470001 MS	Alkalinity, Total	10/20/2022 21:39:14	96.84	389	mg/L	410	786	96.84				80	120	
4470001 MSD	Alkalinity, Total	10/20/2022 21:51:17	81.87	389	mg/L				725	81.87	3.07	80	120	20
4519001 MS	Alkalinity, Total	10/20/2022 18:11:25	76.08	896	mg/L	410	1210	76.08				80	120	
4519001 MSD	Alkalinity, Total	10/20/2022 18:26:13	76.23	896	mg/L				1210	76.23	0.00	80	120	20
4555002 MS	Alkalinity, Total	10/21/2022 03:41:01	104.7	538	mg/L	410	967	104.7				80	120	
4555002 MSD	Alkalinity, Total	10/21/2022 03:53:08	83.85	538	mg/L				882	83.85	9.19	80	120	20
CRM	Alkalinity, Total	10/20/2022 10:17:14	93.51		mg/L	501	468	93.51				80	120	
LFB	Alkalinity, Total	10/21/2022 00:54:19	95.55		mg/L	410	392	95.55				90	110	
LFB	Alkalinity, Total	10/20/2022 15:06:02	93.74		mg/L	410	384	93.74				90	110	
LFB	Alkalinity, Total	10/20/2022 20:25:27	95		mg/L	410	390	95				90	110	
LFB	Alkalinity, Total	10/21/2022 05:04:23	95.86		mg/L	410	393	95.86				90	110	
LFB	Alkalinity, Total	10/20/2022 10:06:08	94.04		mg/L	410	386	94.04				90	110	
MB	Alkalinity, Total	10/20/2022 20:19:00	<20.5		mg/L as CaCO3									
MB	Alkalinity, Total	10/20/2022 14:59:18	<20.5		mg/L as CaCO3									
MB	Alkalinity, Total	10/21/2022 00:47:00	<50		mg/L as CaCO3									
MB	Alkalinity, Total	10/21/2022 04:57:00	<230		mg/L as CaCO3									
MB	Alkalinity, Total	10/20/2022 09:51:43	<20.5		mg/L as CaCO3									
4283001 SPK	Arsenic, Dissolved	11/03/2022 10:51:00	102	<0.002	mg/L	0.1	0.1016	102				75	125	
4311001 MS	Arsenic, Dissolved	11/03/2022 11:46:46	99.4		mg/L	0.4	0.513	99.4				75	125	
4311001 MSD	Arsenic, Dissolved	11/03/2022 11:50:56	100		mg/L				0.516	100	0.58	75	125	20
4311001 SPK	Arsenic, Dissolved	11/03/2022 11:42:00	95.3		mg/L	0.1	0.2101	95.3				75	125	
4458008 MS	Arsenic, Dissolved	11/03/2022 12:19:32	100	0.0032	mg/L	0.4	0.404	100				75	125	
4458008 MSD	Arsenic, Dissolved	11/03/2022 12:23:40	99.3	0.0032	mg/L				0.4	99.3	1.00	75	125	20
4458008 SPK	Arsenic, Dissolved	11/03/2022 12:15:00	105	0.0032	mg/L	0.1	0.1085	105				75	125	
4467001 MS	Arsenic, Dissolved	11/03/2022 13:04:37	102	<0.002	mg/L	0.4	0.41	102				75	125	
4467001 MSD	Arsenic, Dissolved	11/03/2022 13:08:45	101	<0.002	mg/L				0.405	101	1.23	75	125	20
4467004 MS	Arsenic, Dissolved	11/03/2022 13:34:18	98.6	<0.002	mg/L	0.4	0.394	98.6				75	125	
4467004 MSD	Arsenic, Dissolved	11/03/2022 13:38:27	99.3	<0.002	mg/L				0.397	99.3	0.76	75	125	20
4467004 SPK	Arsenic, Dissolved	11/03/2022 16:08:00	104	<0.002	mg/L	0.1	0.1041	104				75	125	
4467004 SPKD	Arsenic, Dissolved	11/03/2022 16:12:00	103	<0.002	mg/L				0.1028	103	1.26	75	125	20
4470002 MS	Arsenic, Dissolved	11/03/2022 14:06:57	96.3	0.0043	mg/L	0.4	0.389	96.3				75	125	
4470002 MSD	Arsenic, Dissolved	11/03/2022 14:11:04	99.5	0.0043	mg/L				0.402	99.5	3.29	75	125	20
4470002 SPK	Arsenic, Dissolved	11/03/2022 14:02:00	100	0.0043	mg/L	0.1	0.1046	100				75	125	
4506005 MS	Arsenic, Dissolved	11/03/2022 14:46:44	100		mg/L	0.4	0.4	100				75	125	
4506005 MSD	Arsenic, Dissolved	11/03/2022 14:50:52	102		mg/L				0.407	102	1.73	75	125	20
LFB-MS	Arsenic, Dissolved	11/03/2022 11:30:45	98.1		mg/L	0.1	0.0981	98.1				80	120	
LFB-MS	Arsenic, Dissolved	11/01/2022 11:21:00	99		mg/L	0.1	0.099	99				85	115	
LFB-MS	Arsenic, Dissolved	11/03/2022 12:48:12	100		mg/L	0.1	0.1	100				80	120	
MB	Arsenic, Dissolved	11/03/2022 12:44:04	<0.002		mg/L									
MB	Arsenic, Dissolved	11/03/2022 11:20:19	<0.002		mg/L									
MB	Arsenic, Dissolved	11/01/2022 11:11:00	<0.002		mg/L									
4283001 SPK	Barium, Dissolved	11/03/2022 10:51:00	94.9	<0.1	mg/L	0.1	0.1503	94.9				75	125	
4311001 MS	Barium, Dissolved		76.5		mg/L	0.4	0.486	76.5				75	125	
4311001 MSD	Barium, Dissolved	11/03/2022 11:50:56	88.5		mg/L				0.535	88.5	9.60	75	125	20
4311001 SPK	Barium, Dissolved	11/03/2022 11:42:00	93.6		mg/L	0.1	0.2742	93.6				75	125	
4458008 MS	Barium, Dissolved	11/03/2022 12:19:32	98.4	<0.5	mg/L	0.4	0.436	98.4				75	125	
4458008 MSD	Barium, Dissolved	11/03/2022 12:23:40	98.9	<0.5	mg/L				0.438	98.9	0.46	75	125	20
4458008 SPK	Barium, Dissolved	11/03/2022 12:15:00	105	<0.5	mg/L	0.1	0.1481	105				75	125	
4467001 MS	Barium, Dissolved	11/03/2022 13:04:37	94.3	0.0063	mg/L	0.4	0.384	94.3				75	125	
4467001 MSD	Barium, Dissolved	11/03/2022 13:08:45	93.7	0.0063	mg/L				0.382	93.7	0.52	75	125	20

4467004 MS	Barium, Dissolved	11/03/2022 13:34:18	98.9	<0.002	mg/L	0.4	0.395	98.9				75	125	
4467004 MSD	Barium, Dissolved	11/03/2022 13:38:27	98.7	<0.002	mg/L				0.395	98.7	0.00	75	125	20
4467004 SPK	Barium, Dissolved	11/03/2022 16:08:00	103	<0.002	mg/L	0.1	0.1027	103				75	125	
4467004 SPKD	Barium, Dissolved	11/03/2022 16:12:00	104	<0.002	mg/L				0.1036	104	0.87	75	125	20
4470002 MS	Barium, Dissolved	11/03/2022 14:06:57	95.9	0.0419	mg/L	0.4	0.425	95.9				75	125	
4470002 MSD	Barium, Dissolved	11/03/2022 14:11:04	97.3	0.0419	mg/L				0.431	97.3	1.40	75	125	20
4470002 SPK	Barium, Dissolved	11/03/2022 14:02:00	98.5	0.0419	mg/L	0.1	0.1404	98.5				75	125	
4506005 MS	Barium, Dissolved	11/03/2022 14:46:44	99.2		mg/L	0.4	0.483	99.2				75	125	
4506005 MSD	Barium, Dissolved	11/03/2022 14:50:52	96.6		mg/L				0.473	96.6	2.09	75	125	20
LFB-MS	Barium, Dissolved	11/03/2022 11:30:45	95		mg/L	0.1	0.095	95				80	120	
LFB-MS	Barium, Dissolved	11/03/2022 12:48:12	98		mg/L	0.1	0.098	98				80	120	
LFB-MS	Barium, Dissolved	11/01/2022 11:21:00	97.8		mg/L	0.1	0.0978	97.8				85	115	
MB	Barium, Dissolved	11/03/2022 12:44:04	<0.002		mg/L									
MB	Barium, Dissolved	11/01/2022 11:11:00	<0.002		mg/L									
MB	Barium, Dissolved	11/03/2022 11:20:19	<0.002		mg/L									
4470001 SPK	Boron, Dissolved	10/27/2022 11:57:28	89.7	0.96	mg/L	0.4	1.315	89.7				75	125	
4470001 SPKD	Boron, Dissolved	10/27/2022 11:59:23	86.2	0.96	mg/L				1.301	86.2	1.07	75	125	20
4470002 MS	Boron, Dissolved	10/27/2022 11:08:13	91.3	1.09	mg/L	0.4	1.459	91.3				70	130	
4470002 MSD	Boron, Dissolved	10/27/2022 11:10:08	87.8	1.09	mg/L				1.445	87.8	0.96	70	130	
LFB-OE	Boron, Dissolved	10/27/2022 10:37:47	99		mg/L	0.4	0.3961	99				85	115	
LFB-OE	Boron, Dissolved	10/27/2022 10:49:14	98.9		mg/L	0.4	0.3955	98.9				85	115	
MB	Boron, Dissolved	10/27/2022 10:47:14	<0.1		mg/L									
MB	Boron, Dissolved	10/27/2022 10:35:50	<0.1		mg/L									
4283001 SPK	Cadmium, Dissolved	11/03/2022 10:51:00	97	<0.0005	mg/L	0.1	0.097	97				75	125	
4311001 MS	Cadmium, Dissolved	11/03/2022 11:46:46	92.7		mg/L	0.4	0.371	92.7				75	125	
4311001 MSD	Cadmium, Dissolved	11/03/2022 11:50:56	94.2		mg/L				0.377	94.2	1.60	75	125	20
4311001 SPK	Cadmium, Dissolved	11/03/2022 11:42:00	87.1		mg/L	0.1	0.0871	87.1				75	125	
4458008 MS	Cadmium, Dissolved	11/03/2022 12:19:32	93.6	0.0007	mg/L	0.4	0.375	93.6				75	125	
4458008 MSD	Cadmium, Dissolved	11/03/2022 12:23:40	92	0.0007	mg/L				0.369	92	1.61	75	125	20
4458008 SPK	Cadmium, Dissolved	11/03/2022 12:15:00	92.1	0.0007	mg/L	0.1	0.0928	92.1				75	125	
4467001 MS	Cadmium, Dissolved	11/03/2022 13:04:37	93.2	<0.0005	mg/L	0.4	0.373	93.2				75	125	
4467001 MSD	Cadmium, Dissolved	11/03/2022 13:08:45	91.6	<0.0005	mg/L				0.366	91.6	1.89	75	125	20
4467004 MS	Cadmium, Dissolved	11/03/2022 13:34:18	94.6	<0.0005	mg/L	0.4	0.378	94.6				75	125	
4467004 MSD	Cadmium, Dissolved	11/03/2022 13:38:27	95.1	<0.0005	mg/L				0.38	95.1	0.53	75	125	20
4467004 SPK	Cadmium, Dissolved	11/03/2022 16:08:00	102	<0.0005	mg/L	0.1	0.1022	102				75	125	
4467004 SPKD	Cadmium, Dissolved	11/03/2022 16:12:00	100	<0.0005	mg/L				0.1002	100	1.98	75	125	20
4470002 MS	Cadmium, Dissolved	11/03/2022 14:06:57	92.3	<0.0005	mg/L	0.4	0.369	92.3				75	125	
4470002 MSD	Cadmium, Dissolved	11/03/2022 14:11:04	93.4	<0.0005	mg/L				0.374	93.4	1.34	75	125	20
4470002 SPK	Cadmium, Dissolved	11/03/2022 14:02:00	93.6	<0.0005	mg/L	0.1	0.0936	93.6				75	125	
4506005 MS	Cadmium, Dissolved	11/03/2022 14:46:44	96.3		mg/L	0.4	0.385	96.3				75	125	
4506005 MSD	Cadmium, Dissolved	11/03/2022 14:50:52	96.5		mg/L				0.386	96.5	0.26	75	125	20
LFB-MS	Cadmium, Dissolved	11/03/2022 12:48:12	98		mg/L	0.1	0.098	98				80	120	
LFB-MS	Cadmium, Dissolved	11/03/2022 11:30:45	95.6		mg/L	0.1	0.0956	95.6				80	120	
LFB-MS	Cadmium, Dissolved	11/01/2022 11:21:00	99.5		mg/L	0.1	0.0995	99.5				85	115	
MB	Cadmium, Dissolved	11/01/2022 11:11:00	<0.0005		mg/L									
MB	Cadmium, Dissolved	11/03/2022 11:20:19	< 0.0005		mg/L									
MB	Cadmium, Dissolved	11/03/2022 12:44:04	<0.0005		mg/L									
4479001 MS	Chloride	10/26/2022 12:38:48	116	96.1	mg/L	30	131	116				80	120	
4479001 MSD	Chloride	10/26/2022 12:39:58	116	96.1	mg/L				131	116	0.00	80	120	20
4519004 MS	Chloride	10/26/2022 14:30:22	94	5.3	mg/L	30	33.5	94				80	120	
4519004 MSD	Chloride	10/26/2022 14:31:34	94.1	5.3	mg/L				33.5	94.1	0.00	80	120	20
4594001 MS	Chloride	10/26/2022 15:05:50	101	4.5	mg/L	30	34.9	101				80	120	
4594001 MSD	Chloride	10/26/2022 15:07:01	101	4.5	mg/L				34.8	101	0.29	80	120	20
LFB	Chloride	10/26/2022 14:50:28	92.5		mg/L	30	27.7	92.5				90	110	

LFB	Chloride	10/26/2022 15:10:33	93.5		mg/L	30	28	93.5				90	110	
LFB	Chloride	10/26/2022 12:06:52	92.9		mg/L	30	27.9	92.9				90	110	
LFB	Chloride	10/26/2022 12:23:25	92.8		mg/L	30	27.8	92.8				90	110	
LFB	Chloride	10/26/2022 12:42:20	91.5		mg/L	30	27.5	91.5				90	110	
LFB	Chloride	10/26/2022 14:15:01	94		mg/L	30	28.2	94				90	110	
LFB	Chloride	10/26/2022 14:33:55	92.8		mg/L	30	27.8	92.8				90	110	
MB	Chloride	10/26/2022 14:49:17	<2.0		mg/L									
MB	Chloride	10/26/2022 14:32:44	<2.0		mg/L									
MB	Chloride	10/26/2022 15:09:22	<2.0		mg/L									
MB	Chloride	10/26/2022 14:13:50	<2.0		mg/L									
MB	Chloride	10/26/2022 12:41:09	<2.0		mg/L									
MB	Chloride	10/26/2022 12:22:15	<2.0		mg/L									
MB	Chloride	10/26/2022 12:05:41	<2.0		mg/L									
4283001 SPK	Chromium, Dissolved	11/03/2022 10:51:00	98.7	< 0.002	mg/L	0.1	0.0987	98.7				75	125	
4311001 MS	Chromium, Dissolved	11/03/2022 11:46:46	96.7		mg/L	0.4	0.479	96.7				75	125	
4311001 MSD	Chromium, Dissolved	11/03/2022 11:50:56	99.7		mg/L				0.491	99.7	2.47	75	125	20
4311001 SPK	Chromium, Dissolved	11/03/2022 11:42:00	103		mg/L	0.1	0.195	103				75	125	
4458008 MS	Chromium, Dissolved	11/03/2022 12:19:32	99.8	0.0072	mg/L	0.4	0.406	99.8				75	125	
4458008 MSD	Chromium, Dissolved	11/03/2022 12:23:40	98.1	0.0072	mg/L				0.4	98.1	1.49	75	125	20
4458008 SPK	Chromium, Dissolved	11/03/2022 12:15:00	113	0.0072	mg/L	0.1	0.1201	113				75	125	
4467001 MS	Chromium, Dissolved	11/03/2022 13:04:37	101	<0.002	mg/L	0.4	0.404	101				75	125	
4467001 MSD	Chromium, Dissolved	11/03/2022 13:08:45	97.9	<0.002	mg/L				0.392	97.9	3.02	75	125	20
4467004 MS	Chromium, Dissolved	11/03/2022 13:34:18	97.8	<0.002	mg/L	0.4	0.391	97.8				75	125	
4467004 MSD	Chromium, Dissolved	11/03/2022 13:38:27	97.3	<0.002	mg/L				0.389	97.3	0.51	75	125	20
4467004 SPK	Chromium, Dissolved	11/03/2022 16:08:00	103	<0.002	mg/L	0.1	0.1026	103				75	125	
4467004 SPKD	Chromium, Dissolved	11/03/2022 16:12:00	100	<0.002	mg/L				0.1002	100	2.37	75	125	20
4470002 MS	Chromium, Dissolved	11/03/2022 14:06:57	94.6	<0.002	mg/L	0.4	0.378	94.6				75	125	
4470002 MSD	Chromium, Dissolved	11/03/2022 14:11:04	96.8	<0.002	mg/L				0.387	96.8	2.35	75	125	20
4470002 SPK	Chromium, Dissolved	11/03/2022 14:02:00	102	<0.002	mg/L	0.1	0.1016	102				75	125	
4506005 MS	Chromium, Dissolved	11/03/2022 14:46:44	97.5		mg/L	0.4	0.39	97.5				75	125	
4506005 MSD	Chromium, Dissolved	11/03/2022 14:50:52			mg/L				0.394	98.4	1.02	75	125	20
LFB-MS	Chromium, Dissolved	11/03/2022 11:30:45	99.3		mg/L	0.1	0.0993	99.3				80	120	
LFB-MS	Chromium, Dissolved	11/01/2022 11:21:00	101		mg/L	0.1	0.101	101				85	115	
LFB-MS	Chromium, Dissolved	11/03/2022 12:48:12	103		mg/L	0.1	0.103	103				80	120	
MB	Chromium, Dissolved	11/03/2022 12:44:04	<0.002		mg/L									
MB	Chromium, Dissolved	11/03/2022 11:20:19	<0.002		mg/L									
MB	Chromium, Dissolved	11/01/2022 11:11:00	<0.002	0.04	mg/L	0.5	4.00	20				00	100	
4467001 MS-F	Fluoride	10/20/2022 17:45:15		0.84	mg/L	0.5	1.32	96	4.24	0.4	0.70	80	120	20
4467001 MSD-F 4470002 MS-F	Fluoride Fluoride	10/20/2022 17:51:14 10/20/2022 12:52:57	94 128	0.84	mg/L	0.5	0.64	128	1.31	94	0.76	80	120 120	20
4470002 MS-F 4470002 MSD-F			128	<0.1	mg/L	0.5	0.04	120	0.64	120	0.00	80		20
4555001 MS-F	Fluoride Fluoride	10/20/2022 12:58:54 10/21/2022 03:13:17	106	<0.1 0.29	mg/L	0.5	0.82	106	0.64	128	0.00	80 80	120 120	20
4555001 MSD-F	Fluoride	10/21/2022 03:13:17	110	0.29	mg/L mg/L	0.5	0.02	100	0.84	110	2.41	80	120	20
CRM-F	Fluoride	10/20/2022 10:57:00	102	0.23	mg/L	3.39	3.45	102	0.04	110	2.41	83.8	111	20
LFB-F	Fluoride	10/20/2022 15:25:16	100		mg/L	0.5	0.5	100				90	110	
LFB-F	Fluoride	10/20/2022 20:44:49	100		mg/L	0.5	0.5	100				90	110	
LFB-F	Fluoride	10/20/2022 11:10:18	104		mg/L	0.5	0.52	104				90	110	
LFB-F	Fluoride	10/21/2022 01:13:30	104		mg/L	0.5	0.52	104				90	110	
LFB-F	Fluoride	10/21/2022 05:23:54	102		mg/L	0.5	0.51	102				90	110	
MB-F	Fluoride	10/20/2022 11:03:51	<0.1		mg/L			- -					-	
MB-F	Fluoride	10/21/2022 05:17:36	<0.1		mg/L									
MB-F	Fluoride	10/21/2022 01:07:12	<0.1		mg/L									
MB-F	Fluoride	10/20/2022 20:38:31	<0.1		mg/L									
MB-F	Fluoride	10/20/2022 15:18:57	<0.1		mg/L									
					-									

4458014 SPK	Iron, Dissolved	11/01/2022 12:02:28	89.3	<0.1	mg/L	0.4	0.3572	89.3				75	125	
4458014 SPKD	Iron, Dissolved	11/01/2022 12:03:27	90.2	<0.1	mg/L				0.3606	90.2	0.95	75	125	20
4458021 SPK	Iron, Dissolved	11/01/2022 12:12:32	94.6	<0.1	mg/L	0.4	0.3785	94.6				75	125	
4458021 SPKD	Iron, Dissolved	11/01/2022 12:13:32	95.9	<0.1	mg/L				0.3834	95.9	1.29	75	125	20
4470001 SPK	Iron, Dissolved	11/01/2022 12:25:19	89.4	<0.1	mg/L	0.4	0.3577	89.4				75	125	
4470001 SPKD	Iron, Dissolved	11/01/2022 12:26:17	90.9	<0.1	mg/L				0.3636	90.9	1.64	75	125	20
4470002 MS	Iron, Dissolved	11/01/2022 10:25:00	117	1.15	mg/L	0.4	1.614	117				70	130	
4470002 MSD	Iron, Dissolved	11/01/2022 10:26:00	122	1.15	mg/L				1.634	122	1.23	70	130	
4594002 SPK	Iron, Dissolved	11/01/2022 12:37:49	94.4	0.32	mg/L	0.4	0.6991	94.4				75	125	
4594002 SPKD	Iron, Dissolved	11/01/2022 12:38:48	91.9	0.32	mg/L				0.6892	91.9	1.43	75	125	20
LFB-OE	Iron, Dissolved	11/01/2022 10:09:22	103		mg/L	0.4	0.4132	103				85	115	
LFB-OE	Iron, Dissolved	11/01/2022 10:22:25	102		mg/L	0.4	0.4071	102				85	115	
MB	Iron, Dissolved	11/01/2022 10:08:08	<0.1		mg/L									
MB	Iron, Dissolved	11/01/2022 10:21:09	<0.1		mg/L									
4283001 SPK	Lead, Dissolved	11/03/2022 10:51:00	95.1	<0.0005	mg/L	0.1	0.0951	95.1				75	125	
4311001 MS	Lead, Dissolved	11/03/2022 11:46:46	86.3		mg/L	0.4	0.345	86.3				75	125	
4311001 MSD	Lead, Dissolved	11/03/2022 11:50:56	89.9		mg/L				0.36	89.9	4.26	75	125	20
4311001 SPK	Lead, Dissolved	11/03/2022 11:42:00	85.8		mg/L	0.1	0.0858	85.8				75	125	
4458008 MS	Lead, Dissolved	11/03/2022 12:19:32	91.9	0.0027	mg/L	0.4	0.37	91.9				75	125	
4458008 MSD	Lead, Dissolved	11/03/2022 12:23:40	90.6	0.0027	mg/L				0.365	90.6	1.36	75	125	20
4458008 SPK	Lead, Dissolved	11/03/2022 12:15:00	93.1	0.0027	mg/L	0.1	0.0958	93.1				75	125	
4467001 MS	Lead, Dissolved	11/03/2022 13:04:37	91.3	<0.0005	mg/L	0.4	0.365	91.3				75	125	
4467001 MSD	Lead, Dissolved	11/03/2022 13:08:45	90.4	<0.0005	mg/L				0.362	90.4	0.82	75	125	20
4467004 MS	Lead, Dissolved	11/03/2022 13:34:18	98	<0.0005	mg/L	0.4	0.392	98				75	125	
4467004 MSD	Lead, Dissolved	11/03/2022 13:38:27	98.2	<0.0005	mg/L				0.393	98.2	0.25	75	125	20
4467004 SPK	Lead, Dissolved	11/03/2022 16:08:00	101	<0.0005	mg/L	0.1	0.1008	101				75	125	
4467004 SPKD	Lead, Dissolved	11/03/2022 16:12:00	101	<0.0005	mg/L				0.1013	101	0.49	75	125	20
4470002 MS	Lead, Dissolved	11/03/2022 14:06:57	93.4	0.0008	mg/L	0.4	0.374	93.4				75	125	
4470002 MSD	Lead, Dissolved	11/03/2022 14:11:04	95.2	0.0008	mg/L				0.381	95.2	1.85	75	125	20
4470002 SPK	Lead, Dissolved	11/03/2022 14:02:00	94.5	0.0008	mg/L	0.1	0.0953	94.5				75	125	
4506005 MS	Lead, Dissolved	11/03/2022 14:46:44	97.9		mg/L	0.4	0.392	97.9				75	125	
4506005 MSD	Lead, Dissolved	11/03/2022 14:50:52	97.2		mg/L				0.389	97.2	0.77	75	125	20
LFB-MS	Lead, Dissolved	11/01/2022 11:21:00	97.2		mg/L	0.1	0.0972	97.2				85	115	
LFB-MS	Lead, Dissolved	11/03/2022 11:30:45	94.6		mg/L	0.1	0.0946	94.6				80	120	
LFB-MS	Lead, Dissolved	11/03/2022 12:48:12	97.7		mg/L	0.1	0.0977	97.7				80	120	
MB	Lead, Dissolved	11/01/2022 11:11:00	<0.0005		mg/L									
MB	Lead, Dissolved	11/03/2022 11:20:19	<0.0005		mg/L									
MB	Lead, Dissolved	11/03/2022 12:44:04	<0.0005		mg/L									
4049002 PDS	Magnesium	10/25/2022 12:08:18	101	32.2	mg/L	100	133.3	101				75	125	
4049002 PDSD	Magnesium	10/25/2022 12:09:06	101	32.2	mg/L				133.1	101	0.15	75	125	20
4278001 PDS	Magnesium	10/25/2022 12:25:24	96.3		mg/L	100	145.6	96.3				75	125	
4278001 PDSD	Magnesium				mg/L				147.3	98	1.16	75	125	20
4283001 PDS	Magnesium	10/25/2022 12:48:41	95.9	24.4	mg/L	100	120.3	95.9				75	125	
4283001 PDSD	Magnesium	10/25/2022 12:49:31	96.4	24.4	mg/L				120.8	96.4	0.42	75	125	20
4284001 PDS	Magnesium	10/25/2022 12:55:26	99.6	<1	mg/L	100	99.55	99.6	400.0	400		75 	125	
4284001 PDSD	Magnesium	10/25/2022 12:56:29	100	<1	mg/L	4000	4000	400	100.3	100	0.75	75 	125	20
4311001 PDS	Magnesium	10/25/2022 13:10:00	102	<10	mg/L	1000	1023	102	4000	404	4.00	75 	125	
4311001 PDSD	Magnesium	10/25/2022 13:11:00	101	<10	mg/L				1009	101	1.38	75	125	20
4448001 DUP	Magnesium	10/25/2022 13:13:23	168.0	168	mg/L						0.00			20
4458008 DUP	Magnesium	10/25/2022 13:22:52	625.2	619	mg/L	500	744.0	00.5			1.00	75	405	20
4458009 PDS	Magnesium	10/25/2022 13:24:00	98.5	219	mg/L	500	711.2	98.5	747.0	00.0	0.02	75 75	125	20
4458009 PDSD 4458014 DUP	Magnesium	10/25/2022 13:25:00 10/25/2022 13:32:17	99.8 65.50	219	mg/L				717.8	99.8	0.92 4.53	75	125	20 20
4458014 DOP 4458021 PDS	Magnesium	10/25/2022 13:32:17	98.9	62.6 5.87	mg/L	100	104.8	98.9			4.03	75	125	20
44000ZT FD3	Magnesium	10/20/2022 13.40.33	3U.3	J.01	mg/L	100	104.0	30.3 				70	120	

4458021 PDSD	Magnesium	10/25/2022 13:41:32	99.2	5.87	mg/L				105.1	99.2	0.29	75	125	20
4467002 DUP	Magnesium	10/25/2022 13:48:43	546.7	529	mg/L						3.29			20
4470001 DUP	Magnesium	10/25/2022 13:51:59	75.75	77.6	mg/L						2.41			20
4470002 PDS	Magnesium	10/25/2022 13:53:32	96.5	58.6	mg/L	100	155.1	96.5				75	125	
4470002 PDSD	Magnesium	10/25/2022 13:54:25	97	58.6	mg/L				155.6	97	0.32	75	125	20
4477001 PDS	Magnesium		99.2		mg/L	100	99.22	99.2				75	125	
4477001 PDSD	Magnesium	10/25/2022 13:59:23	99.6		mg/L				99.55	99.6	0.33	75	125	20
4506006 DUP	Magnesium	10/25/2022 14:06:43	25.36	25.4	mg/L						0.16			20
LFB-MI	Magnesium	10/25/2022 13:08:42	102		mg/L	100	102.5	102				85	115	
LFB-MI	Magnesium	10/25/2022 13:36:29	104		mg/L	100	103.6	104				85	115	
MB	Magnesium	10/25/2022 13:07:50	<1		mg/L							33		
MB	Magnesium	10/25/2022 13:35:37	<1		mg/L									
4458014 SPK	Manganese, Dissolved		83.1	0.36	mg/L	0.4	0.6921	83.1				75	125	
4458014 SPKD	Manganese, Dissolved		81.4	0.36	mg/L	0. .	0.002	00	0.685	81.4	1.03	75	125	20
4458021 SPK	Manganese, Dissolved		94.7	<0.05	mg/L	0.4	0.3788	94.7	0.000	• • • • • • • • • • • • • • • • • • • •		75	125	
4458021 SPKD	Manganese, Dissolved	11/01/2022 12:13:32	95.5	<0.05	mg/L			•	0.3819	95.5	0.82	75	125	20
4470001 SPK	Manganese, Dissolved		90.6	<0.05	mg/L	0.4	0.3625	90.6	0.00.0	00.0	0.02	75	125	
4470001 SPKD	Manganese, Dissolved		93.9	<0.05	mg/L	0	0.0020	00.0	0.3755	93.9	3.52	75	125	20
4470002 MS	Manganese, Dissolved	11/01/2022 10:25:00	84	0.23	mg/L	0.4	0.5701	84	0.0700	00.0	0.02	70	130	20
4470002 MSD	Manganese, Dissolved		84.2	0.23	mg/L	0	0.0101	0.	0.571	84.2	46.10	70	130	20
4594002 SPK	Manganese, Dissolved	11/01/2022 12:37:49	98.3	0.10	mg/L	0.4	0.4976	98.3	0.07 1	01.2	10.10	75	125	20
4594002 SPKD	Manganese, Dissolved	11/01/2022 12:38:48	96.6	0.10	mg/L	0.1	0.1070	00.0	0.4907	96.6	1.40	75	125	20
LFB-OE	Manganese, Dissolved	11/01/2022 10:09:22	104	0.10	mg/L	0.4	0.414	104	0.1007	00.0		85	115	20
LFB-OE	Manganese, Dissolved	11/01/2022 10:22:25	103		mg/L	0.4	0.4118	103				85	115	
MB	Manganese, Dissolved	11/01/2022 10:08:08	<0.05		mg/L	0.4	0.4110	100				00	110	
MB	Manganese, Dissolved	11/01/2022 10:21:09	<0.05		mg/L									
4467004 MS	Mercury, Dissolved	10/28/2022 13:46:00	90.6	<0.0002	mg/L	0.002	0.0018	90.6				70	130	
4467004 MSD	Mercury, Dissolved		91.8	<0.0002	mg/L	0.002	0.0010	30.0	0.0018	91.8	0.00	70	130	20
LFB	Mercury, Dissolved	10/28/2022 13:46:00	98	10.0002	mg/L	0.002	0.002	98	0.0010	31.0	0.00	85	115	20
LFB	Mercury, Dissolved	11/15/2022 10:45:00	103		mg/L	0.002	0.0021	103				85	115	
LFB	Mercury, Dissolved	11/15/2022 10:45:00	101			0.002	0.0021	101				85	115	
LRB	Mercury, Dissolved	11/15/2022 10:45:00	<0.0002		mg/L mg/L	0.002	0.002	101				00	110	
LRB	Mercury, Dissolved	10/28/2022 13:46:00	<0.0002		mg/L									
MB	Mercury, Dissolved	11/15/2022 10:45:00	<0.0002		mg/L									
4283001 SPK	Molybdenum, Dissolved	11/03/2022 10:45:00	105	<0.002		0.1	0.1048	105				75	125	
4311001 MS	Molybdenum, Dissolved		82.1	<0.002	mg/L mg/L	0.4	1.63	82.1				75 75	125	
4311001 MSD	Molybdenum, Dissolved		84.5			0.4	1.03	02.1	1.64	84.5	0.61	75	125	20
4311001 MSD 4311001 SPK	Molybdenum, Dissolved		56.6		mg/L	0.1	1.357	56.6	1.04	04.5	0.01	75 75	125	20
4458008 MS	Molybdenum, Dissolved	11/03/2022 11:42:00	105		mg/L mg/L	0.4	0.426	105				75 75	125	
4458008 MSD	Molybdenum, Dissolved	11/03/2022 12:19:32	103			0.4	0.420	103	0.414	102	2.86	75	125	20
4458008 NISD 4458008 SPK	Molybdenum, Dissolved		115		mg/L	0.1	0.1203	115	0.414	102	2.00	75 75	125	20
4467001 MS	Molybdenum, Dissolved	11/03/2022 12:15:00	106	<0.002	mg/L	0.1 0.4	0.1203	106				75 75	125	
4467001 MSD	Molybdenum, Dissolved	11/03/2022 13:04:37	106	<0.002	mg/L mg/L	0.4	0.420	100	0.423	106	0.71	75 75	125	20
4467001 MSD	Molybdenum, Dissolved		96.5	<0.002		0.4	0.386	96.5	0.423	100	0.71	75 75	125	20
4467004 MSD	Molybdenum, Dissolved	11/03/2022 13:38:27	97	<0.002	mg/L	0.4	0.300	90.5	0.388	97	0.52	75 75	125	20
4467004 MSD 4467004 SPK	Molybdenum, Dissolved	11/03/2022 15:38:27	100	<0.002	mg/L mg/L	0.1	0.1004	100	0.388	91	0.52	75 75	125	20
4467004 SPKD	Molybdenum, Dissolved		99.3	<0.002		0.1	0.1004	100	0.0993	99.3	1.10	75 75	125	20
4470002 MS	Molybdenum, Dissolved	11/03/2022 14:06:57	99.3 96.6	0.0428	mg/L mg/L	0.4	0.429	96.6	0.0333	<i>33.</i> 3	1.10	75 75	125	20
4470002 MSD	Molybdenum, Dissolved		97.9	0.0428		0.4	U. 4 23	30.0	0.434	97.9	1.16	75 75	125	20
4470002 MSD 4470002 SPK	Molybdenum, Dissolved	11/03/2022 14:11:04	97.9 101	0.0428	mg/L	0.1	0.1437	101	0.434	ਰ। .ਚ	1.10	75 75	125	20
4470002 SPK 4506005 MS	Molybdenum, Dissolved		99.7	0.0420	mg/L	0.1	0.1437	99.7				75 75	125	
4506005 MSD	Molybdenum, Dissolved	11/03/2022 14:40:44	100		mg/L	0.4	0.333	33.1	0.401	100	0.50	75 75	125	20
LFB-MS	Molybdenum, Dissolved	11/03/2022 14:50:52	98.7		mg/L mg/L	0.1	0.0987	98.7	0.401	100	0.50	75 80	120	20
LFB-MS	Molybdenum, Dissolved	11/03/2022 11:30:45	104		mg/L	0.1	0.0987	104				85	120	
LI D-IVIO	worybacham, bissolvea	11/01/2022 11.21.00	1 V T		mg/L	0.1	U. 1U 1	104					110	

LFB-MS	Molybdenum, Dissolved	11/03/2022 12:48:12	102		mg/L	0.1	0.102	102				80	120	
MB	•	11/03/2022 11:20:19	<0.002		mg/L									
MB	Molybdenum, Dissolved	11/01/2022 11:11:00	<0.002		mg/L									
MB	•	11/03/2022 12:44:04	<0.002		mg/L									
4223001 MS	Nitrate + Nitrite as N	10/20/2022 09:08:10	96	<0.2	mg/L	1	0.96	96				90	110	
4223001 MSD	Nitrate + Nitrite as N		96	<0.2	mg/L				0.96	96	0.00	90	110	20
4284001 MS	Nitrate + Nitrite as N		94	<0.2	mg/L	1	0.94	94	0.00		0.00	90	110	_0
4284001 MSD	Nitrate + Nitrite as N		95	<0.2	mg/L	•	0.01	01	0.95	95	1.06	90	110	20
4286001 MS	Nitrate + Nitrite as N	10/20/2022 09:45:48	91	<0.2	mg/L	1	0.91	91	0.00	00	1.00	90	110	20
4286001 MSD	Nitrate + Nitrite as N	10/20/2022 09:46:53	90	<0.2	mg/L	'	0.51	31	0.9	90	1.10	90	110	20
4458002 MS	Nitrate + Nitrite as N	10/20/2022 09:40:33	74	353		100	427	74	0.9	30	1.10	90	110	20
4458002 MSD	Nitrate + Nitrite as N	10/20/2022 10:04:27	74 76	353	mg/L	100	421	74	429	76	0.47	90	110	20
4458013 MS	Nitrate + Nitrite as N		68	<0.2	mg/L	1	0.68	68	429	70	0.47	90	110	20
4458013 MSD	Nitrate + Nitrite as N	10/20/2022 10:21:04	68		mg/L	ı	0.00	00	0.68	60	0.00	90	110	20
4467004 MS	Nitrate + Nitrite as N	10/20/2022 10:22:10		<0.2	mg/L	1	0.05	0E	0.00	68	0.00			20
			95	<0.2	mg/L	ı	0.95	95	0.00	00	4.05	90	110	00
4467004 MSD	Nitrate + Nitrite as N	10/20/2022 10:39:53	96	<0.2	mg/L	4	0.00	22	0.96	96	1.05	90	110	20
4483002 MS	Nitrate + Nitrite as N	10/20/2022 10:55:23	93	1.09	mg/L	1	2.02	93	0.04	.=		90	110	
4483002 MSD	Nitrate + Nitrite as N	10/20/2022 10:56:29	95	1.09	mg/L	4	0.00	00	2.04	95	0.99	90	110	20
4506001 MS	Nitrate + Nitrite as N		83	<0.2	mg/L	1	0.83	83				90	110	
4506001 MSD	Nitrate + Nitrite as N		83	<0.2	mg/L				0.83	83	0.00	90	110	20
4506003 MS	Nitrate + Nitrite as N		83	<0.2	mg/L	1	0.83	83				90	110	
4506003 MSD	Nitrate + Nitrite as N		85	<0.2	mg/L				0.85	85	2.38	90	110	20
LFB	Nitrate + Nitrite as N	10/20/2022 10:07:49	96		mg/L	0.5	0.48	96				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 10:25:31	96		mg/L	0.5	0.48	96				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 10:42:09	98		mg/L	0.5	0.49	98				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 11:00:58	94		mg/L	0.5	0.47	94				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 09:49:09	94		mg/L	0.5	0.47	94				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 11:12:03	96		mg/L	0.5	0.48	96				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 09:15:57	96		mg/L	0.5	0.48	96				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 08:54:55	96		mg/L	0.5	0.48	96				90	110	
LFB	Nitrate + Nitrite as N	10/20/2022 09:32:33	96		mg/L	0.5	0.48	96				90	110	
4283001 MS	Phosphorus as P	10/24/2022 08:56:12	103	0.10	mg/L	1	1.13	103				90	110	
4283001 MSD	Phosphorus as P	10/24/2022 08:57:18	106	0.10	mg/L				1.16	106	2.62	90	110	20
4409002 MS	Phosphorus as P	10/24/2022 09:13:44	101	<0.1	mg/L	1	1.01	101				90	110	
4409002 MSD	Phosphorus as P	10/24/2022 09:14:50	103	<0.1	mg/L				1.03	103	1.96	90	110	20
4458002 MS	Phosphorus as P	10/24/2022 09:32:21	101	<0.1	mg/L	1	1.01	101				90	110	
4458002 MSD	Phosphorus as P	10/24/2022 09:33:27	104	<0.1	mg/L				1.04	104	2.93	90	110	20
4458025 MS	Phosphorus as P	10/24/2022 09:48:46	101	<0.1	mg/L	1	1.01	101				90	110	
4458025 MSD	Phosphorus as P	10/24/2022 09:49:52	105	<0.1	mg/L				1.05	105	3.88	90	110	20
4470001 MS	Phosphorus as P	10/24/2022 10:07:23	108	<0.1	mg/L	1	1.08	108				90	110	
4470001 MSD	Phosphorus as P	10/24/2022 10:08:29	111	<0.1	mg/L				1.11	111	2.74	90	110	20
4521002 MS	Phosphorus as P	10/24/2022 10:18:18	90	7.53	mg/L	1	8.43	90				90	110	
4521002 MSD	Phosphorus as P	10/24/2022 10:19:25	114	7.53	mg/L				8.67	114	2.81	90	110	20
LFB	Phosphorus as P	10/24/2022 08:44:10	98		mg/L	0.5	0.49	98				90	110	
LFB	Phosphorus as P	10/24/2022 09:17:02	108		mg/L	0.5	0.54	108				90	110	
LFB	Phosphorus as P	10/24/2022 09:52:04	90		mg/L	0.5	0.45	90				90	110	
MB	Phosphorus as P	10/24/2022 09:15:55	<0.1		mg/L									
MB	Phosphorus as P	10/24/2022 09:50:58	<0.1		mg/L									
MB	Phosphorus as P	10/24/2022 08:43:03	<0.1		mg/L									
4049002 PDS	Potassium	10/25/2022 12:08:18	103		mg/L	100	109.9	103				75	125	
4049002 PDSD	Potassium	10/25/2022 12:09:06	103		mg/L				110.3	103	0.36	75	125	20
4278001 PDS	Potassium	10/25/2022 12:25:24	101		mg/L	100	104.7	101				75	125	
4278001 PDSD	Potassium	10/25/2022 12:26:11	102		mg/L				106	102	1.23	75	125	20
4283001 PDS		10/25/2022 12:48:41	98.1	5.29	mg/L	100	103.4	98.1				75	125	
					-									

4283001 PDSD	Potassium	10/25/2022 12:49:31	100	5.29	mg/L				105.6	100	2.11	75	125	20
4284001 PDS	Potassium		101	1.65	mg/L	100	102.5	101				75	125	
4284001 PDSD	Potassium	10/25/2022 12:56:29	101	1.65	mg/L				102.8	101	0.29	75	125	20
4311001 PDS	Potassium	10/25/2022 13:10:00	101	162	mg/L	1000	1174	101				75	125	
4311001 PDSD	Potassium	10/25/2022 13:11:00	99.2	162	mg/L				1154	99.2	1.72	75	125	20
4448001 DUP	Potassium	10/25/2022 13:13:23	17.95	18.0	mg/L						0.28			20
4458008 DUP	Potassium	10/25/2022 13:22:52	34.40	34.2	mg/L						0.58			20
4458009 PDS	Potassium	10/25/2022 13:24:00	102	21.2	mg/L	500	531.5	102			0.00	75	125	
4458009 PDSD	Potassium	10/25/2022 13:25:00	104	21.2	mg/L		001.0		541.5	104	1.86	75	125	20
4458014 DUP	Potassium		11.71	11.5	mg/L				011.0	101	1.81	. 0	.20	20
4458021 PDS	Potassium	10/25/2022 13:40:35	100	4.09	mg/L	100	104.1	100				75	125	
4458021 PDSD	Potassium	10/25/2022 13:41:32	102	4.09	mg/L	100	101.1	100	105.8	102	1.62	75	125	20
4467002 DUP	Potassium	10/25/2022 13:48:43	5.280	5.17	mg/L				100.0	102	2.10	70	120	20
4470001 DUP	Potassium	10/25/2022 13:51:59	2.720	2.79	mg/L						2.54			20
4470001 BOI 4470002 PDS	Potassium	10/25/2022 13:53:32	102	8.83	mg/L	100	111.3	102			2.04	75	125	20
4470002 PDSD	Potassium	10/25/2022 13:54:25	102	8.83	mg/L	100	111.0	102	111.1	102	0.18	75	125	20
4477001 PDS	Potassium	10/25/2022 13:54:23	99.4	0.00	mg/L	100	101.1	99.4	111.1	102	0.10	75 75	125	20
4477001 PDSD	Potassium	10/25/2022 13:59:23	99.6		mg/L	100	101.1	33.4	101.3	99.6	0.20	75 75	125	20
4506006 DUP	Potassium	10/25/2022 13:39:23	7.990	8.12	mg/L				101.5	33.0	1.61	73	123	20
LFB-MI	Potassium	10/25/2022 13:08:42	103	0.12	mg/L	100	103.4	103			1.01	85	115	20
LFB-MI	Potassium	10/25/2022 13:36:29	105		mg/L	100	105.4	105				85	115	
MB	Potassium	10/25/2022 13:30:29	<1		mg/L	100	105.1	103				65	113	
MB	Potassium	10/25/2022 13:35:37	<1											
4283001 SPK	Selenium, Dissolved	11/03/2022 10:51:00	93.4	<0.005	mg/L	0.1	0.0934	93.4				75	125	
4311001 MS	Selenium, Dissolved	11/03/2022 10:51:00	98	<0.005	mg/L	0.1 0.4	0.0934	93.4				75 75	125	
4311001 MSD	Selenium, Dissolved	11/03/2022 11:40:40	102		mg/L	0.4	0.470	90	0.49	102	2.90	75 75	125	20
4311001 MSD 4311001 SPK	Selenium, Dissolved	11/03/2022 11:30:36	95.2		mg/L	0.1	0.179	95.2	0.49	102	2.90	75 75	125	20
4458008 MS	Selenium, Dissolved		97.2	0.8087	mg/L	0.1	1.2							
4458008 MSD	Selenium, Dissolved	11/03/2022 12:19:32	102	0.8087	mg/L	0.4	1.2	97.2	1.22	102	1.65	75 75	125	20
					mg/L	0.1	0.0164	100	1.22	102	1.00		125	20
4458008 SPK	Selenium, Dissolved	11/03/2022 12:15:00	108	0.8087	mg/L	0.1	0.9164	108				75 75	125	
4467001 MS 4467001 MSD	Selenium, Dissolved Selenium, Dissolved	11/03/2022 13:04:37 11/03/2022 13:08:45	93.2	0.0334	mg/L	0.4	0.408	94.2	0.404	93.2	0.00	75 75	125	20
4467001 MSD 4467004 MS			97.7	0.0334	mg/L	0.4	0.201	97.7	0.404	93.2	0.98	75 75	125	20
	Selenium, Dissolved		98.4	<0.005	mg/L	0.4	0.391	97.7	0.202	98.4	0.51	75 75	125	20
4467004 MSD	Selenium, Dissolved	11/03/2022 13:38:27 11/03/2022 16:08:00		<0.005	mg/L	0.1	0.1021	102	0.393	90.4	0.51	75 75	125	20
4467004 SPK 4467004 SPKD	Selenium, Dissolved		103	<0.005	mg/L	0.1	0.1031	103	0.4000	400	0.00	75 75	125	20
	Selenium, Dissolved	11/03/2022 16:12:00 11/03/2022 14:06:57	102	<0.005	mg/L	0.4	0.202	00.4	0.1022	102	0.88	75 75	125	20
4470002 MS	Selenium, Dissolved		96.1	0.0086	mg/L	0.4	0.393	96.1	0.204	05.0	0.54	75 75	125	20
4470002 MSD	Selenium, Dissolved	11/03/2022 14:11:04	95.6	0.0086	mg/L	0.1	0.4020	05.0	0.391	95.6	0.51	75 75	125	20
4470002 SPK	Selenium, Dissolved	11/03/2022 14:02:00	95.2 101	0.0086	mg/L	0.1	0.1038	95.2				75 75	125	
4506005 MS	Selenium, Dissolved	11/03/2022 14:46:44			mg/L	0.4	0.403	101	0.400	404	0.00	75 75	125	20
4506005 MSD	Selenium, Dissolved	11/03/2022 14:50:52	101		mg/L	0.4	0.0070	07.0	0.403	101	0.00	75	125	20
LFB-MS	Selenium, Dissolved		97.8		mg/L	0.1	0.0978	97.8				85	115	
LFB-MS	Selenium, Dissolved		92.7 97		mg/L	0.1	0.0927	92.7				80	120	
LFB-MS	Selenium, Dissolved	11/03/2022 12:48:12	_		mg/L	0.1	0.097	97				80	120	
MB	Selenium, Dissolved	11/03/2022 11:20:19	<0.005		mg/L									
MB	Selenium, Dissolved	11/03/2022 12:44:04	<0.005		mg/L									
MB	Selenium, Dissolved	11/01/2022 11:11:00	<0.005	-0.0005	mg/L	0.4	0.0007	00.7				75	105	
4283001 SPK	Silver, Dissolved	11/03/2022 10:51:00	98.7	<0.0005	mg/L	0.1	0.0987	98.7				75 75	125	
4311001 MS	Silver, Dissolved	11/03/2022 11:46:46	40.9		mg/L	0.4	0.164	40.9	0.404	40.0	4.05	75 75	125	20
4311001 MSD	Silver, Dissolved	11/03/2022 11:50:56	40.2		mg/L	2.1	0.0070	07.0	0.161	40.2	1.85	75 75	125	20
4311001 SPK	Silver, Dissolved		87.9	0.000=	mg/L	0.1	0.0879	87.9				75 75	125	
4458008 MS	Silver, Dissolved		44.2	<0.0005	mg/L	0.4	0.177	44.2	0.400	40	5 00	75 75	125	00
4458008 MSD	Silver, Dissolved	11/03/2022 12:23:40	42	<0.0005	mg/L	^ .	0.000=	=	0.168	42	5.22	75 75	125	20
4458008 SPK	Silver, Dissolved	11/03/2022 12:15:00	93.5	<0.0005	mg/L	0.1	0.0935	93.5				75	125	

4467001 MS	Silver, Dissolved	11/03/2022 13:04:37	42.4	<0.0005	mg/L	0.4	0.17	42.4				75	125	
4467001 MSD	Silver, Dissolved	11/03/2022 13:08:45		<0.0005	mg/L				0.171	42.6	0.59	75	125	20
4467004 MS	Silver, Dissolved	11/03/2022 13:34:18	41.2	<0.0005	mg/L	0.4	0.165	41.2				75	125	
4467004 MSD	Silver, Dissolved	11/03/2022 13:38:27	43	<0.0005	mg/L				0.172	43	4.15	75	125	20
4467004 SPK	Silver, Dissolved	11/03/2022 16:08:00	98.4	<0.0005	mg/L	0.1	0.0984	98.4				75	125	
4467004 SPKD	Silver, Dissolved	11/03/2022 16:12:00	101	<0.0005	mg/L				0.101	101	2.61	75	125	20
4470002 MS	Silver, Dissolved	11/03/2022 14:06:57	40.5	<0.0005	mg/L	0.4	0.162	40.5				75	125	
4470002 MSD	Silver, Dissolved	11/03/2022 14:11:04		<0.0005	mg/L	.	00=		0.168	41.9	3.64	75	125	20
4470002 SPK	Silver, Dissolved	11/03/2022 14:02:00	96.5	<0.0005	mg/L	0.1	0.0965	96.5				75	125	•
4506005 MS	Silver, Dissolved	11/03/2022 14:46:44		10.0000	mg/L	0.4	0.175	43.8				75	125	
4506005 MSD	Silver, Dissolved	11/03/2022 14:50:52			mg/L	0.1	0.110	10.0	0.169	42.4	3.49	75	125	20
LFB-MS	Silver, Dissolved	11/01/2022 11:21:00			mg/L	0.1	0.104	104	0.100	12.1	0.10	85	115	20
LFB-MS	Silver, Dissolved	11/03/2022 11:30:45			mg/L	0.1	0.101	101				80	120	
LFB-MS	Silver, Dissolved	11/03/2022 12:48:12			mg/L	0.1	0.103	103				80	120	
MB	Silver, Dissolved	11/03/2022 11:20:19	< 0.0005		mg/L	0.1	0.100	100				00	120	
MB	Silver, Dissolved	11/03/2022 12:44:04	<0.0005		mg/L									
MB	Silver, Dissolved	11/01/2022 11:11:00	<0.0005		mg/L									
4049002 PDS	Sodium	10/25/2022 12:08:18			mg/L	100	133.7	101				75	125	
4049002 PDSD	Sodium	10/25/2022 12:08:18	101		mg/L	100	100.1	101	134.6	102	0.67	75 75	125	20
4278001 PDS	Sodium	10/25/2022 12:05:00	102	15.8	mg/L	100	117.6	102	134.0	102	0.07	75 75	125	20
4278001 PDSD	Sodium	10/25/2022 12:25:24	102	15.8		100	117.0	102	118.3	102	0.59	75 75	125	20
4283001 PDS	Sodium	10/25/2022 12:28:41	91.9	91.5	mg/L mg/L	100	183.4	91.9	110.3	102	0.59	75 75	125	20
4283001 PDSD	Sodium	10/25/2022 12:49:31	92.7	91.5		100	103.4	91.9	184.2	92.7	0.44	75 75	125	20
4284001 PDS	Sodium	10/25/2022 12:49:31	78.2	352	mg/L	100	430.2	78.2	104.2	92.7	0.44	75 75	125	20
4284001 PDSD	Sodium	10/25/2022 12:55:29		352 352	mg/L	100	430.2	70.2	432.1	80.1	0.44	75 75	125	20
4311001 PDS	Sodium	10/25/2022 12:30:29	81.3	2560	mg/L	1000	3370	81.3	432.1	80.1	0.44	75 75	125	20
4311001 PDSD	Sodium	10/25/2022 13:11:00		2560	mg/L	1000	3370	01.3	3360	80.3	0.30	75 75	125	20
4448001 DUP	Sodium	10/25/2022 13:11:00	340.0	336	mg/L				3300	60.5	1.18	75	125	
4458008 DUP	Sodium	10/25/2022 13:13:23	340.0 1143	1120	mg/L						2.03			20 20
4458009 PDS	Sodium	10/25/2022 13:24:00		1070	mg/L	500	1491	85			2.03	75	125	20
					mg/L	500	1491	65	1402	9E 2	0.07			20
4458009 PDSD 4458014 DUP	Sodium Sodium	10/25/2022 13:25:00 10/25/2022 13:32:17	86.31	1070	mg/L				1492	85.2	0.07	75	125	20 20
4458021 PDS	Sodium	10/25/2022 13:32:17	84.6	83.3	mg/L	100	270.2	84.6			3.55	75	105	20
				295	mg/L	100	379.3	04.0	270.4	92.4	0.22	75 75	125	20
4458021 PDSD	Sodium	10/25/2022 13:41:32		295	mg/L				378.1	83.4	0.32	75	125	20
4467002 DUP	Sodium	10/25/2022 13:48:43		582	mg/L						3.96			20
4470001 DUP	Sodium	10/25/2022 13:51:59		79.1	mg/L	400	272.7	00			1.44	75	405	20
4470002 PDS	Sodium	10/25/2022 13:53:32		188	mg/L	100	273.7	86	074.0	07.4	0.40	75 75	125	00
4470002 PDSD	Sodium	10/25/2022 13:54:25		188	mg/L	400	404.0	77.0	274.8	87.1	0.40	75 75	125	20
4477001 PDS	Sodium	10/25/2022 13:58:22	77.9 75.0	387	mg/L	100	464.6	77.9	400.0	75.0	0.42	75 75	125	20
4477001 PDSD	Sodium	10/25/2022 13:59:23	75.9	387	mg/L				462.6	75.9	0.43	75	125	20
4506006 DUP	Sodium	10/25/2022 14:06:43		128	mg/L	400	404.0	405			1.42	0.5	445	20
LFB-MI	Sodium	10/25/2022 13:08:42			mg/L	100	104.9	105				85	115	
LFB-MI	Sodium	10/25/2022 13:36:29			mg/L	100	105.5	106				85	115	
MB	Sodium	10/25/2022 13:35:37			mg/L									
MB	Sodium Specific Conductores	10/25/2022 13:07:50		0554	mg/L									
4458015 DUP	Specific Conductance	10/20/2022 16:08:46	0.0000	9554	umhos/cm						40.05			20
4458020 DUP	Specific Conductance	10/21/2022 09:20:00	1.1080	1	umhos/cm						10.25			20
4483001 DUP	Specific Conductance	10/20/2022 13:21:54	589.00	590	umhos/cm						0.17			20
4519002 DUP	Specific Conductance	10/20/2022 18:51:08	1932.0	1935	umhos/cm						0.16			20
4519005 DUP	Specific Conductance	10/20/2022 22:56:11	1765.0	1767	umhos/cm						0.11			20
4553001 DUP	Specific Conductance	10/21/2022 02:27:32		1394	umhos/cm		4 400	40.			0.14	2=	105	20
CRM-C	Specific Conductance	10/21/2022 01:36:18			umhos/cm	1409	1429	101				95	105	
CRM-C	Specific Conductance	10/20/2022 21:07:40			umhos/cm	1409	1424	101				95	105	
CRM-C	Specific Conductance	10/21/2022 09:20:00	100		umhos/cm	1409	1408	100				95	105	

CRM-C	Specific Conductance	10/21/2022 09:20:00	100		umhos/cm	1409	1412	100				95	105	
CRM-C	Specific Conductance	10/20/2022 15:48:07	101		umhos/cm	1409	1420	101				95	105	
CRM-C	Specific Conductance	10/21/2022 05:46:48	102		umhos/cm	1409	1431	102				95	105	
CRM-C	Specific Conductance	10/20/2022 11:22:17	100		umhos/cm	1409	1409	100				95	105	
4458002 MS	Sulfate	10/26/2022 09:08:52	92.9	5640	mg/L	5000	10300	92.9				85	115	
4458002 MSD	Sulfate	10/26/2022 09:09:57	93.1	5640	mg/L				10300	93.1	0.00	85	115	20
4458008 MS	Sulfate	10/26/2022 09:35:21	85.7	5660	mg/L	5000	9950	85.7				85	115	-
4458008 MSD	Sulfate	10/26/2022 09:36:26	85.1	5660	mg/L				9920	85.1	0.30	85	115	20
4458019 MS	Sulfate	10/26/2022 09:50:49	96.8	<5	mg/L	100	96.8	96.8				85	115	
4458019 MSD	Sulfate	10/26/2022 09:51:55	98.8	<5	mg/L				98.8	98.8	2.04	85	115	20
4483001 MS	Sulfate		97.6	24.0	mg/L	100	122	97.6				85	115	
4483001 MSD	Sulfate		94	24.0	mg/L				118	94	3.33	85	115	20
4519001 MS	Sulfate	10/26/2022 10:28:21	94.5	203	mg/L	500	675	94.5				85	115	
4519001 MSD	Sulfate	10/26/2022 10:29:27	99.1	203	mg/L				698	99.1	3.35	85	115	20
4519006 MS	Sulfate	10/26/2022 10:54:52	92.1	576	mg/L	500	1040	92.1				85	115	
4519006 MSD	Sulfate	10/26/2022 10:55:58	90.9	576	mg/L				1030	90.9	0.97	85	115	20
4594001 MS	Sulfate	10/26/2022 11:13:39	97.4	62.9	mg/L	200	258	97.4				85	115	
4594001 MSD	Sulfate	10/26/2022 11:14:43	107	62.9	mg/L				276	107	6.74	85	115	20
4594005 MS	Sulfate	10/26/2022 11:32:26	85.4	195	mg/L	200	366	85.4				85	115	
4594005 MSD	Sulfate	10/26/2022 11:31:21	88.2	195	mg/L				372	88.2	1.63	85	115	20
LFB	Sulfate	10/26/2022 09:54:07	99.7		mg/L	100	99.7	99.7				85	115	
LFB	Sulfate	10/26/2022 09:13:16	98.9		mg/L	100	98.9	98.9				85	115	
LFB	Sulfate	10/26/2022 09:30:56	96.1		mg/L	100	96.1	96.1				85	115	
LFB	Sulfate	10/26/2022 08:54:30	102		mg/L	100	102	102				85	115	
LFB	Sulfate	10/26/2022 11:34:39	93.4		mg/L	100	93.4	93.4				85	115	
LFB	Sulfate	10/26/2022 11:20:16	90.7		mg/L	100	90.7	90.7				85	115	
LFB	Sulfate	10/26/2022 11:01:29	98.8		mg/L	100	98.8	98.8				85	115	
LFB	Sulfate	10/26/2022 10:34:57	99.4		mg/L	100	99.4	99.4				85	115	
LFB	Sulfate	10/26/2022 10:11:47	98		mg/L	100	98	98				85	115	
MB	Sulfate	10/26/2022 08:53:23	<5		mg/L									
MB	Sulfate	10/26/2022 11:40:10	<5		mg/L									
MB	Sulfate	10/26/2022 11:19:10	<5		mg/L									
MB	Sulfate	10/26/2022 09:29:49	<5		mg/L									
MB	Sulfate	10/26/2022 10:26:09	<5		mg/L									
MB	Sulfate	10/26/2022 09:12:10	<5		mg/L									
MB	Sulfate	10/26/2022 10:47:08	<5		mg/L									
MB	Sulfate	10/26/2022 09:53:01	<5		mg/L									
MB	Sulfate	10/26/2022 10:57:04	<5		mg/L									
4458015 DUP	рН	10/20/2022 16:08:46	7.66	7.6	units						0.79			20
4483001 DUP	рН	10/20/2022 13:21:54	7.31	7.8	units						6.48			20
4519002 DUP	рН	10/20/2022 18:51:08	7.26	7.3	units						0.55			20
4519005 DUP	рН	10/20/2022 22:56:11	7.33	7.4	units						0.95			20
4553001 DUP	рН	10/21/2022 02:27:32	8.65	8.8	units						1.72			20
CRM-PH	pН	10/21/2022 05:41:30	98.33		units	6	5.9	98.33				98.33	101.67	
CRM-PH	рН	10/20/2022 16:55:16	99		units	6	5.9	99				98.33	101.67	
CRM-PH	рН	10/20/2022 15:42:54	99		units	6	5.9	99				98.33	101.67	
CRM-PH	рН	10/21/2022 01:31:04	98.67		units	6	5.9	98.67				98.33	101.67	
CRM-PH	рН	10/20/2022 10:27:41	99.67		units	6	6	99.67				98.33	101.67	
CRM-PH	рН	10/20/2022 21:02:26	98.5		units	6	5.9	98.5				98.33	101.67	



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder: MDU Heskett Fall 2022 (4523) **PO:** 190708 OP

Todd Peterson Montana-Dakota Utilities 400 N 4th St Bismarck, ND 58501

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:



Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016 SD SDWA

Subcontracted Analyses

Analyzed By	Company	Address	Phone	Certification
SUBu	GEL Laboratories	2040, Charleston. SC 29407	843-556-8171	CERT

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

Report Date: Tuesday, November 29, 2022 2:53:40 PM



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Workorder Summary

Workorder Comments

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

Sample Comments

4523003 (Dup1) - Sample

Time sampled was not supplied by the client.

4523004 (Field Blank (FB)) - Sample

Time sampled was not supplied by the client.



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4523001
 Date Collected:
 10/17/2022 12:30
 Matrix:
 Groundwater

 Sample ID:
 MW13
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 1.0

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		_
Radium 228	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4523002
 Date Collected:
 10/17/2022 15:43
 Matrix:
 Groundwater

 Sample ID:
 MW80R
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 1.0

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		_
Radium 228	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

 Lab ID:
 4523003
 Date Collected:
 10/17/2022
 Matrix:
 Groundwater

 Sample ID:
 Dup1
 Date Received:
 10/19/2022 08:20
 Collector:
 MVTL Field Service

Temp @ Receipt (C): 1.0

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		
Radium 228	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Analytical Results

Lab ID:4523004Date Collected:10/17/2022Matrix:GroundwaterSample ID:Field Blank (FB)Date Received:10/19/2022 08:20Collector:MVTL Field Service

Temp @ Receipt (C): 1.0 Received on Ice: No

Contract Lab

Method: Contracted Result

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Radium 226	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		
Radium 228	See Attached			1	11/29/2022 09:02	11/29/2022 09:02	SUBu		



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



a member of The GEL Group INC



mod. Fou

November 22, 2022

Claudette Carroll

2616 E Broadway Ave Bismarck, North Dakota 58501

Re: Routine Analysis - Radiochemistry Work Order: 598417 SDG: 4523

Dear Claudette Carroll:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 27, 2022. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1614.

Sincerely,

Jordan Melton for Delaney Stone Project Manager

Purchase Order: BL6613 Enclosures



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

Report Date: Tuesday, November 29, 2022 2:53:40 PM

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Account #: 2800

Client: Montana-Dakota Utilities - Bismarck

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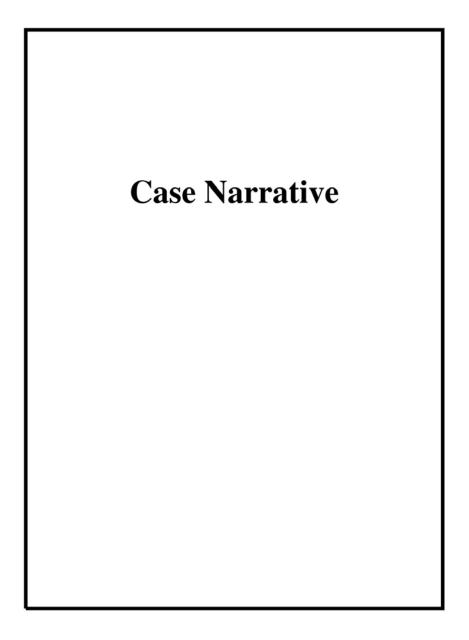
Case Narrative	1
Chain of Custody and Supporting Documentation	3
Laboratory Certifications	6
Radiological Analysis	8
Case Narrative	9
Sample Data Summary	13
Quality Control Summary	18



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Receipt Narrative for Minnesota Valley Testing Laboratories, Inc. SDG: 4523 Work Order: 598417

November 22, 2022

Laboratory Identification:

GEL Laboratories LLC 2040 Savage Road Charleston, South Carolina 29407 (843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on October 27, 2022 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
598417001	MW13
598417002	MW80R
598417003	Dup 1
598417004	Field Blank

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

Jordan Melton for Delaney Stone Project Manager

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WVI

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Chain of Custody and Supporting Documentation

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Tuesday, November 29, 2022 2:53:40 PM

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

LABORATORIES, Inc.
2616 E Broadway Ave

Chain of Custody Record
Page 1 of 1.

Toll Free:	Phone: (701)	rck, ND 585 258-9720 Fax: (701) 2										WO #4523	3	
Company Nar	Phone: (701) (800) 279-6885 me and Address:	rax. (701) 2	30-3724		Account #:							Phone #:	701-258-9720	
	2616 E	NVTL Broadway			Contact:	Claud	ette					Fax #:	report check bo	x
illing Addres	Bismarc ss (indicate if differen		Name of S	ampler:					E-mail:	ccarroll@m report check bo				
	DO I		Quote Nun	nber					Date Submitted:					
	PO I New Uln		Project Name/Number:							20-Oct-22 Purchase Order #:				
									BL6613					
					Bottle Type				е	Analysis				
IML Lab Number			Sample ID	Sample Type	Date Sampled	Time Sampled	Untreated	1000 ml HNO3	VOC Vials Umpreserved	Glass Jar	of the desired of the		nalysis Requ	ired
	4523001	M	W13	GW	17-Oct-22	1230		4					Ra226 & Ra2	28
	4523002	MV	V80R	GW	17-Oct-22	1543		4				Ra226 & Ra228		
	4523003	D	up 1	GW	17-Oct-22		Ш	4					Ra226 & Ra2	28
4523004		Field	i Blank	GW	18-Oct-22	3		4					Ra226 & Ra2	28
		AII	raculte mi	ist he re	eported a	s a nun	ner	ica	al va	alue				
		All	results int	or be re	1									
Tran	nsferred by:	Date:	Time:		Condition:		eceiv	/ed	by:			Date:		Temp:

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Client:

Montana-Dakota Utilities - Bismarck

MINNESOTA VALLEY TESTING LABORATORIES, INC.





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL Laboratories LLC				SAMPLE RECEIPT & REVIEW FORM						
Client: WT			SD	G/AR/COC/Work Order: 598417						
Received By: Thyasia Tatum				te Received:						
Carrier and Tracking Number				FedEx Express FedEx Ground UPS Field Services Courier Other 12 555 901 03 6965 4360						
Suspected Hazard Information	Yes	°		25559010319834180						
Anapetee Manara Estationality	*	z	-	Net Counts > 100cpm on samples not marked "radioactive", contact the Radistion Safety Group for further investigation.						
A)Shipped as a DOT Hazardons?	L	V	Ha	and Class Shipped: If UN2910, Is the Radioactive Shipment Survey Compliant? Yes No						
B) Did the client designate the samples are to be received as radioactive?	L	v	Co	C notation or radioactive stickers on containers equal client designation.						
C) Did the RSO classify the samples as radioactive?		~	Ma	Kimum Net Counts Observed* (Observed Counts - Area Background Counts):						
D) Did the client designate samples are hazardous?		1	-	C notation or hazard labels on containers equal client designation.						
E) Did the RSO identify possible hazards?		v	MUE	or B is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestox Beryllium Other:						
Sample Receipt Criteria	Yes	ž	ž	Comments/Qualifiers (Required for Non-Conforming Items)						
Shipping containers received intact and scaled?	V			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)						
2 Chain of custody documents included with shipment?	V			Circle Applicable: Client contacted and provided COC COC cremed upon receipt						
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		v	1	Preservation Method: Wet Ice Toe Packs Dry id None Other: *all temperatures are recorded in Celsius TEMP: 10 C						
4 Daily check performed and passed on IR temperature gun?	~			Temperature Device Serial #: IR2-20 Secondary Temperature Device Serial # (If Applicable):						
5 Sample containers intact and sealed?	1			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)						
6 Samples requiring chemical preservation at proper pH?	V			Sample ID's and Containers Affected: If Perservation added, Lott:						
7 Do any samples require Volatile Analysis?			·	If Yes, and Eucones or Soil Kits present for solids? Yes No NA (If yes, take to VOA Freezer) Dyflogid VOA vials contain acid preservation? Yes No NA (If unknown, solect No) Are liquid VOA vials free of headspore? Yes No NA Sample ID's and containers affected:						
8 Samples received within holding time?	1		Г	ID's and tests affected:						
9 Sample ID's on COC match ID's on bottles?	V		Г	ID's and containers affected:						
Date & time on COC match date & time on bottles?	V	-		Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)						
Number of containers received match number indicated on COC?	V			Circle Applicable: No container count on COC Other (describe)						
Are sample containers identifiable as GEL provided by use of GEL labels? COC form is properly signed in			V	Citcle Applicable: Not relinquished Other (describe)						
** relinquished/received sections? Comments (Use Continuation Form if needed):										
1255590103	A) rev	10	Q.	4970 Date 10/28/22 Page 1 of 1						
				rage of						

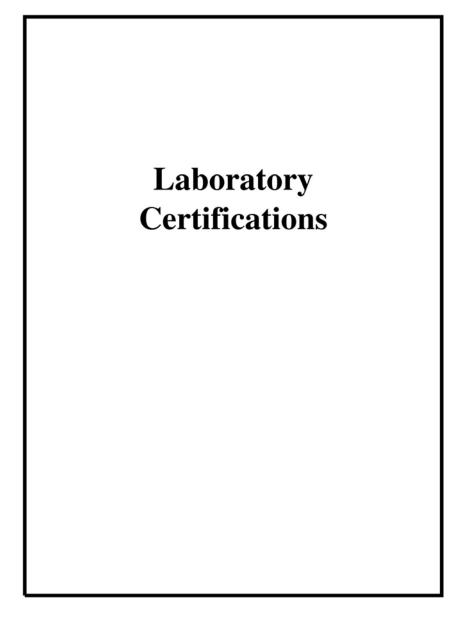
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MVT

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

List of current GEL Certifications as of 22 November 2022

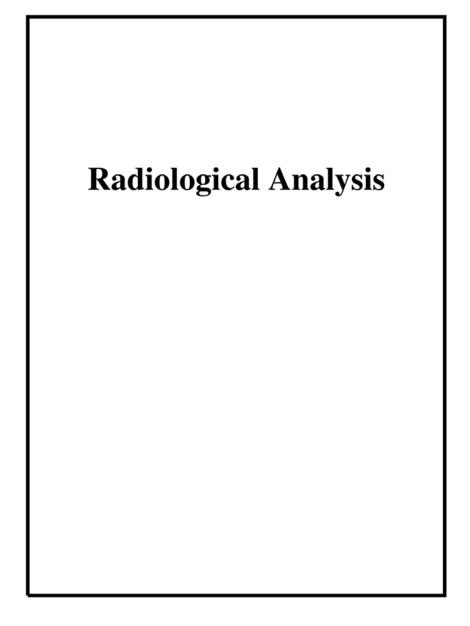
State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-3
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



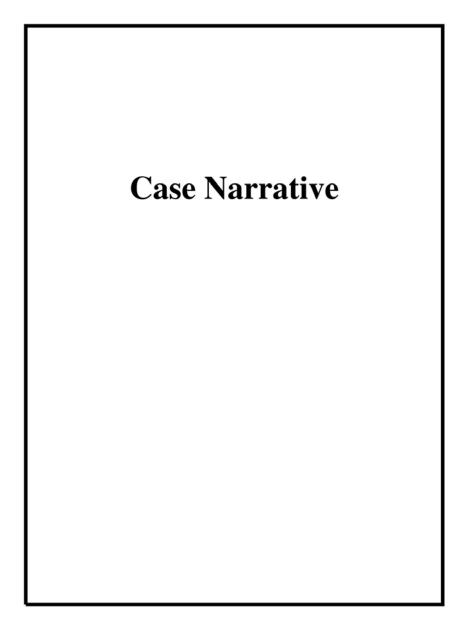
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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Radiochemistry
Technical Case Narrative
Minnesota Valley Testing Laboratories, Inc.
SDG #: 4523
Work Order #: 598417

Product: GFPC Ra228, Liquid

Analytical Method: EPA 904.0/SW846 9320 Modified Analytical Procedure: GL-RAD-A-063 REV# 5

Analytical Batch: 2336359

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
598417001	MW13
598417002	MW80R
598417003	Dup 1
598417004	Field Blank
1205232602	Method Blank (MB)
1205232603	598417001(MW13) Sample Duplicate (DUP)
1205232604	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

<u>Product:</u> Lucas Cell, Ra226, Liquid <u>Analytical Method:</u> EPA 903.1 Modified <u>Analytical Procedure:</u> GL-RAD-A-008 REV# 15

Analytical Batch: 2336349

CFI Sample ID#

The following samples were analyzed using the above methods and analytical procedure(s).

Client Sample Identification

GEL Sample 1D#	Cheft Sample Identification
598417001	MW13
598417002	MW80R
598417003	Dup 1
598417004	Field Blank
1205232576	Method Blank (MB)
1205232577	598417001(MW13) Sample Duplicate (DUP)
1205232578	598417001(MW13) Matrix Spike (MS)
1205232579	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Miscellaneous Information

Additional Comments

The matrix spike, 1205232578 (MW13MS), aliquot was reduced to conserve sample volume.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

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Qualifier Definition Report for

MVTL001 Minnesota Valley Testing Laboratories, Inc. Client SDG: 4523 GEL Work Order: 598417

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Name: Theresa Austin

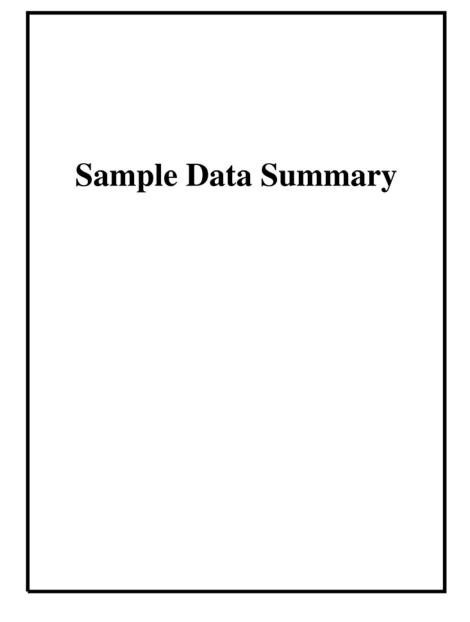
Date: 28 NOV 2022 Title: Group Leader

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: November 28, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: MW13 Sample ID: 598417001

Matrix: Ground Water
Collect Date: 17-OCT-22 12:30
Receive Date: 27-OCT-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Metho
Rad Gas Flow Prop	ortional Counting	z.									
GFPC Ra228, Liqui	id "As Received"										
Radium-228	U	0.367	+/-0.899	1.63	3.00	pCi/L		CT2	11/22/22	1033 2336359	1
Rad Radium-226											
Lucas Cell, Ra226,	Liquid "As Rece	ived"									
Radium-226	•	0.332	+/-0.226	0.254	1.00	pCi/L		LXP1	11/28/22	0834 2336349	2
The following Ana	lytical Methods v	vere perfe	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 M	odified									
Surrogate/Tracer Re	ecovery Test				R	esult	Nominal	Reco	very%	Acceptable L	imits
Barium-133 Tracer	GEPC I	a228 Lian	id "As Received"						74.4	(15%-125%))

Notes

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 28, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

 Client Sample ID:
 MW80R
 Project:

 Sample ID:
 598417002
 Client ID:

Matrix: Ground Water
Collect Date: 17-OCT-22 15:43
Receive Date: 27-OCT-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting	;									
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	0.278	+/-1.14	2.07	3.00	pCi/L		CT2	11/22/22	1033 2336359	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226		0.684	+/-0.326	0.382	1.00	pCi/L		LXP1	11/28/22	0834 2336349	2
The following Anal	ytical Methods w	vere perfo	rmed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Me	odified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable Li	imits
Barium-133 Tracer	GFPC R	a228. Liqui	id "As Received"						81.6	(15%-125%)	

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

Project:

Client ID:

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Certificate of Analysis

Report Date: November 28, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: Dup 1 Sample ID: 598417003

Matrix: Ground Water
Collect Date: 17-OCT-22 12:00
Receive Date: 27-OCT-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propor	rtional Counting	;									
GFPC Ra228, Liquid	"As Received"										
Radium-228	U	1.14	+/-1.34	2.27	3.00	pCi/L		CT2	11/22/22	1033 2336359	1
Rad Radium-226											
Lucas Cell, Ra226, L	iquid "As Recei	ved"									
Radium-226		3.44	+/-0.656	0.374	1.00	pCi/L		LXP1	11/28/22	0834 2336349	2
The following Analy	tical Methods v	vere perfo	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 N	Modified								
2	EPA 903.1 Me	odified									
Surrogate/Tracer Rec	overy Test				R	esult	Nominal	Reco	very%	Acceptable Li	imits
Barium-133 Tracer	GFPC F	a228, Liqui	id "As Received"						82.5	(15%-125%)	

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 28, 2022

MVTL00121

MVTL001

Company:

Address: 2616 E Broadway Ave

Bismarck, North Dakota 58501

Contact: Claudette Carroll

Project: Routine Analysis - Radiochemistry

Client Sample ID: Field Blank Project: Sample ID: 598417004 Client ID:

Matrix: Ground Water
Collect Date: 18-OCT-22 15:00
Receive Date: 27-OCT-22
Collector: Client

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF D	F Analy	st Date	Time Batch	Method
Rad Gas Flow Propo	ortional Counting	;									
GFPC Ra228, Liquio	d "As Received"										
Radium-228	U	0.114	+/-1.08	2.01	3.00	pCi/L		CT2	11/22/22	1033 2336359	1
Rad Radium-226											
Lucas Cell, Ra226, I	Liquid "As Recei	ved"									
Radium-226	U	0.298	+/-0.283	0.443	1.00	pCi/L		LXP1	11/28/22	0834 2336349	2
The following Anal	ytical Methods v	vere perfo	ormed:								
Method	Description						Analyst C	omment	s		
1	EPA 904.0/SV	V846 9320 I	Modified								
2	EPA 903.1 Me	odified									
Surrogate/Tracer Re	covery Test				R	esult	Nominal	Reco	very%	Acceptable L	mits
Barium-133 Tracer	GFPC F	a228. Liqu	id "As Received"						79.9	(15%-125%)	

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

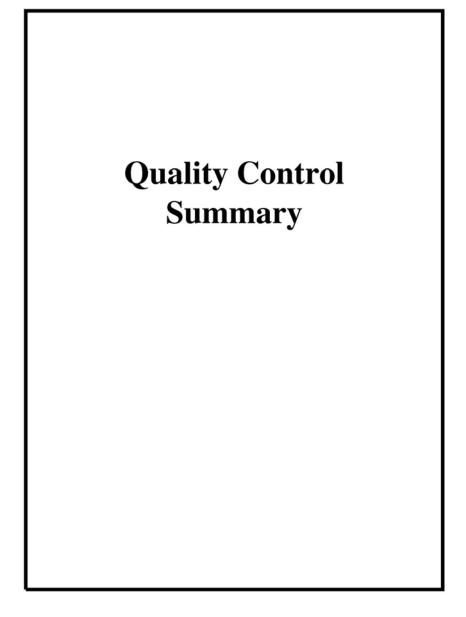
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MVT

MINNESOTA VALLEY TESTING LABORATORIES, INC.



Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

GEL LABORATORIES LLC

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QC Summary

Report Date: November 28, 2022

Page 1 of 2

2616 E Broadway Ave Bismarck, North Dakota Contact: Claudette Carroll

Workorder: 598417

Parmname			NOM	Sample	Qual	QC	Units	RPD%	REC%	Range Anlst	Date Time
Rad Gas Flow Batch 233	6359										
QC1205232603	598417001	DUP									
Radium-228			U	0.367	U	1.03	pCi/L	N/A		N/A CT2	11/22/22 10:32
			Uncertainty	+/-0.899		+/-1.31					
QC1205232604	LCS										
Radium-228			65.4			60.2	pCi/L		92	(75%-125%)	11/22/22 10:33
			Uncertainty			+/-4.84					
QC1205232602	MB										
Radium-228					U	0.641	pCi/L				11/22/22 10:32
			Uncertainty			+/-1.21					
Rad Ra-226 Batch 233	6349										
	598417001	DUD									
Radium-226	398417001	DUP		0.332		0.387	pCi/L	15.2		(0% - 100%) LXP1	11/28/22 08:34
Radiani-220			Uncertainty	+/-0.226		+/-0.254	PCDL	13.2		(0% - 100%) EXT	11/20/22 00:54
			Checitanity	17 01220		17 0120 1					
QC1205232579	LCS										
Radium-226			26.5			21.3	pCi/L		80.2	(75%-125%)	11/28/22 08:34
			Uncertainty			+/-1.51					
QC1205232576	MB										
Radium-226					U	0.354	pCi/L				11/28/22 08:34
			Uncertainty			+/-0.306					
QC1205232578	598417001	MS									
Radium-226			130	0.332		101	pCi/L		77.3	(75%-125%)	11/28/22 08:34
			Uncertainty	+/-0.226		+/-7.92					

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded

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

Report Date: Tuesday, November 29, 2022 2:53:40 PM



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Client: Montana-Dakota Utilities - Bismarck Account #: 2800

GEL LABORATORIES LLC

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OC Summary

			-	VC D	*********	.,						
Workor	rder: 598417										Pag	e 2 of 2
Parmna	me	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J	See case narrative for an ex	planation										
J	Value is estimated											
K	Analyte present. Reported v	alue may be biased	high. Actual	value is e	xpected to	be lower.						
L	Analyte present. Reported v	alue may be biased	low. Actual	value is ex	spected to b	e higher.						
M	M if above MDC and less th	nan LLD										
M	REMP Result > MDC/CL a	nd < RDL										
N/A	RPD or %Recovery limits d	o not apply.										
N1	See case narrative											
ND	Analyte concentration is no	t detected above the	detection lin	nit								
NJ	Consult Case Narrative, Da	ta Summary packag	e, or Project	Manager o	concerning	this qualifi	ier					
Q	One or more quality control	criteria have not be	een met. Refe	r to the ap	plicable na	rrative or I	DER.					
R	Sample results are rejected											
U	Analyte was analyzed for, b	ut not detected abo	ve the MDL,	MDA, MI	DC or LOD							
UI	Gamma SpectroscopyUnc	ertain identification	i									
UJ	Gamma SpectroscopyUnc	ertain identification	E.									
UL	Not considered detected. The	ne associated number	er is the repor	ted concer	ntration, wh	ich may be	e inaccurate	due to a low	bias.			
X	Consult Case Narrative, Da	ta Summary packag	e, or Project	Manager o	concerning	this qualifi	ier					
Y	Other specific qualifiers we	re required to prope	erly define the	e results. C	Consult case	narrative.						
٨	RPD of sample and duplicate	te evaluated using +	-/-RL. Conce	entrations a	are <5X the	RL. Qual	lifier Not Ap	plicable for	Radiochem	istry.		

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where the duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

Preparation or preservation holding time was exceeded

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MV	2616 E. Br	ota Valley To oadway Ave ND 58501 0720							0: 4523		CI	hain of Custody Record
Report To: Attn: Address: Phone: Email:	MDU Todd Peterson 400 N. 4th St Bismarck, ND 58501 701-425-2427 Todd.Peterson@mdu.cc	om		CC:						Project Name: Event: Sampled By:	Jen	MDU Heskett Fall 2022
	Sami	ole Information	n			Samp	le Contair	ers		Field Readin	igs .	
Lab Number	Sample ID	Date	Time	Sample Type	1 Liter Nitric							Analysis Required
001	MW13	170ct22	1230	GW	4			13			-17-	
-	MW1-90	180, +22	1205	GW -	4 1	-	\vdash	1	Dry		_	
	MW2-90	180et22	1202	GW	4 X	-			Day			
002	MW3-90 MW80R	182,022	1543	GW	4 4	-	H	-	Dry		-	Rad 226 & 228
003	Dup 1	170,+22 170,+22	NA	GW	4	H	++	-			_	- 1000000000000000000000000000000000000
004	Field Blank (FB)	180ct22	NA	GW	4							-
Comments:	# 180et22 1										17	
											Long	@a1986722
	Relinquished By Name	Date/Time	Loca		le Cond	Temp	(°C)			Name	ceived By	Date/Time
	1	190012	Walk	TIP	TA	1.0	TM805		C	Canto		28 OCT22 6820

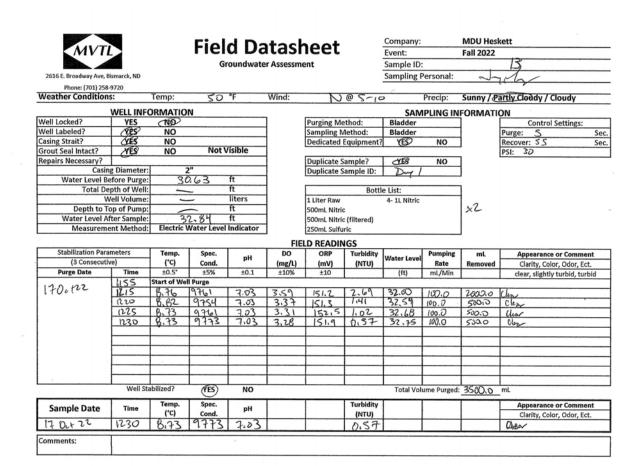


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck



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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTL	•		Fiel	d Da	atasl	neet		Company: Event:		MDU Hes	kett
////	4				er Assessm			Sample ID:		rdii 2022	1-90,
2616 E. Broadway Ave, Bi	sparek ND		01	ounawati	ei Assessiii	ciic		Sampling F			10
								Sampling r	ersonat.		77 Ply
Phone: (701) 258-9 Weather Conditions		Temp:		°F	Wind:		8		D	C / D	
weather Conditions	•	remp:		Г	wina:		@		Precip:	Sunny / P	artly Cloudy / Cloudy
		ORMATIO	N		_			SAM	IPLING IN	FORMATI	ON
Well Locked?	YES	NO				Purging Me		Bladder]	Control Settings:
Well Labeled?	YES	NO				Sampling N	/lethod:	Bladder			Purge: Se
Casing Strait?	YES	NO				Dedicated	Equipment	(TES)	NO]	Recover: Se
Grout Seal Intact?	YES	NO	Not \	/isible							PSI:
Repairs Necessary?]	Duplicate S	Sample?	YES	(NO	1	
	g Diameter:		2"			Duplicate S	Sample ID:		-]	
Water Level Be		Below	Ping	ft]						
	oth of Well:	_	- 1	ft			Bott	le List:			
	ell Volume:	_		liters		1 Liter Raw		4- 1L Nítric		1	
Depth to To		14.48	8	ft]	500mL Nitri	~			1	
Water Level Af				ft		500mL Nitrie	c (filtered)				
Measureme	nt Method:	Electric V	Nater Level	Indicator		250mL Sulfu	ıric				
					FIE	LD READIN	ics				
Stabilization Parar	neters	Temp.	Spec.		DO	ORP	Turbidity		Pumping	mL	Appearance or Comment
(3 Consecutiv		(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10	(1110)	(ft)	mL/Min	Kemoved	clear, slightly turbid, turbid
		Start of Wel	l Purge					(-4			clear, siightly turbia, turbia
						T		T		T	
						1				1	
										1	
	Well Sta	abilized?	YES	NO		-		Total Vol	ume Purged:		mL
Sample Date	Time	Temp.	Spec.	pH	T	T	Turbidity				Appearance or Comment
Janiple Date	Tille	(°C)	Cond.	pn			(NTU)				Clarity, Color, Odor, Ect.
18 Oct 22	1205										
Comments:	insid	Ficient	volum	1	So 60	م مله					

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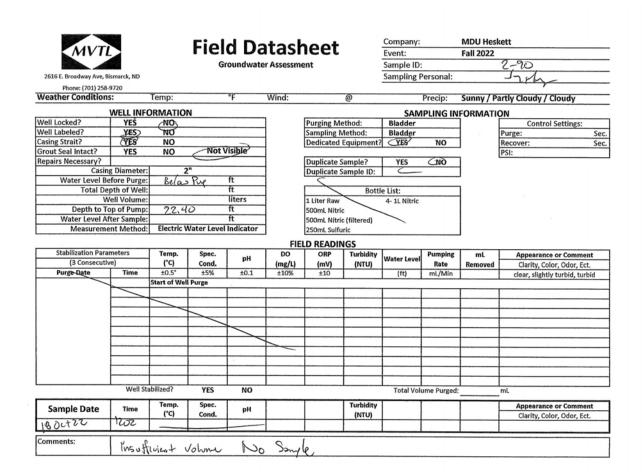


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Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

MVTI			riei	a Da	atasł	ieet		Event:		Fall 2022	
	4		Gr	oundwate	er Assessm	ent		Sample ID:			3-90
2616 E. Broadway Ave, E	ismarck, ND							Sampling F	ersonal:		Jack
Phone: (701) 258	-9720										
eather Condition	s:	Temp:		°F	Wind:	@)		Precip:	Sunny / P	artly Cloudy / Cloudy
	WELL INFO	RMATIO	N					SAM	PLING IN	FORMATI	ON
/ell Locked?	YES	ONO			7	Purging Meth	od:	Bladder		1	Control Settings:
/ell Labeled?	4ES	NO			1	Sampling Met		Bladder		1	Purges
asing Strait?	YES	NO			1	Dedicated Equ		(YES)	NO	1	Recover:
rout Seal Intact?	YES	NO	NotV	isible>						•	PSI:
epairs Necessary?						Duplicate San	nple?	YES	410]	
	g Diameter:	2]	Duplicate San	nple ID:	C-	-]	
Water Level B		Below	Pung	ft							
	pth of Well:		,	ft			Bott	le List:			
	/ell Volume:			liters	1	1 Liter Raw		4- 1L Nitric			
	op of Pump:	20'5		ft	1	500mL Nitric					
Water Level A		FI		ft	4	500mL Nitric (f	iltered)				
Measurem	ent Method:	Electric V	Vater Level	Indicator	J	250mL Sulfuric				j	
					FIE	LD READING	S				
Stabilization Para		Temp.	Spec.	pH	DO	ORP 1	Turbidity	Water Level	Pumping	mL	Appearance or Comment
(3 Consecuti		(°C)	Cond.		(mg/L)	(mV)	(NTU)	water tevel	Rate	Removed	Clarity, Color, Odor, Ect.
Purge Date	Time	±0.5*	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid, turbid
		Start of Wel	Purge								
								-			
						+		-			
		_			-	+		-			
								-			
	-							-			
	-										
	-					+		-			
	Well Sta	bilized?	YES	NO				Total Vol	ume Purged:		mL .
				110				TOTAL VOI	unie ruigeu.		- 1112
Sample Date	Time	Temp.	Spec.	pН		1	Turbidity				Appearance or Comment
Boiter	1158	(°C)	Cond.		+	 	(NTU)	-			Clarity, Color, Odor, Ect.
BULTUC	11120										
					-						
omments:	insuff!	1 1	1	1 0	Some						

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



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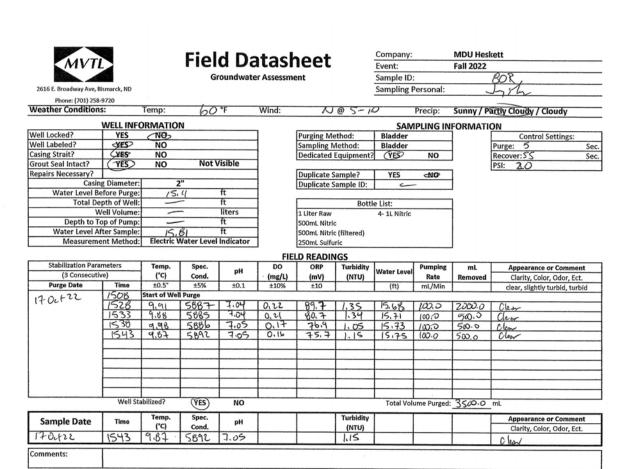
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Account #: 2800

Client:

Montana-Dakota Utilities - Bismarck



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Report Date: Tuesday, November 29, 2022 2:53:40 PM





Account #: 2800 Client: Montana-Dakota Utilities - Bismarck

1				
		M	V7	
ı	b			
•			-	

Field Datasheet

Surface water Assessment

Company: MDU Lewis & Clark
Event: Fall 2022

Sampling Personal:

Weather Conditions:	Temp:		°F	Wind:	@	Precip: Sunny / Partly Cloudy / Cloudy
Well ID	Date	Time	Casing Diameter	Water Level (ft)		Comments
MW70		1437	2"	22.50		
MW33		1456	2"	44.10		
MW101		1440	2"	38,50		
MW102	(70×22	1434	2"	19,28		
MW103	(400	1445	2"	35,6B		
MW44R		1450	2"	28,91		
MW104		1500	2"	15,54		
MW105		1503	2"	13,53		

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Laboratory Reports and Field Sheets: MW1-90

Appendix A MW1-90 Water Quality Analytical Data Summary 2017 - 2021

2022 Annual Monitoring Report Heskett CCR Groundwater Compliance

		Location	MW1-90	MW1-90	MW1-90	MW1-90	MW1-90	MW1-90	MW1-90	MW1-90	MW1-90
		Date	6/22/2017	10/05/2017	4/04/2018	10/04/2018	4/03/2019	9/18/2019	4/01/2020	9/14/2020	3/23/2021
	Sam	iple Type	N	N	N	N	N	N	N	N	N
	Da	ta Status	No QC	No QC	No QC	No QC	No QC	No QC	No QC	Validated	Validated
Parameter	Analysis Location	Units									
General Parameters											
Chloride	Lab	mg/l	84.4	87.8	90.6	86.2	81.2	76.6	75.4	89.9	82.7
Fluoride	Lab	mg/l	1.04	1.02	1.03	1.03	1.06	1.10	1.03	1.08	1.03
Solids, total dissolved	Lab	mg/l	9440	8900	9810	9490	9740	10300	11000	11200	12200
Sulfate, as SO4	Lab	mg/l	6610	5900	6900	6480	6730	7120	7720	7880	7030
pН	Field	pH units	6.8	6.9	6.88	6.74	6.64	6.87	6.83	6.80	6.89
Total Metals											
Antimony	Lab	mg/l									< 0.001 U
Arsenic	Lab	mg/l									< 0.002 U
Barium	Lab	mg/l									0.0082
Beryllium	Lab	mg/l									< 0.0005 U
Boron	Lab	mg/l									< 0.5 U
Cadmium	Lab	mg/l									< 0.0005 U
Calcium	Lab	mg/l	407	424	405	406	412	447	421	408	397
Chromium	Lab	mg/l									< 0.002 U
Cobalt	Lab	mg/l									< 0.002 U
Lead	Lab	mg/l									< 0.0005 U
Lithium	Lab	mg/l									0.690
Mercury	Lab	mg/l									< 0.0002 U
Molybdenum	Lab	mg/l									< 0.002 U
Selenium	Lab	mg/l									< 0.005 U
Thallium	Lab	ma/l									< 0.0005 U

-- Not analyzed/Not available.

N: Sample Type: Normal

U: The analyte was analyzed for, but was not detected.

ND: The result was less than the uncertainity and/or the minimum detectable concentration.

q: The combined radium result includes both detected and not detected values.

No QC: Laboratory data has been excluded from Barr QA/QC procedures.

Validated: Laboratory data has been evaluated following Barr QA/QC procedures and/or project-specific data review requirements. Field data has been verified for transcription errors, consistency and completeness.



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CASE NARRATIVE

MVTL Lab Reference No/SDG:

201782-1684

Client:

Montana Dakota Utilities

Location:

MDU Heskett

Project Identification:

NDDH June 2017

MVTL Laboratory Identifications:

17-W2506

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
1-90	17-W2506

I. RECEIPT

- All samples were received at the laboratory on 23 Jun17 at 823.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
 - Temperature of samples upon receipt was 1.7°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

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

III. METHODS

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

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
 - For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
 - One alkalinity matrix spike duplicate recovery was outside the acceptable limits. Recovery
 for the matrix spike was acceptable. RPD for the recoveries of the matrix spike duplicate and
 the matrix spike was within limits. No further action was taken.
 - Recovery for one lead 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 laborator	ry data has been approved by MVTL Laborato	ries.	
SIGNED:	Claudatte antl	DATE:	12JU17
Clau	idette Carroll - MVTL Bismarck Laboratory Ma	nager	

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Page: 1 of 2

Quality Control Report
Lab ID: 17-W2506

Lab ID: 17-W2506		Pr	oject: MI	DU Heske	ett	1	Work Or	der: 201	782-1684	4							
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
Arsenic - Dissolved mg/l	0.1000	100	80-120	0.100 0.100	17W2578q 17W2584q	< 0.002 0.0029	0.0965 0.1098	96 107	75-125 75-125	0.0965 0.1098	0.0991 0.1091	99 106	2.7 0.6	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40 0.40	100 100	80-120 80-120	5.00	17W2506q	< 0.5	5.25	105	75-125	5.25	5.40	108	2.8	20	-	-	< 0.1
Boron - Dissolved mg/l	0.40	105	80-120	0.300 0.600	17-W2477 17-W2506	< 0.1 0.26	0.26 0.88	87 103	75-125 75-125	0.26 0.88	0.26 0.86	87 100	0.0 2.3	20 20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	105	80-120	0.100 0.100	17W2578q 17W2584q	< 0.0005 < 0.0005		92 109	75-125 75-125	0.0924 0.1090	0.0952 0.1112	95 111	3.0 2.0	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	108	80-120	500 100	17W2504q 17W2518q	530 4.0	980 104	90 100	75-125 75-125	980 104	975 105	89 101	0.5 1.0	20 20	-	-	< 1 < 1
Chloride mg/l	30.0	88	80-120	60.0 600	17-W2661 17-M1596	5.3 222	58.8 758	89 89	80-120 80-120	58.8 758	56.8 803	86 97	3.5 5.8	20 20	-	-	< 1 < 1
Chromium - Dissolved mg/l	0.1000	98	80-120	0.100 0.100	17W2578q 17W2584q	< 0.002 < 0.002	0.0900 0.0960	90 96	75-125 75-125	0.0900 0.0960	0.0926 0.0966	93 97	2.8 0.6	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	-	_	-	-	-		-	-	9558	9558	-	0.0	20	_	-	-
Fluoride mg/l	0.50 0.50	106 106	90-110 90-110	0.500	17-W2503	0.27	0.70	86	80-120	0.70	0.70	86	0.0	20	-	-	< 0.1 < 0.1
Iron - Dissolved mg/l	0.40 0.40	105 102	80-120 80-120	5.00	17W2506q	< 0.5	5.25	105	75-125	5.25	5.35	107	1.9	20	-	-	< 0.1
Lead - Dissolved mg/l	0.1000	99	80-120	0.100 0.100	17W2578q 17W2584q	< 0.0005 < 0.0005	0.0738 0.1000	74 100	75-125 75-125	0.0738 0.1000	0.0792 0.0968	79 97	7.1 3.3	20 20	-	-	< 0.0005
Magnesium - Total mg/l	20.0	109	80-120	500 100	17W2504q 17W2518q	246 1.8	720 101	95 99	75-125 75-125	720 101	715 100	94 98	0.7	20 20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40 0.40	105 105	80-120 80-120	5.00	17W2506q	< 0.25	5.30	106	75-125	5.30	5.40	108	1.9	20	-	-	< 0.05
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	17-W2506	< 0.0002	0.0019	95	70-130	0.0019	0.0019	95	0.0	20		_	< 0.0002

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Page: 2 of 2

Quality Control Report

Lab ID: 17-W2506 Project: MDU Heskett Work Order: 201782-1684

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Molybdenum - Dissolved mg/l	0.40 0.40	102 102	80-120 80-120	5.00	17W2506q	< 0.5	5.45	109	75-125	5.45	5.60	112	2.7	20	Ĭ.	6.0	< 0.1
Nitrate-Nitrite as N mg/l	0.50	108	90-110	1.00	17-W2505	< 0.1	1.10	110	90-110	1.10	1.06	106	3.7	20	14	4	< 0.1
pH units	137.7	15/	· •	1) -		D+C.		185	7.4	7.4	2.	0.0	20	420	19	(G) = 1
Phosphorus as P - Total mg/l	0.50	102	90-110	1.00	17-W2506	< 0.1	0.98	98	90-110	0.98	1.03	103	5.0	20	-		< 0.1
Potassium - Total mg/l	10.0	91	80-120	100 20.0	17W2504q 17W2518q	12.8 2.7	107 23.7	94 105	75-125 75-125	107 23.7	106 23.6	93 104	0.9 0.4	20 20		100	< 1 < 1
Selenium - Dissolved mg/l	0.1000	108	80-120	0.100 0.100	17W2578q 17W2584q	< 0.005 0.0737	0.1173 0.1864	117 113	75-125 75-125	0.1173 0.1864	0.1233 0.1857	123 112	5.0 0.4	20 20	Š	15.	< 0.002
Silver - Dissolved mg/l	0.1000	102	80-120	0.100	17W2584q	< 0.0005	0.0938	94	75-125	0.0938	0.0962	96	2.5	20		7	< 0.000
Sodium - Total mg/l	20.0	100	80-120	500 500	17W2504q 17W2518q	585 625	1000 1070	83 89	75-125 75-125	1000 1070	1010 1050	85 85	1.0 1.9	20 20		9.20	< 1 < 1
Sulfate mg/l	100	110	80-120	100	17-W2505	< 5	99.4	99	80-120	99.4	99.1	99	0.3	20	9		< 5
Total Alkalinity mg/l CaCO3	410 410	97 97	90-110 90-110	410	17-W2504	506	832	80	80-120	832	825	78	0.8	20	92	80-120	< 20 < 20

Approved by: C: Cauro 12 TVL17



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CERTIFICATE of ANALYSIS - STATE

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

Project Name: MDU Heskett Sample Description: 1-90

Event and Year: June 2017

1 of 1 Page:

Report Date: 7 Jul 17 Lab Number: 17-W2506 Work Order #: 82-1684 Account #: 002800

Date Sampled: 22 Jun 17 16:27 Date Received: 23 Jun 17 8:23 Sampled By: MVTL Field Services

Temp at Receipt: 1.7C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	23 Jun 17	CS
Conductivity (EC)	9558	umhos/cm	1	SM2510-B	23 Jun 17 18:00	CS
pH - Field	6.78	units	NA	SM 4500 H+ B	22 Jun 17 16:27	JSM
DH	+ 7.4	units	0.1	SM4500 H+ B	23 Jun 17 18:00	CS
Temperature - Field	10.7	Degrees C	NA	SM 2550B	22 Jun 17 16:27	JSM
Total Alkalinity	315	mg/l CaCO3	20	SM2320-B	23 Jun 17 18:00	CS
Bicarbonate	315	mg/1 CaCO3	20	SM2320-B	23 Jun 17 18:00	CS
Carbonate	< 20	mg/l CaCO3	20	SM2320-B	23 Jun 17 18:00	CS
Hydroxide	< 20	mg/1 CaCO3	20	SM2320-B	23 Jun 17 18:00	CS
Conductivity - Field	9375	umhos/cm	1	EPA 120.1	22 Jun 17 16:27	JSM
Tot Dis Solids (Summation)	9440	mg/l	12.5	SM1030-F	7 Jul 17 9:23	Calculated
Total Hardness as CaCO3	4390	mg/1	NA	SM2340-B	30 Jun 17 11:04	Calculated
Cation Summation	145	meg/L	NA.	SM1030-F	30 Jun 17 11:04	Calculated
Anion Summation	147	meg/L	NA	SM1030-F	7 Jul 17 9:23	Calculated
Percent Error	-0.60	*	NA	SM1030-F	7 Jul 17 9:23	Calculated
Sodium Adsorption Ratio	8.53		NA	USDA 20b	30 Jun 17 11:04	Calculated
Fluoride	1.04	mg/1	0.10	SM4500-F-C	23 Jun 17 18:00	CS
Sulfate	6610	mg/l	5,00	ASTM D516-07	29 Jun 17 13:07	EMS
Chloride	84.4	mg/l	1.0	SM4500-C1-E	7 Jul 17 9:23	EMS
Nitrate-Nitrite as N	5.26	mg/l	0.10	EPA 353.2	30 Jun 17 13:14	EMS
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jun 17 10:41	EMS
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	29 Jun 17 13:15	EV
Calcium - Total	407	mg/1	1.0	6010	30 Jun 17 11:04	SZ
Magnesium - Total	820	mg/1	1.0	6010	30 Jun 17 11:04	SZ
Sodium - Total	1300	mg/l	1.0	6010	30 Jun 17 11:04	SZ
Potassium - Total	22.7	mg/l	1.0	6010	30 Jun 17 11:04	SZ
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010	27 Jun 17 15:34	SZ
Manganese - Dissolved	< 0.25 @	mg/l	0.05	6010	27 Jun 17 15:34	SZ
Boron - Dissolved	0.26	mg/1	0.10	6010	26 Jun 17 14:13	KMD
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020	5 Jul 17 16:20	KMD
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020	5 Jul 17 16:20	KMD
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020	5 Jul 17 16:20	KMD
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020	5 Jul 17 16:20	KMD
Selenium - Dissolved	0.0205	mg/1	0.0020	6020	5 Jul 17 16:20	KMD
Silver - Dissolved	< 0.0005	mg/1	0.0005	6020	6 Jul 17 9:14	KMD

* Holding time exceeded

Claudette Approved by: K Canteo 12JULI7

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



Field Datasheet

Groundwater Assessment

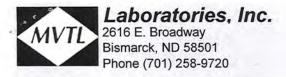
Company:	MDU Heskett
Event:	2017
Sample ID:	1-90,
Sampling Personal:	Jen the

	•					-						
Phone: (701) 258-9	720					-						
Neather Conditions:		Temp:	65 °F	Wind:	N @	10-15		Precip:	Sunt	ny / Rartly C	loudy / Clou	ıdy
	Well Info	rmation					Sa	mpling l	nformatio	on		
Well Locked?	Yes	No			Purgir	ng Method:	Blad	der		Co	ntrol Settings	s
Well Labeled?	Yes	No			Samplin	ng Method:	Blad	der		Purge:	5	sec.
Casing Straight?	Yes	No			Dedicate	ed Equip?:	Yes	No		Recover:	55	sec.
Grout Seal Intact?	Yes	No	Not Visible		Duplicate	Sample?:	Yes	(No		PSI:	i O	
Repairs Necessary:					Duplicate \$	Sample ID:				Pumping R	ate: 100	mL/min
	Diameter:		2"									
Water Level Bef	ore Purge:).	1,24 ft		Р	urge Date:	22 Jm	17		ing Began:	1607	am/p៣
	/ell Depth:				Well Pu	urged Dry?	Yes	No∑		urged Dry:		am/pm
We	ell Volume:	-	liters		Sa	mple Date:	22 Jun	17	Time of	f Sampling:	1627	am/pm
Depth to Tor	of Pump:		ft									
Water Level After	er Sample:		1,35 ft		Bottle		1L Raw, 50	0mL Nitirc,	500mL Nitr	ric (filtered),	4-1L Nitric	
Measuremen		Electric \	Water Level Indicator		List:			25	0 mL Sulfu	ric		
			Field	Measure	ements							

(3 cons	ization secutive)	Temp (°C)	Spec. Cond.	pH	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		±5%	±0.1	<u> </u>					
1	1612	11.29	9493	6.83	4.11	154.1	0,66	11,35	500,0	Clear
2	1617	10.25	9447	6.82	4.01	153,0	0.63	11,51	300,0	Clean
3	1622	10, 79	9417	6.83	3.90	149.7	0.39	11,40	500,0	Clean
4	1627	10,72	9375	6,78	3.85	148.3	0,45	11.39	500.0	Cha
5										
6										
7										
8										
9										
10										

Stabilized: No Comments:

Total Volume Removed: 2600 mL



Chain of Custody Record

Project Nam	e:	Event:	Work Order Number: 82-1684
	MDU Heskett	June 2017	02-1689
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s):

	Samp	ole Informatio	n			Bot	tle Type	F	eld Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	1 liter	500mL Nitric	250 mL Sulfuric	Temp (°C)	Spec. Cond	i Ha	Analysis Required
MOSCH	1-90	22 June 17	1627	GW	X	хх		10.72	9375	6.78	
											MDU List AA

Comments:

Relinquished By:		Sam	ple Condition:
Name:	Date/Time	Location:	Temp (°C)
10	23 Jun 17 0823	Log In Walk In #2	TM562/JM588
2			

Name:	Date/Time
(now Simonan	23 June 17 823
July Children	



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CASE NARRATIVE

MVTL Lab Reference No/SDG: 201782-2798

Client: Montana Dakota Utilities

Location: MDU Heskett

Project Identification: NDDH October 2017

MVTL Laboratory Identifications: 17-W4319

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
1-90	17-W4319

I. RECEIPT

- All samples were received at the laboratory on 6 Oct 2017 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
 - Temperature of samples upon receipt was 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 and Method 6020B were used to analyze the metals.

IV. ANALYSIS

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

All laboratory data has been approved by MVTL Laboratories.

SIGNED: DATE: / NVI7

Claudette Carroll - MVTL Bismarck Laboratory Manager

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Page: 1 of 2

Quality Control Report

Lab ID: 17-W4319	em Francisco, wenterda	<u>P</u> r	roject: MI	JU Heske	ett	1.	Nork Or	rder: 201	1782-2798	8							
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	
Arsenic - Dissolved mg/l	0.1000	105	80-120	0.100 0.100	17W4312q 17W4318q	< 0.002 < 0.002	0.1109 0.1059	i i	75-125 75-125	0.1109	0.1115	112	0.5 3.6	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	108	80-120	5.00	17W4319q	< 0.5	4.34	87	75-125	4.34	4.64	93	6.7	20	_	-	< 0.1
Boron - Dissolved mg/l	0.40	105	80-120	0.400	17-W4420	0.49	0.85	90	75-125	0.85	0.84	88	1.2	20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.1000	108	80-120	0.100 0.100	17W4312q 17W4318q	< 0.0005 < 0.0005			75-125 75-125		0.1014 0.1082	1	0.1 0.9	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	104	80-120	500	17W4313q	480	985	101	75-125	985	985	101	0.0	20	-	-	< 1 < 1
Chloride mg/l	30.0 30.0	89 90	80-120 80-120	1 1	17-W4318	< 1	26.8	89	80-120	26.8	25.6	85	4.6	20	-	-	< 1 < 1
Chromium - Dissolved mg/l	0.1000	98	80-120	0.100 0.100	17W4312q 17W4318q	< 0.002 < 0.002	0.1004 0.0966		75-125 75-125				0.2 2.7	20 20		-	< 0.002
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	5276 13891	4990 13928		5.6 0.3	20 20	-	-	-
Fluoride mg/l	0.50	94	90-110	0.500 0.500	17-W4311 17-W4314	0.22 0.93	0.65 1.36	86 86	80-120 80-120		0.66 1.37	88 88	1.5	20 20	-	-	< 0.1 < 0.1
Iron - Dissolved mg/l	0.40	105	80-120	5.00	17W4319q	< 0.5	4.13	83	75-125	4.13	4.46	89	7.7	20	-	-	< 0.1
Lead - Dissolved mg/l	0.1000	102	80-120	0.100 0.100	17W4312q 17W4318q	< 0.0005 < 0.0005	0.0920 0.1002	92 100	75-125 75-125		0.0905 0.1000	90 100	1.6 0.2	20 20	-	-	< 0.0005
Magnesium - Total mg/l	20.0	111	80-120	500	17W4313q	238	745	101	75-125	745	745	101	0.0	20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	108	80-120	5.00	17W4319q	< 0.25	4.20	84	75-125	4.20	4.52	90	7.3	20	-	-	< 0.05
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002 0.002	17-W4312 17-W4417	< 0.0002 < 0.0002	1 1	95 95	70-130 70-130	1 1	0.0019 0.0019		0.0	20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	105	80-120	5.00	17W4319q	< 0.5	4.18	84	75-125	4.18	4.50	90	7.4	20	_	-	< 0.1
Nitrate-Nitrite as N mg/l	0.50	94	90-110	1.00	17-W4312	0.20	1.13	93	90-110	1.13	1.21	101	6.8	20	_	-	< 0.1

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Page: 2 of 2

Quality Control Report Lab ID: 17-W4319

Lab ID: 17-W4319 Project: MDU Heskett Work Order: 201782-2798

200 201 17 17 12 12	LCS	LCS	LCS	Matrix	Matrix	Matrix Spike	Matrix	Matrix	Matrix Spike		MSD/	MSD	MSD/	MSD/ Dup	Known	Known	
Analyte	Spike Amt	Rec %	% Rec Limits	Spike Amt	Spike ID	Orig Result	Spike Result	Rec %	% Rec Limits	Orig Result	Dup Result	Rec %	Dup RPD	RPD Limit (<)	Rec (%)	% Rec Limits	Method Blank
pH units	TI,	3			9°-0 1-27		-	10-1	13	12.2 7.4	12.1 7.5	9	0.8 1,3	20 20	-	2	16.
Phosphorus as P - Total mg/l	0.50	104	90-110	1.00 2.00	17-W4317 17-W4327	0.05 7.48	1.13 9.46	108 99	90-110 90-110	1 5000	1.06 9.68	101 110	6.4 2.3	20 20	1	1.	< 0.1
Potassium - Total mg/l	10.0	95	80-120	100	17W4313q	12.2	110	98	75-125	110	111	99	0.9	20	:	1	<1 <1
Selenium - Dissolved mg/l	0.1000	92	80-120	0.400	17-W4504Q	0.0301	0.4540	106	75-125	0.4540	0.4584	107	1.0	20	500	T.	< 0.002
Silver - Dissolved mg/l	0.1000	93	80-120	0.100 0.100	17W4312q 17W4318q	< 0.0005 < 0.0005	A STATE YEAR	0.000	75-125 75-125	11 15 15 15 15 15 15 15 15 15 15 15 15 1	0.0936 0.1053	200	1.8 2.6	20 20		3	< 0.0005
Sodium - Total mg/l	20.0	108	80-120	500	17W4313q	620	1040	84	75-125	1040	1100	96	5.6	20		1	<1 <1
Sulfate mg/l	100	89	80-120	4000	17-W4316	2960	7040	102	80-120	7040	6920	99	1.7	20	1.67	18	< 5
Total Alkalinity mg/l CaCO3	410	92	90-110	410 410	17-D3598 17-W4312	189 489	554 841	89 86	80-120 80-120	1 1 2 2 2	556 841	90 86	0.4	20 20	89	80-120	< 20 < 20

Approved by:	C. Cano
	1NOV17



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CERTIFICATE of ANALYSIS - STATE

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

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: October 2017

1 of 2 Page:

Report Date: 26 Oct 17 Lab Number: 17-W4319 Work Order #: 82-2798 Account #: 002800

Date Sampled: 5 Oct 17 12:47 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	6 Oct 17	EMS
Conductivity (EC)	9645	umhos/cm	1	SM2510-B	9 Oct 17 17:00	SVS
pH - Field	6.85	units	NA	SM 4500 H+ B	5 Oct 17 12:47	DJN
pH - FIEIG	* 7.3	units	0.1	SM4500 H+ B	9 Oct 17 17:00	svs
Temperature - Field	11.4	Degrees C	NA	SM 2550B	5 Oct 17 12:47	DJN
Total Alkalinity	293	mg/l CaCO3	20	SM2320-B	10 Oct 17 17:00	SVS
Bicarbonate	293	mg/1 CaCO3	20	SM2320-B	10 Oct 17 17:00	SVS
Carbonate	< 20	mg/l CaCO3	20	SM2320-B	10 Oct 17 17:00	svs
F(2) = (2) = (3) (2) (2) (2)	< 20	mg/l CaCO3	20	SM2320-B	10 Oct 17 17:00	SVS
Hydroxide Conductivity - Field	9736	umhos/cm	1	EPA 120.1	5 Oct 17 12:47	DJN
	8900	mg/1	12.5	SM1030-F	19 Oct 17 10:53	Calculated
Tot Dis Solids(Summation) Total Hardness as CaCO3	4620	mg/1	NA	SM2340-B	16 Oct 17 14:30	Calculated
Cation Summation	155	meg/L	NA	SM1030-F	16 Oct 17 14:30	Calculated
	131	meq/L	NA	SM1030-F	19 Oct 17 10:53	Calculated
Anion Summation	8.13	8	NA	SM1030-F	19 Oct 17 10:53	Calculated
Percent Error	9.09	*	NA	USDA 20b	16 Oct 17 14:30	Calculated
Sodium Adsorption Ratio	1.02	mg/l	0.10	SM4500-F-C	9 Oct 17 17:00	SVS
Fluoride	5900	mg/1	5,00	ASTM D516-07	10 Oct 17 16:14	RAG
Sulfate	87.8	mg/1	1.0	SM4500-C1-E	11 Oct 17 15:17	RAG
Chloride	4.02	mg/1	0.10	EPA 353.2	19 Oct 17 10:53	EMS
Nitrate-Nitrite as N			0.10	EPA 365.1	11 Oct 17 11:10	EMS
Phosphorus as P - Total	< 0.1	mg/1	0.0002	EPA 245.1	13 Oct 17 12:55	EV
Mercury - Dissolved	< 0.0002	mg/1	1.0	6010D	16 Oct 17 14:30	SZ
Calcium - Total	424	mg/1	1.0	6010D	16 Oct 17 14:30	SZ
Magnesium - Total	865	mg/1	1.0	6010D	16 Oct 17 14:30	SZ
Sodium - Total	1420	mg/1	1.0	6010D	16 Oct 17 14:30	SZ
Potassium - Total	23.6	mg/1	0.10	6010D	10 Oct 17 17:00	SZ
Barium - Dissolved	< 0.5 ⊚	mg/l	0.10	6010D	10 Oct 17 17:00	SZ
Iron - Dissolved	< 0.5 @	mg/1		6010D	10 Oct 17 17:00	SZ
Manganese - Dissolved	< 0.25 @	mg/1	0.05		10 Oct 17 17:00	SZ
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D 6010D	13 Oct 17 14:23	SZ
Boron - Dissolved	< 0.5 @	mg/l	0.10		25 Oct 17 12:42	BT
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	25 Oct 17 12:42	BT
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	25 Oct 17 12:42	BT
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	25 Oct 17 12:42 25 Oct 17 12:42	BT
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	25 OCC 17 12:42	20.0

RL = Method Reporting Limit

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

CERTIFICATION: ND # ND-00016



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CERTIFICATE of ANALYSIS - STATE

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

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: October 2017

2 of 2 Page:

Report Date: 26 Oct 17 Lab Number: 17-W4319 Work Order #: 82-2798 Account #: 002800

Date Sampled: 5 Oct 17 12:47 Date Received: 6 Oct 17 8:00 Sampled By: MVTL Field Services

PO #: 165275

Temp at Receipt: 4.2C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Selenium - Dissolved	0,0048 mg/l	0.0020	6020B	25 Oct 17 16:35	
Silver - Dissolved	< 0.0005 mg/l	0.0005	6020B	24 Oct 17 17:52	

* Holding time exceeded

Approved by:

Claudette K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

= Due to concentration of other analytes

CERTIFICATION: ND # ND-00016

* = Due to internal standard response



Phone: (701) 258-9720

Field Datasheet

Company:	MDU Heskett	
Event:	2017	
Carranta ID:	100	

Groundy	<i>w</i> ater Ass	essment
---------	-------------------	---------

Sampling Personal: Pamen Wiesung

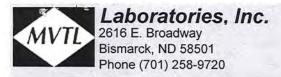
Weather Conditions:		Temp:	(0 °F	Wir	nd: Ciahi	F	Precip	: Suni	ny / Partly C	loudy / C	loudy
•	Well Info	ormation					Sampling	Informatio	on		-
Well Locked?	Yes	(NO			Purgi	ng Method:	Bladder		Co	ntrol Setti	ngs
Well Labeled?	Yes	^{>} No			Sampli	ng Method:	Bladder		Purge:	3	sec.
Casing Straight?	Yes	No			Dedicat	ted Equip?:	Yes No		Recover:	55	sec.
Grout Seal Intact?	(Yes)	No No	Not Vis	īble /	Duplicate	Sample?:	Yes (No		PSI:	15.	
Repairs Necessary:					Duplicate	Sample ID:			Pumping Ra	ate: / 🔊	<i>O</i> m∐min
Casing	Diameter:		2"								
Water Level Befo	re Purge:	1	1,76	ft	F	urge Date:	50417	Time Purg	ing Began:	1222	am/pom
Total W	ell Depth:			ft	Well P	urged Dry?	Yes (No)	Time F	urged Dry:		am/pm
We	ll Volume:			liters	Sa	mple Date:	SOUTH	Time of	f Sampling:	124	7 am/pm
Depth to Top	of Pump:			ft			,				
Water Level Afte	r Sample:		1,83	ft	Bottle	1L	Raw, 500mL Nitirc, 5	00mL Nitric	(filtered), 25	0 mL Sulf	uric
Measurement	t Method:	Electric	Water Level In	dicator	List:						
				Field Meas	uromonto	·		·	·	·	

Field Measurements

	ization secutive)	Temp (°C)	Spec. Cond.	рН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Water Level (ft)	mL Removed	Discription: Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft		clear, slightly turbid, turbid
1	1227	11.21	9015	6.85	3,27	271.6	0.82	11.80	500	C5_
2	1232	11117	9768	6.85	2.33	269,0	0.46	11.83	500	Ch
3	1237	1137	19741	6.86	1,80	266,6	0,26	11.83	500	de
4	1242		9742	6186	1.71.	2/6/10	0,27	11.83	(20)	cl
5	1247	11,37	9736	6,85	1,68	26018	0,33	11.83	500	d
6	,	,						. 0		
7										
8										
9										
10										
Stabilized:	Yes	No				To	otal Volume	Removed:	225111	ml

No Comments:

Total Volume Removed: 25 1/0 mL



Chain of Custody Record

Project Nam	e:	Event:	Work Order Number:
	MDU Heskett	October 2017	82-2798
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s): Darren Wieswaag

	Samp	ole Information		Bottle Type	Field Parameters	Analysis
Lab Number	Sample ID	Date Time	Sample Type	1 liter 500ml. Nitric 500ml. Nitric (filtered) 250 ml. Sulfuric	Temp (°C) Spec. Cond.	Analysis Required
V4319	1-90	50ct/7 124'	7 GW	x x x x		DU List AA
(<u> </u>						

Comments:

Relinquished By:	Relinquished By:						
Name:	Date/Time	Location:	Temp (°C)				
1 Jan Non	50017	Log In Walk In #2	RIT 4,2 TM562/11M588				
2							

Name:	Date/Time
NBuchnon	6 Oct 17 0800



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CASE NARRATIVE

MVTL Lab Reference No/SDG:

201882-0651

Client:

Montana Dakota Utilities

Location:

MDU Heskett

Project Identification:

NDDH Spring 2018

MVTL Laboratory Identifications:

18-W493

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #		
1-90	18-W493		

I. RECEIPT

- All samples were received at the laboratory on 5 Apr 2018 at 0800.
- Samples were collected and hand delivered by MVTL Field Service personnel to the laboratory.
- Samples were received on ice and evidence of cooling had begun.
 - Temperature of samples upon receipt was 6.4°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

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

III. METHODS

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

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
 - For some analytes, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
 - 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.
 - One alkalinity matrix spike duplicate recovery was outside the acceptable limits. Recovery
 for the matrix spike was acceptable. RPD for the recoveries of the matrix spike duplicate and
 the matrix spike was within limits. No further action was taken.

All laborato	ory data has been appr	oved by MVTL Labora	atories.	1.1	
SIGNED:	Claudotte	anita	DATE:	+May 18	
Cl	audette Carroll - MVTL	Bismarck Laboratory	Manager	-	

MVTL

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Page: 1 of 2

Quality Control Report

Lab ID: 18-W493		Pr	oject:			V	Vork Or	der: 201	882-065	1							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Arsenic - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	18W453q 18W498q	< 0.002 < 0.002	0.1095 0.1060	110 106	75-125 75-125	0.1095 0.1060	0.1082 0.1085	108 108	1.2 2.3	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	105	80-120	1.00	18W456q	< 0.1	0.90	90	75-125	0.90	0.88	88	2.2	20	-	-	< 0.1
Boron - Dissolved mg/l	0.40	108	80-120	2.00	18-W453	0.63	2.37	87	75-125	2.37	2.46	92	3.7	20	_	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W453q 18W498q	< 0.0005 < 0.0005	0.0954 0.0976	95 98	75-125 75-125	0.0954 0.0976	0.0928 0.0985	93 98	2.8 0.9	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	108	80-120	500	18W498q	445	960	103	75-125	960	950	101	1.0	20	-	-	< 1 < 1
Chloride mg/l	30.0	98	80-120	30.0	18-W499	37.8	67.4	99	80-120	67.4	67.9	100	0.7	20	-	-	< 1
Chromium - Dissolved mg/l	0.0160	92	80-120	0.100 0.100	18W453q 18W498q	< 0.002 < 0.002	0.1036 0.0974	104 97	75-125 75-125	0.1036 0.0974	0.1030 0.0995	103 100	0.6 2.1	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	-	_	-	-	-	-	-	-	9600	10602	-	9.9	20	-	-	-
Fluoride mg/l	0.50	102	90-110	0.500	18-M652	0.76	1.26	100	80-120	1.26	1.24	96	1.6	20	-	-	< 0.1 < 0.1
Iron - Dissolved mg/l	0.40	105	80-120	1.00	18W456q	< 0.1	0.82	82	75-125	0.82	0.82	82	0.0	20	_	-	< 0.1
Lead - Dissolved mg/l	0.0160	97	80-120	0.100 0.100	18W453q 18W498q	< 0.001 < 0.001	0.0830 0.0841	83 84	75-125 75-125	0.0830 0.0841	0.0820 0.0860	82 86	1.2 2.2	20 20	-	-	< 0.0005
Magnesium - Total mg/l	20.0	108	80-120	500	18W498q	210	720	102	75-125	720	715	101	0.7	20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	108	80-120	1.00	18W456q	0.09	0.92	83	75-125	0.92	0.97	88	5.3	20	_	-	< 0.05
Mercury - Dissolved mg/l	0.0020	95	85-115	0.002 0.002	18-W497 18-W504	< 0.0002 < 0.0002		90 95	70-130 70-130	0.0018 0.0019	0.0019 0.0018	95 90	5.4 5.4	20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	102	80-120	1.00	18W456q	< 0.1	0.86	86	75-125	0.86	0.86	86	0.0	20	-	-	< 0.1
Nitrate-Nitrite as N mg/l	0.50	102	90-110	10.0	18-W453	5.90	15.4	95	90-110	15.4	15.3	94	0.7	20	-	-	< 0.1
pH units	_	-	-	-	-	-	-	-	-	8.8 7.2	8.5 7.3	-	3.5 1.4	20 20	-		

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Quality Control Report

Lab ID: 18-W493

Project:

Work Order: 201882-0651

			oject.				TOTIC OF	uci. 201	002-005	L .							
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
Phosphorus as P - Total mg/l	0.50	106	90-110	5.00 2.00	18-D1046 18-W392	10.9 4.35	15.8 6.26	98 96	90-110 90-110	15.8 6.26	16.4 6.22	110 93	3.7 0.6	20 20	-	-	< 0.1
Potassium - Total mg/l	10.0	92	80-120	100	18W498q	12.3	112	100	75-125	112	110	98	1.8	20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	106	80-120	0.100 0.100	18W453q 18W498q	0.0451 0.1217	0.1802 0.2216	135 100	75-125 75-125	0.1802 0.2216	0.1678 0.2369	123 115	7.1 6.7	20 20		-	< 0.005
Silver - Dissolved mg/l	0.0160	97	80-120	0.100 0.100	18-W453 18-W498	< 0.0005 < 0.0005	0.0832 0.0850	83 85	75-125 75-125	0.0832 0.0850	0.0814 0.0846	81 85	2.2 0.5	20 20		-	< 0.000
Sodium - Total mg/l	20.0	96	80-120	500	18W498q	550	1040	98	75-125	1040	1020	94	1.9	20	-	-	< 1 < 1
Sulfate mg/l	100	104	80-120	4000	18-M875	744	5330	115	80-120	5330	5180	111	2.9	20	-	-	< 5
Total Alkalinity mg/l CaCO3	410	100	90-110	410 410	18-D1074 18-W476	717 110	1036 436	78 80	80-120 80-120	1036 436	1049 435	81 79	1.2 0.2	20 20	99	80-120	< 20 < 20

Approved by:	C-Cantl)
	4 May 18



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CERTIFICATE of ANALYSIS - STATE

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

Sample Description: 1-90

Sample Site: MDU Heskett Active Ash

Event and Year: Spring 2018

Report Date: 1 May 18 Lab Number: 18-W493 Work Order #: 82-0651 Account #: 002800

Date Sampled: 4 Apr 18 16:11 Date Received: 5 Apr 18 8:00 Sampled By: MVTL Field Services

Temp at Receipt: 6.4C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion		w 1.5.70.00		EPA 200.2	5 Apr 18	svs
Conductivity (EC)	9600	umhos/cm	1	SM2510-B	5 Apr 18 17:00	EMS
pH - Field	6.88	units	NA	SM 4500 H+ B	4 Apr 18 16:1:	
pH	* 7.2	units	0:1	SM4500 H+ B	5 Apr 18 17:00	
Temperature - Field	6.50	Degrees C	NA	SM 2550B	4 Apr 18 16:1:	. DJN
Total Alkalinity	312	mg/1 CaCO3	20	SM2320-B	5 Apr 18 17:00	
Bicarbonate	312	mg/1 CaCO3	20	SM2320-B	5 Apr 18 17:00	EMS
Carbonate	< 20	mg/1 CaCO3	20	SM2320-B	5 Apr 18 17:00	
Hydroxide	< 20	mg/l CaCO3	20	SM2320-B	5 Apr 18 17:00) EMS
Conductivity - Field	9529	umhos/cm	1	EPA 120.1	4 Apr 18 16:1:	DJN
Tot Dis Solids (Summation)	9810	mg/l	12.5	SM1030-F	27 Apr 18 8:4:	Calculated
Total Hardness as CaCO3	4450	mg/l	NA	SM2340-B	10 Apr 18 10:5	Calculated
Cation Summation	149	meg/L	NA	SM1030-F	10 Apr 18 10:5	Calculated
Anion Summation	153	meq/L	NA	SM1030-F	27 Apr 18 8:43	Calculated
Percent Error	-1.34	8	NA	SM1030-F	27 Apr 18 8:4:	Calculated
Sodium Adsorption Ratio	8.87		NA	USDA 20b	10 Apr 18 10:5	Calculated
Fluoride	1.03	mg/1	0.10	SM4500-F-C	5 Apr 18 17:0	EMS
Sulfate	6900	mg/l	5.00	ASTM D516-07	27 Apr 18 8:4:	
Chloride	90.6	mg/1	1.0	SM4500-C1-E	10 Apr 18 14:4:	RAG
Nitrate-Nitrite as N	4.06	mg/1	0.10	EPA 353.2	6 Apr 18 15:5	RAG
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	11 Apr 18 8:4:	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	10 Apr 18 11:5:) EV
Calcium - Total	405	mg/l	1.0	6010D	10 Apr 18 10:5	SZ
Magnesium - Total	835	mg/1	1.0	6010D	10 Apr 18 10:5	7 SZ
Sodium - Total	1360	mg/1	1.0	6010D	10 Apr 18 10:5	SZ
Potassium - Total	24.2	mg/l	1.0	6010D	10 Apr 18 10:5	7 SZ
Barium - Dissolved	< 0.1	mg/1	0.10	6010D	6 Apr 18 13:5	SZ
Iron - Dissolved	< 0.1	mg/l	0.10	6010D	6 Apr 18 13:5	SZ
Manganese - Dissolved	< 0.05	mg/l	0.05	6010D	6 Apr 18 13:5	SZ
Molybdenum - Dissolved	< 0.1	mg/l	0.10	6010D	6 Apr 18 13:5	SZ
Boron - Dissolved	0.27	mg/1	0.10	6010D	5 Apr 18 12:2:	
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	17 Apr 18 11:1:	BT
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	17 Apr 18 11:1:	BT
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	17 Apr 18 11:1:	
Lead - Dissolved	< 0.001	mg/l	0.0005	6020B	17 Apr 18 11:1:	
Selenium - Dissolved	< 0.005	mg/l	0.0050	6020B	17 Apr 18 11:1	
Silver - Dissolved	< 0.0005	mg/l	0.0005	6020B	17 Apr 18 15:5	

RL - Method Reporting Limit

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

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

CERTIFICATION: ND # ND-00016



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2 of 2 Page:

Report Date: 1 May 18 Lab Number: 18-W493

Work Order #: 82-0651

Date Sampled: 4 Apr 18 16:11

Temp at Receipt: 6.4C ROI

Date Received: 5 Apr 18 8:00 Sampled By: MVTL Field Services

Account #: 002800

CERTIFICATE of ANALYSIS - STATE

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

Sample Description: 1-90

Sample Site: MDU Heskett Active Ash

Event and Year: Spring 2018

As Received Result

Method RL

Method Reference

Date Analyzed

Analyst

* Holding time exceeded

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

Approved by:

Clauditte K Canteo CC 4May 10

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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

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

CERTIFICATION: ND # ND-00016



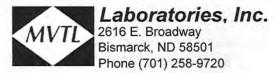
Field Datasheet

Groundwater Assessment

Company:	MDU Heskett	
Event:	Spring 2018	
Sample ID:	1-90	
Sampling Personal:	Parren Niesman	

Phone: (701) 258-9720

Weather Co	nditions:		Temp:	36	°F	Wind:	12/	@ 5		Precip:	Suni	ny) Partly (loudy / Cl	oudy
		Well Info	ormation	<i></i>					Sa	ampling I	nformation	on		
Well	Locked?	Yes	(No)				Purgi	ng Method:	Blac	dder				
Well	Labeled?	Yes	No				Sampli	ng Method:	Bladder			Control Sett		gs
Casing	Straight?	Yes	No				Dedicated Equip?:		Yes	No		Purge:	5	
Grout Se	al Intact?	Yes	No	(Not y	/isible		Duplicate Sample?:		Yes	(No)		Recover:	55	
Repairs Nec	essary:						Duplicate	Sample ID:				PSI:		
	Casing	Diameter:		2"						,		·····		
Water	Level Bef	ore Purge:	1	1,51	ft		F	Purge Date:	4ADr	18-	Time Purg	ing Began:	1541	ar
							Well P	urged Dry?	Yes	(No)	Time F	urged Dry:		ar
							Sa	ample Date:	4 April	8	Time of	Sampling:	1611	ar
De	epth to To	p of Pump:	10	1.35	ft					7				
Water	Level Aft	er Sample:		11.58	ft		Bottle	1L Raw		250mL Su	lfuric			
Me	Measurement Method: Electric Water Level Indicator List: 500mL Nitric 500mL Nitric (filtered)													
					Field	Measure	ments							
Stabiliza	ation	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL		Description:		l
(3 consec	cutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed		, Color, Odo		
SEQ#	Time	/	±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min			Slightly Turbid,		l
1 /	1546	6,28	9542	6.88	1.38	57.4	0.88	11.62	100	500	Ch			l
2	1556	6,49	9510	6,90	1,12	56,7	0.93	11.58	100	000	de	_		
3	1,60	6,43	9517	6.90	1018	57.1	0.60	11.58	100	500	e			
4	1606	6,43	9532	6,88	1,10	57.0	0,56	11,58	100	500	a			
5	1611	6,50	9529	6.88	1.14	510	0.58	11.58	100	500	Ch_			
6														
7														
8 9								-						
10														
Stabilized: /	Yes	No			I	1	Т	otal Volume	L e Removed:	0020	mL			
Comments	1.50	/	•				· '	otal volume	ricinoveu.	<u> </u>				



Chain of Custody Record

Project Name:		Event:	Work Order Number: 101882-0651					
	MDU Heskett	Spring 2018		101285-0021				
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 400 N. 4th St Bismarck, ND 58501 701-222-7829	Carbon Copy: Attn: Address:	Name of Sampler(s): Darren 1	Vieswaag				

	Sam	ple Informatio	on /	1 1	Bottle Type			
Lab Number	Sample ID	Date	Time	Sample Type	1 liter 500mL Nitric 500mL Nitric (filtered) 250 mL Sulfuric	Temp (°C) Spec. Cond.	Analysis Required	
W 493	1-90	4April8	1601	GW	x x x x	6.50 9529 6.88	MDU List AA	

Comments:

Relinquished By:	Sample Condition:				
Name:	Date/Time	Location:	Temp (°C)		
1 Jana Nay	4 Apr 18	Log In Walk In #2	ROJ 6.4 TM562/TM588		
2					

Name:	Date/Time
al t	, 0800
Muchbran	5 April 18



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CASE NARRATIVE

MVTL Lab Reference No/SDG:

201882-2618

Client:

Montana Dakota Utilities

Location:

MDU Heskett

Project Identification:

NDDH Fall 2018

MVTL Laboratory Identifications:

18-W3260

Page 1 of 1

MDU Sample Identification	MVTL Laboratory #
1-90	18-W3260

I. RECEIPT

- All samples were received at the laboratory on 4 Oct 2018 at 1307.
- 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 3.1°C.
- All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.
- No other exceptions on sample receipt were encountered on this sample set unless noted here.

II. HOLDING TIMES

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

III. METHODS

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

IV. ANALYSIS

- All acceptance criteria was met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/matrix duplicates unless noted here and/or flagged on the individual analytical laboratory report.
 - For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
 - The recoveries for two selenium matrix spikes/matrix spike duplicates were outside the acceptable limits. RPDs for the recoveries were within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

All laboratory data has been approved by MVTL Laboratories.

SIGNED: Date DATE: 250CT18

Claudette Carroll - MVTL Bismarck Laboratory Manager



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Quality Control Report

Lab ID: 18-W3260		Pr	oject: MI	DU Heske	ett	7	Work Or	der: 201	882-2618	3							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	18W3261q 18W3266q	< 0.002 < 0.002	0.1150 0.1212	115 121	75-125 75-125	0.1150 0.1212	0.1140 0.1144	114 114	0.9 5.8	20 20	-		< 0.002
Barium - Dissolved mg/l	0.40	110	80-120	0.400	18W3250q	0.12	0.52	100	75-125	0.52	0.53	102	1.9	20	-	-	< 0.1 < 0.1
Boron - Dissolved mg/l	0.40 0.40 0.40 0.40	108 112 108 108	80-120 80-120 80-120 80-120	2.00	18-W3261	0.38	2.38	100	75-125	2.38	2.57	110	7.7	20		- - -	< 0.1
Cadmium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	18W3261q 18W3266q	< 0.0005 < 0.0005	0.1044 0.1108	104 111	75-125 75-125	0.1044 0.1108	0.1041 0.1037	104 104	0.3 6.6	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	102	80-120	500	18W3252q	240	705	93	75-125	705	715	95	1.4	20	-	-	<1 <1
Chloride mg/l	30.0 30.0	98 102	80-120 80-120	30.0	18-W3171	< 2	28.3	94	80-120	28.3	27.7	92	2.1	20	_	-	< 2 < 2
Chromium - Dissolved mg/l	0.0160	103	80-120	0.100 0.100	18W3261q 18W3266q	< 0.002 < 0.002	0.1008 0.1093	101 109	75-125 75-125	0.1008 0.1093	0.1010 0.1048	101 105	0.2 4.2	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	- - -	- - -	-	- - -	-	-			1514 1264 6904	1520 1275 7451	-	0.4 0.9 7.6	20 20 20	- - -	-	-
Fluoride mg/l	0.50 0.50	98 100	90-110 90-110	0.500 0.500	18-W3274 18-W3261	< 0.1 0.19	0.58 0.65	116 92	80-120 80-120	0.58 0.65	0.58 0.65	116 92	0.0	20 20	-	-	< 0.1 < 0.1
lron - Dissolved mg/l	0.40	110	80-120	0.400	18W3250q	0.22	0.66	110	75-125	0.66	0.66	110	0.0	20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	18W3261q 18W3266q	< 0.0005 < 0.0005	0.0944 0.1024	94 102	75-125 75-125	0.0944 0.1024	0.0932 0.0965	93 96	1.3 5.9	20 20	-	-	< 0.0005
Magnesium - Total mg/l	20.0	100	80-120	100	18W3252q	100	191	91	75-125	191	189	89	1.1	20	_	-	< 1 < 1



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Quality Control Report
Lab ID: 18-W3260

Lab ID: 18-W3260 Project: MDU Heskett Work Order: 201882-2618

Lab ID: 18-W3260		<u>Pr</u>	oject: MI	OU Heske	ett	Work Order: 201882-2618											
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
Manganese - Dissolved mg/l	0.40	112	80-120	0.400	18W3250q	< 0.05	0.44	110	75-125	0.44	0.45	112	2.2	20	-	-	< 0.05 < 0.05
Mercury - Dissolved mg/l	0.0020	110	85-115	0.002	18-W3267	< 0.0002	0.0017	85	70-130	0.0017	0.0021	105	21.1	20	-	+	< 0.0002
Molybdenum - Dissolved mg/l	0.40	108	80-120	0.400	18W3250q	< 0.1	0.42	105	75-125	0.42	0.42	105	0.0	20	-	_	< 0.1 < 0.1
Nitrate-Nitrite as N mg/l	0.50	102	90-110	2.00	18-W3261	< 0.1	1.88	94	90-110	1.88	1.80	90	4.3	20	-		< 0.1
pH units	-	-	-	-	-	-	-	-	-	8.2 7.8 7.0	8.2 7.9 7.1	-	0.0 1.3 1.4	20 20 20	- -	-	-
Phosphorus as P - Total mg/l	0.50	110	90-110	1.00 1.00	18-W3180 18-W3333	< 0.1 < 0.1	1.01 1.05	101 105	90-110 90-110	1.01 1.05	1.04 1.07	104 107	2.9 1.9	20 20	-	-	< 0.1
Potassium - Total mg/l	10.0	98	80-120	20.0	18W3252q	8.7	28.2	98	75-125	28.2	27.9	96	1.1	20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	105	80-120	0.100 0.100	18W3261q 18W3266q	< 0.005 < 0.005	0.1310 0.1405	131 140	75-125 75-125	0.1310 0.1405	0.1300 0.1362	130 136	0.8	20 20	-	_	< 0.005
Silver - Dissolved mg/l	0.0160	105	80-120	0.100 0.100	18W3261q 18W3266q	< 0.0005 < 0.0005	0.0986 0.1052	99 105	75-125 75-125	0.0986 0.1052	0.0989 0.0966	99 97	0.3 8.5	20 20	-	-	< 0.0005
Sodium - Total mg/l	20.0	102	80-120	100	18W3252q	119	211	92	75-125	211	207	88	1.9	20		-	< 1 < 1
Sulfate mg/l	100	94	80-120	500	18-W3252	735	1250	103	80-120	1250	1210	95	3.3	20	-	-	< 5
Total Alkalinity mg/l CaCO3	410 410	97 98	90-110 90-110	410 410	18-W3273 18-W3260	276 327	650 710	91 93	80-120 80-120	650 710	647 708	90 93	0.5 0.3	20 20	96	80-120	< 20 < 20

Approved by: Can TD



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CERTIFICATE of ANALYSIS - STATE

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2018

1 of 2 Page:

Report Date: 18 Oct 18 Lab Number: 18-W3260 Work Order #: 82-2618 Account #: 002800

Date Sampled: 4 Oct 18 11:50 Date Received: 4 Oct 18 13:07 Sampled By: MVTL Field Services

PO #: 169846 OP

Temp at Receipt: 3.1C ROI

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	4 Oct 18	svs
Conductivity (EC)	9576	umhos/cm	1	SM2510-B	4 Oct 18 17:	00 SVS
pH - Field	6.74	units	NA	SM 4500 H+ B	4 Oct 18 11:	
pH - Field	* 7.2	units	0.1	SM4500 H+ B	4 Oct 18 17:	00 SVS
Ph Temperature - Field	9.71	Degrees C	NA	SM 2550B	4 Oct 18 11:	50 JSM
Total Alkalinity	327	mg/1 CaCO3	20	SM2320-B	4 Oct 18 17:	00 SVS
	327	mg/l CaCO3	20	SM2320-B	4 Oct 18 17:	00 SVS
Bicarbonate	< 20	mg/1 CaCO3	20	SM2320-B	4 Oct 18 17:	00 SVS
Carbonate	< 20	mg/1 CaCO3	20	SM2320-B	4 Oct 18 17:	00 SVS
Hydroxide	9592	umhos/cm	1	EPA 120.1	4 Oct 18 11:	
Conductivity - Field	9490	mg/1	12.5	SM1030-F	17 Oct 18 12:	16 Calculated
Tot Dis Solids (Summation)	4430	mg/1	NA	SM2340-B	12 Oct 18 15:	28 Calculated
Total Hardness as CaCO3	153	meg/L	NA	SM1030-F	12 Oct 18 15:	28 Calculated
Cation Summation	144	meq/L	NA	SM1030-F	17 Oct 18 12:	16 Calculated
Anion Summation	2.83	#	NA	SM1030-F	17 Oct 18 12:	16 Calculated
Percent Error	9.54		NA	USDA 20b	12 Oct 18 15:	28 Calculated
Sodium Adsorption Ratio	1.03	mg/1	0.10	SM4500-F-C	4 Oct 18 17:	
Fluoride		mg/1	5.00	ASTM D516-07	10 Oct 18 12:	
Sulfate	6480	mg/1	1.0	SM4500-C1-E	17 Oct 18 12:	
Chloride	86.2	mg/1	0.10	EPA 353.2	8 Oct 18 15	
Nitrate-Nitrite as N	5.80		0.10	EPA 365.1	15 Oct 18 11:	
Phosphorus as P - Total	< 0.1	mg/1	0.0002	EPA 245.1	12 Oct 18 14:	
Mercury - Dissolved	< 0.0002	mg/1	1.0	6010D	12 Oct 18 15	THE STATE OF THE S
Calcium - Total	406	mg/l	1.0	6010D	12 Oct 18 15	
Magnesium - Total	830	mg/1	1.0	6010D	12 Oct 18 15	The second second
Sodium - Total	1460	mg/l	1.0	6010D	12 Oct 18 15	77.7
Potassium - Total	24.8	mg/1		6010D	11 Oct 18 11	TO TO
Barium - Dissolved	< 0.5 @	mg/l	0.10	6010D	11 Oct 18 11	
Iron - Dissolved	< 0.5 ⊚	mg/l	0.10	70.7	11 Oct 18 11	
Manganese - Dissolved	< 0.25 @	mg/1	0.05	6010D	11 Oct 18 11	
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D	8 Oct 18 13	7.7
Boron - Dissolved	< 0.5 @	mg/l	0.10	6010D	5 Oct 18 11	
Arsenic - Dissolved	< 0.002	mg/l	0.0020	6020B	5 Oct 18 11	7.0
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	5 Oct 18 11 5 Oct 18 11	70 77
Chromium - Dissolved	< 0.002	mg/l	0.0020	6020B	7 755 50 50	
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	5 Oct 18 11	U, PP

RL - Method Reporting Limit

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

= Due to sample matrix # = Due to come ! = Due to sample quantity # = Due to into

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



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CERTIFICATE of ANALYSIS - STATE

Samantha Marshall Montana Dakota Utilities 5181 Southgate Dr Billings MT 59102

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2018

2 of 2 Page:

Report Date: 18 Oct 18 Lab Number: 18-W3260 Work Order #: 82-2618 Account #: 002800

Date Sampled: 4 Oct 18 11:50 Date Received: 4 Oct 18 13:07 Sampled By: MVTL Field Services

PO #: 169846 OP

Temp at Receipt: 3.1C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst	
Selenium - Dissolved	< 0.005 mg/l	0.0050	6020B	5 Oct 18 11:07	BB	
Silver - Dissolved	< 0.0005 mg/l		6020B	5 Oct 18 11:07	BB	

* Holding time exceeded

Approved by:

Claudette K Canteo 250CT18

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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



Field Datasheet

Groundwater Assessment

Company:	MDU Heskett	
Event:	Fall 2018	
Sample ID:	. 1-90,	
Sampling Personal:	Jen My	

2010 21 210 44 14 17 11 17								ournpining i					
Phone: (701) 258-9	720						_				('		
Weather Conditions:		Temp:	40°F		Wind:	S	@ 5-14	7	Precip	: Suni	ny / Partiy C	loudy / Cl	oudy
	Well Info	rmation						Sa	mpling l	nformatio	on		
Well Locked?	Yes	No				Purgi	ng Method:	Blade	der				
Well Labeled?	Xes?	No				Sampli	ng Method:	Blad	der		Co	ntrol Settir	ngs
Casing Straight?	Yes	No				Dedica	ted Equip?:	Yes	No		Purge:	5	sec
Grout Seal Intact?	Yes	No	Not Visi	ble		Duplicate	Sample?:	Yes	(N)		Recover:	55	sec
Repairs Necessary:		-				Duplicate	Sample ID:				PSI:	10	
Casing	Diameter:		2"										
Water Level Befo	ore Purge:	ľ	2,01	ft		F	Purge Date:	4 Oct	18	Time Purg	ing Began:	1110	@m/pr
						Well F	urged Dry?	Yes	(No)	Time F	urged Dry:		am/pr
						Sa	ample Date:	4 Oct	18	Time of	f Sampling:	1150	am/pr
Depth to Top	o of Pump:			ft									
Water Level Afte		l	2.15	ft		Bottle	1L Raw	500mL	Nitric	500mL Nit	ric (filtered)	250mL	Sulfuric
Measuremen	t Method:	Electric W	ater Level Ind	icator		List:							
			-	Field	Measure	ments							

Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1115	9.69	9530	6.79	2.06	2500	0,89	12.11	100.0	Sw.0	Cles
2	1135	9,51	9538	6.75	1,35	255,4	1,08	12,14	100,0	2000.0	Clean
3	1140	9.81	9563	6.75	1.26	253,5	0.99	12,19	100.0	5000	clean
4	1145	9,55	9589	6.77	1.29	235.2	1,02	12,12	100.0	500.0	Che
5	1150	9.71	9592	6.74	1,20	238,4	0,98	12.1B	100.0	500,0	Ckar
6											
7											
8											
9											
10										(

Stabilized: Yes) No Total Volume Removed: 4000.0 mL



Chain of Custody Record

Project Nam	ne:	Event:	Work Order Number:	82-2/018
	MDU Heskett	Fall 2018		02-2618
Report To: Attn: Address: phone: email:	MDU Samantha Marshall 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s):	

Field Para	Fi	1	Bottle Type				-	Sample Information					
2 0	Temp (°C)			250 mL Sulfuric	Nitric	13	1 liter		Sample Type	Time	Date	Sample ID	Lab Number
9592	9.71			Х	Х	Х	Х		GW	1150	40ct 18	1-90	W3260

Relinquished By:		Sam	ple Condition:
Name:	Date/Time	Location:	Temp (°C)
CH-Vh/	40c+18 1307	Cog In Walk In #2	3.1 PO1 7M562/TM588
2			

Receive	d by:
/ Name:	Date/Time
10.0	40008
	1307



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Quality Control Report

Lab ID: 19-W596	'	Pı	roject: MI	DU Heske	ett	Work Order: 201982-0660											
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
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	19W587q 19W596q	< 0.002 < 0.002	0.1146 0.1124	115 112	75-125 75-125	0.1146 0.1124	0.1066 0.1130	107 113	7.2 0.5	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	100	80-120	5.00	19W592q	< 0.5	4.98	100	75-125	4.98	4.98	100	0.0	20	_	_	< 0.1
Boron - Dissolved mg/l	0.40 0.40	95 100	80-120 80-120	0.400	19-W588	0.16	0.58	105	75-125	0.58	0.52	90	10.9	20	-	-	< 0.1
Cadmium - Dissolved mg/l	0.0160	106	80-120	0.100 0.100	19W587q 19W596q	< 0.0005 < 0.0005	0.1049 0.1001	105 100	75-125 75-125	0.1049 0.1001	0.1030 0.1036	103 104	1.8 3.4	20 20	-		< 0.0005
Calcium - Total mg/l	20.0	104	80-120	500	19W592q	328	915	117	75-125	915	930	120	1.6	20	-	-	< 1 < 1
Chloride mg/l	30.0 30.0	97 97	80-120 80-120	30.0	19-W593	< 1	28.4	95	80-120	28.4	29.6	99	4.1	20	- 1	-	< 1 < 1
Chromium - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	19W587q 19W596q	< 0.002 < 0.002	0.0995 0.1066	100 107	75-125 75-125	0.0995 0.1066	0.0956 0.1041	96 104	4.0 2.4	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	1610 475	1606 471		0.2 0.8	20 20	-	-	-
Fluoride mg/l	0.50	110	90-110	0.500	19-W596	1.06	1.50	88	80-120	1.50	1.50	88	0.0	20	-	-	< 0.1 < 0.1
Iron - Dissolved mg/l	0.40	102	80-120	5.00	19W592q	< 0.5	5.00	100	75-125	5.00	5.05	101	1.0	20	-	-	< 0.1
Lead - Dissolved mg/l	0.0160	100	80-120	0.100 0.100	19W587q 19W596q	< 0.0005 < 0.0005	0.0944 0.0937	94 94	75-125 75-125	0.0944 0.0937	0.0897 0.0937	90 94	5.1 0.0	20 20	1	-	< 0.0005
Magnesium - Total mg/l	20.0	104	80-120	500	19W592q	640	1190	110	75-125	1190	1200	112	0.8	20		-	< 1 < 1
Manganese - Dissolved mg/l	0.40	105	80-120	5.00	19W592q	0.29	5.35	101	75-125	5.35	5.40	102	0.9	20	•	-	< 0.05
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	19-W596	< 0.0002	0.0018	90	70-130	0.0018	0.0018	90	0.0	20		-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	100	80-120	5.00	19W592q	< 0.5	4.76	95	75-125	4.76	4.88	98	2.5	20		-	< 0.1
Nitrate-Nitrite as N mg/l	0.50	92	90-110	2.00	19-W595	< 0.1	1.78	89	90-110	1.78	1.78	89	0.0	20	-	-	< 0.1



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Page: 2 of 2

Quality Control Report

Lab ID: 19-W596 Project: MDU Heskett Work Order: 201982-0660

Lab 1D. 17- W 370	ID: 17-W570 Troject: WIDO Heskett									Work Order: 201702-0000							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
pH units	-	-	-	-	-	-	-	-	-	8.2 7.3	8.2 7.3	-	0.0	20 20	-	-	-
Phosphorus as P - Total mg/l	0.50	106	90-110	1.00	19-W596	< 0.1	0.92	92	90-110	0.92	0.92	92	0.0	20	-	-	< 0.1
Potassium - Total mg/l	10.0	93	80-120	100	19W592q	15.2	122	107	75-125	122	124	109	1.6	20	- -	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	19W587q 19W596q	0.0785 0.0080	0.1966 0.1424	118 134	75-125 75-125	0.1966 0.1424	0.1794 0.1402	101 132	9.1 1.6	20 20	-	-	< 0.005
Silver - Dissolved mg/l	0.0160	108	80-120	0.100 0.100	19W587q 19W596q	< 0.001 < 0.001	0.1097 0.1079	110 108	75-125 75-125	0.1097 0.1079	0.1043 0.1067	104 107	5.0 1.1	20 20	- -	-	< 0.0005
Sodium - Total mg/l	20.0	104	80-120	500	19W592q	635	1180	109	75-125	1180	1180	109	0.0	20	-	-	< 1 < 1
Sulfate mg/l	100	102	80-120	100	19-W593	< 5	100	100	80-120	100	102	102	2.0	20	-	-	< 5
Total Alkalinity mg/l CaCO3	410	96	90-110	410 410	19-D937 19-W595	401 142	737 518	82 92	80-120 80-120	737 518	776 518	91 92	5.2 0.0	20 20	95	80-120	< 20 < 20

Samples were received in good condition on 3 Apr 2019 at 1420.

Temperature upon receipt at the Bismarck laboratory was 6.5°C. Samples were received on ice and evidence of cooling had begun.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- For some analytes, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
- The recoveries for one selenium matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- The recoveries for one nitrate matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.

Approved by:	C. Canto
	7 May 19



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1 of 2 Page:

CERTIFICATE of ANALYSIS - STATE

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

Project Name: MDU Heskett Sample Description: 1-90

Event and Year: Spring 2019

Report Date: 24 Apr 19 Lab Number: 19-W596 Work Order #:82-0660 Account #: 002800

Date Sampled: 3 Apr 19 13:10 Date Received: 3 Apr 19 14:20 Sampled By: MVTL Field Services

Temp at Receipt: 6.5C ROI

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion	- T. O. T.	V-9		EPA 200.2	3 Apr 19	svs
Conductivity (EC)	9616	umhos/cm	1	SM2510-B	4 Apr 19 17:0	
pH - Field	6.64	units	NA	SM 4500 H+ B	3 Apr 19 13:1	
pH	* 7.2	units	0.1	SM4500 H+ B	4 Apr 19 17:0	
Temperature - Field	6.51	Degrees C	NA	SM 2550B	3 Apr 19 13:1	
Total Alkalinity	322	mg/1 CaCO3	20	SM2320-B	4 Apr 19 17:0	
Bicarbonate	322	mg/l CaCO3	20	SM2320-B	4 Apr 19 17:0	
Carbonate	< 20	mg/l CaCO3	20	SM2320-B	4 Apr 19 17:0	
Hydroxide	< 20	mg/l CaCO3	20	SM2320-B	4 Apr 19 17:0	
Conductivity - Field	9342	umhos/cm	1	EPA 120.1	3 Apr 19 13:1	
Tot Dis Solids (Summation)	9740	mg/l	12.5	SM1030-F	11 Apr 19 8:4	
Total Hardness as CaCO3	4510	mg/l	NA	SM2340-B	4 Apr 19 13:3	
Cation Summation	154	meg/L	NA	SM1030-F	4 Apr 19 13:3	6 Calculated
Anion Summation	149	meg/L	NA	SM1030-F	11 Apr 19 8:4	
Percent Error	1.49	8	NA	SM1030-F	11 Apr 19 8:4	
Sodium Adsorption Ratio	9.40		NA	USDA 20b	4 Apr 19 13:3	
Fluoride	1.06	mg/1	0.10	SM4500-F-C	4 Apr 19 17:0	
Sulfate	6730	mg/1	5.00	ASTM D516-07	11 Apr 19 8:4	
Chloride	81.2	mg/1	1.0	SM4500-C1-E	3 Apr 19 15:1	
Nitrate-Nitrite as N	6.05	mg/1	0.10	EPA 353.2	10 Apr 19 9;4	
Phosphorus as P - Total	< 0.1	mg/1	0.10	EPA 365.1	5 Apr 19 11:0	
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	4 Apr 19 13:0	
Calcium - Total	412	mg/1	1.0	6010D	4 Apr 19 13:3	
Magnesium - Total	845	mg/l	1.0	6010D	4 Apr 19 13:3	
Sodium - Total	1450	mg/1	1.0	6010D	4 Apr 19 13:3	6 SZ
Potassium - Total	23.9	mg/l	1.0	6010D	4 Apr 19 13:3	
Barium - Dissolved	< 0.5 @	mg/l	0.10	6010D	3 Apr 19 17:3	2 SZ
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010D	3 Apr 19 17:3	
Manganese - Dissolved	< 0.25 @	mg/1	0.05	6010D	3 Apr 19 17:3	2 SZ
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D	3 Apr 19 17:3	2 SZ
Boron - Dissolved	< 0.5 @	mg/1	0.10	6010D	8 Apr 19 14:3	
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	18 Apr 19 14:5	
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	18 Apr 19 14:5	8 CC
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	18 Apr 19 14:5	8 CC
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	18 Apr 19 14:5	8 CC
Selenium - Dissolved	0.0080	mg/1	0.0050	6020B	18 Apr 19 14:5	8 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 conduct to the pure to in

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



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CERTIFICATE of ANALYSIS - STATE

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

Project Name: MDU Heskett Sample Description: 1-90

Event and Year: Spring 2019

Report Date: 24 Apr 19 Lab Number: 19-W596 Work Order #:82-0660 Account #: 002800

Date Sampled: 3 Apr 19 13:10 Date Received: 3 Apr 19 14:20 Sampled By: MVTL Field Services

Temp at Receipt: 6.5C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Silver - Dissolved	< 0.001 * mg/l	0.0005	6020B	18 Apr 19 14:58	CC

^{*} Holding time exceeded

Approved by:

Claudette K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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



Field Datasheet

Groundwater Assessment

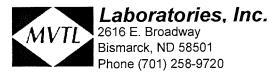
Company:	MDU Heskett	
Event:	Spring 2019	
Sample ID:	1-90	
Sampling Personal:	Daren Niels-Ras	

2010 21 21000110, 1110, 211								ournpling i	Orooriar.	MITTI	77 (-)	7	
Phone: (701) 258-9	720								*				
Weather Conditions: Temp: 40 °F Wind: 74 60 Precip: Sunny Partly Cloudy / C	udy												
,	Well Infe	ormation	•					Sa	ampling Ir	formation	on		
Well Locked?	Yes	No				Purgi	ng Method	Blac	dder				
Well Labeled?	(Yes	No				Sampli	ing Method	: Blac	dder		Co	ntrol Setting	js
Casing Straight?	Yes	No				Dedica	ted Equip?	: Yes	No		Purge:	_5	sec
Grout Seal Intact?	Yes	No	Not Vis	ible		Duplicate	Sample?:	Yes	(No		Recover:	55	sec
Repairs Necessary:	70					Duplicate	Sample ID	:			PSI:		
Casing	Diameter:		2"										
Well Information San Well Locked? Yes No Purging Method: Bladd Well Labeled? Yes No Sampling Method: Bladd Casing Straight? Yes No Dedicated Equip?: Yes Grout Seal Intact? Yes No Not Visible Repairs Necessary: Duplicate Sample?: Yes Duplicate Sample ID: Duplicate Sample ID: Yes Water Level Before Purge: 10.45 ft Depth to Top of Pump: 14.35 ft Water Level After Sample: 10.65 ft Bottle 1L Raw 500mL Not be a purging Method: Bladd Sampling Method: Bladd Dedicated Equip?: Yes Duplicate Sample: Yes Well Purge Date: A A A Well Purged Dry? Yes Sample Date: A A A Water Level After Sample: 10.65 ft Bottle 1L Raw 500mL N	919	Time Purg	ing Began:	1245	am/pm								
			7			Well P	urged Dry	Yes	No	Time P	urged Dry:		am/pm
						Sa	ample Date	: JAPR	19	Time of	Sampling:	1310	am/pm
Depth to Top	of Pump:	1	4.35	ft				<i>J</i> , / •				- ,	
Water Level Afte	er Sample:	l	0,65	ft		Bottle	1L Raw	500ml	L Nitric	500mL Nitr	ric (filtered)	250mL 9	Sulfuric
Measuremen	t Method:	Electric V	Nater Level In	dicator		List:							
			-	Field	Measure	ements							

Stabil	ization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1 12	72450	6.67	9212	6,68	0,82	-266. 1	0,80	10154	100	500	ch
2	1255	6.57	9302	6.67	0.88	-278,8	1,37	10,73	100	500	dr
3	1300	6.43	9370	6.65	0.90	-276,6	0.80	10.68	100	500	ch
4	1305	6,47	9341	114	0,87	-273,2	0184	10.65	100	500	d
5	13/0	6.51	9342	264	0,90	-77Z10	0,86	10,65	100	500	Ch
6			.5	010	,						
7											
8											
9											
10											

Stabilized: Yes\ No Comments:

Total Volume Removed: 2506 mL



Chain of Custody Record

Project Name:		Event:	Work Order Number:	82- 0660
	MDU Heskett	Spring 2019		02- 0660
Report To: Attn: Address: phone: email:	MDU Samantha Davies 5181 Southgate Dr. Billings, MT 59102 406-896-4227	Carbon Copy: Attn: Address:	Name of Sampler(s): Parven Nieswaag	

	Sam	ple Information		Bottle Type	Field Parameters	Analysis
Lab Number	Sample ID	Date	Sample Type	1 liter 500mL Nitric 500mL Nitric (filtered) 250 mL Sulfuric	Temp (°C) Spec. Cond.	Analysis Required
W Sab	1-90	3APR 19 131	O GW	$ \mathbf{x} \mathbf{x} \mathbf{x} \mathbf{x}$	6.51 9342 6.64	MDU List AA

Relinquished By:		Sample Condition:			
Name:	Date/Time	Location:	Temp (°C)		
1 Jan Nins	3APK19	Valk In #2	TM562 / TM588		
2			1026.5		

Rece	ived by:				
Name:	Date/Time				
1/6	3 Apr 19				
Nouchman1	1420				



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Amended PO# 5Nov2019 - STATE

Abbie Krebsbach Montana Dakota Utilities 400 N 4th Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2019

1 of 2 Page:

Report Date: 14 Oct 19 Lab Number: 19-W3751 Work Order #: 82-2626 Account #: 002800

Date Sampled: 18 Sep 19 10:50 Date Received: 18 Sep 19 12:50 Sampled By: MVTL Field Services

PO #: 175103

Temp at Receipt: 5.5C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	18 Sep 19	EMS
Conductivity (EC)	9662	umhos/cm	1	SM2510-B	26 Sep 19 6:45	
pH - Field	6.87	units	NA	SM 4500 H+ B	18 Sep 19 10:50	
pH - Fleid pH	* 7.5	units	0.1	SM4500 H+ B	26 Sep 19 6:45	
Temperature - Field	12.5	Degrees C	NA	SM 2550B	18 Sep 19 10:50	
Total Alkalinity	330	mg/1 CaCO3	20	SM2320-B	26 Sep 19 6:45	
Bicarbonate	330	mg/1 CaCO3	20	SM2320-B	26 Sep 19 6:45	
Carbonate	< 20	mg/l CaCO3	20	SM2320-B	26 Sep 19 6:45	
Hydroxide	< 20	mg/1 CaCO3	20	SM2320-B	26 Sep 19 6:45	
Conductivity - Field	9739	umhos/cm	1	EPA 120.1	18 Sep 19 10:50	
Tot Dis Solids (Summation)	10300	mg/l	12.5	SM1030-F	27 Sep 19 13:02	
Total Hardness as CaCO3	4860	mg/1	NA	SM2340-B	27 Sep 19 13:02	
Cation Summation	163	meg/L	NA	SM1030-F	30 Sep 19 17:31	
Anion Summation	157	meq/L	NA	SM1030-F	26 Sep 19 6:45	Calculated
Percent Error	1.79	8	NA	SM1030-F	30 Sep 19 17:31	
Sodium Adsorption Ratio	9.36		NA	USDA 20b	27 Sep 19 13:02	
Fluoride	1.10	mg/1	0.10	SM4500-F-C	26 Sep 19 6:45	
Sulfate	7120	mg/l	5.00	ASTM D516-07	25 Sep 19 9:28	
Chloride	76.6	mg/1	1.0	SM4500-C1-E	19 Sep 19 11:55	
Nitrate-Nitrite as N	6.10	mg/l	0.10	EPA 353.2	19 Sep 19 12:30	EV
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	20 Sep 19 10:20	
Mercury - Dissolved	< 0.0002	mg/1	0.0002	EPA 245.1	19 Sep 19 12:23	
Calcium - Total	447	mg/1	1.0	6010D	27 Sep 19 13:02	SZ
Magnesium - Total	910	mg/1	1.0	6010D	27 Sep 19 13:02	SZ
Sodium - Total	1500	mg/l	1.0	6010D	27 Sep 19 13:02	SZ
Potassium - Total	28.2	mg/1	1.0	6010D	27 Sep 19 13:02	
Barium - Dissolved	< 0.5 @	mg/l	0.10	6010D	30 Sep 19 17:33	
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010D	30 Sep 19 17:33	
Manganese - Dissolved	< 0.25 @	mg/l	0.05	6010D	30 Sep 19 17:33	
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D	30 Sep 19 17:31	
Boron - Dissolved	< 0.5 @	mg/1	0.10	6010D	24 Sep 19 17:54	
Arsenic - Dissolved	< 0.002	mg/1	0.0020	6020B	9 Oct 19 13:03	
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	9 Oct 19 13:03	
Chromium - Dissolved	< 0.002	mg/1	0.0020	6020B	9 Oct 19 13:03	
Lead - Dissolved	< 0.0005	mg/1	0.0005	6020B	9 Oct 19 13:0:	MDE

RL - Method Reporting Limit

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



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Amended PO# 5Nov2019 - STATE

Abbie Krebsbach Montana Dakota Utilities 400 N 4th Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2019

Page: 2 of 2

Report Date: 14 Oct 19 Lab Number: 19-W3751 Work Order #: 82-2626 Account #: 002800

Date Sampled: 18 Sep 19 10:50 Date Received: 18 Sep 19 12:50 Sampled By: MVTL Field Services

PO #: 175103

Temp at Receipt: 5.5C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Selenium - Dissolved	0.0067 mg/1	0.0050	6020B	9 Oct 19 13:03	
Silver - Dissolved	< 0.0005 mg/1	0.0005	6020B	9 Oct 19 13:03	

* Holding time exceeded

Approved by:

Clauditte K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

= Due to sample matrix = Due to sample quantity

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



Field Datasheet

Groundwater Assessment

Company:	MDU Heskett
Event:	Fall 2019
Sample ID:	1-90 ,
Sampling Personal:	Jen der er

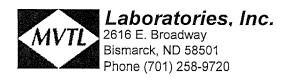
2616 E. Broadway Ave, Bis Phone: (701) 258-9		÷	ie.					Sampling P	ersonal:	-	Jeny !	leger	
Weather Conditions:		Temp:	70°F		Wind:	₩ @	<u>~</u>	(0	Precip	: Sunr	ny / Partly C	loudy / Clo	oudy
	Well Info	rmation						Sa	ampling l	nformatio	on		
Well Locked?	Yes	No				Purging I	Method:	Blac	der				
Well Labeled?	Xes >	No				Sampling I	Method:	Blac	dder		C	ntrol Setting	js
Casing Straight?	Yes	No	-			Dedicated	Equip?:	(es)	No		Purge:	5	sec.
Grout Seal Intact?	Yes	No	Not Visit	δle		Duplicate Sa	mple?:	Yes	₩		Recover:	55	sec.
Repairs Necessary:						Duplicate San	nple ID:		-		PSI:	15	
Casing	Diameter:		2"										
Water Level Befo	ore Purge:		11,22	ft		Purg	e Date:	18 Sep	H9	Time Purg	ing Began:	1025	∰/pm
						Well Purge	ed Dry?	Yes	No	Time P	urged Dry:		am/pm
						Sampl	e Date:	18 Sert	19	Time of	Sampling:	1050	Gam/pm
Depth to Top	of Pump:			ft				ι,					
Water Level Afte	er Sample:		11.42	ft		Bottle 1	L Raw	500mL	_ Nitric	500mL Nitr	ric (filtered)	250mL S	Sulfuric
Measuremen	t Method:	Electric	Water Level Ind	icator		List:							
				Field	Measure	ments			,				

Stabi	lization	Temp	Spec.		DO	ORP	Turbidity	Water	Pumping	mL	Description:
(3 cons	secutive)	(°C)	Cond.	рН	(mg/L)	(mV)	(NTU)	Level (ft)	Rate	Removed	Clarity, Color, Odor, Ect.
SEQ#	Time		±5%	±0.1	±10%	±20 mV	±10%	0.25 ft	ml/min		Clear, Slightly Turbid, Turbid
1	1030	1664	9607	6.89	2,79	123.9	1.43	11:36	100,0	500.0	Clear
2	1035	12.77	9613	690	4.74	128.9	0.82	11.42	100.0	50,0	Clear
3	1040	12,42		6.88	5.54	129.6	0.42	11.52	100:0	500.0	Cles
4	1045	12.42	9692	6,88	5.67	130.1	0.49	11,48	100,0	5000	Cles
5	1050	12.54	9739	6.87	5.45	130.4	0,50	11,41	100.0	500:0	Cle
6											
7											
8											
9											
10											

Stabilized: Yes

No

Total Volume Removed: 2500,0 mL



Chain of Custody Record

Project Name	9;	Event:	Work Order Number:	00
	MDU Heskett	Fall 2019		82-2626
Report To: Attn: Address: phone: email:	MDU Abbie Krebsbach 400 N. 4th St. Bismarck, ND 58501 701-222-7844	Carbon Copy: Attn: Address:	Name of Sampler(s):	

	Sam	ple Information	on			E	ottl	е Тур	Эе	F	ield Para	ameters	Analysis
Lab Number	Sample ID	Date	Time	Sample Type	¹ liter	1 ~	<u> </u>	, , ,		Temp (°C)	Spec. C	Hd	Analysis Required
W3751	1-90	185ept 19	1050	GW	 Х	Х	X	x		12.54	9739	6.87	MDU List AA
	•	C											

Relinquished By:	Sample Condition:					
Name/./	Date/Time	Location:	Temp (°C)			
10 1714	18 Sey +19 1250	Walk In #2	Rol 5,5 (TM\$62/TM805			
2 , , ,						

Receive	ed by:
Ņame:	Date/Time
-1ma/20-	18Sept 2019
	1,450

Claudette Carroll

From:

Peterson, Todd <Todd,Peterson@mdu.com>

Sent:

Friday, November 1, 2019 10:32 AM

To:

Claudette Carroll

Cc:

Dihle, Mark

Subject:

RE: Lab invoice and report

Attachments:

201982-2626 MDU ND.pdf; 201982-2611 MDU CCR.pdf

Claudette,

These lab analyses should both have the PO 175103 listed on them. I have the paper copies and can revise them on my end, but can you change the PO number on your copies and resend the corrected PDF analyses.

Thank you!

Todd.

From: Claudette Carroll < ccarroll@mvtl.com>
Sent: Thursday, October 31, 2019 1:29 PM
To: Dihle, Mark < Mark.Dihle@mdu.com>

Cc: Peterson, Todd <Todd.Peterson@mdu.com>

Subject: RE: Lab invoice and report

** WARNING: EXTERNAL SENDER. NEVER click links or open attachments without positive sender verification of purpose. DO NOT provide your user ID or password on sites or forms linked from this email. **

Hi Mark,

Looks like the work was done at MDU Heskett. Attached are the data packages. Let me know if we need to rebill/reinvoice with the correct PO.

Happy Halloween to you as well! Claudette



Minnesota Valley Testing Laboratories, Inc.

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ccarroll@mvtl.com

701-258-9720

2616 E. Broadway Ave/Bismarck, ND 58501

From: Dihle, Mark < Mark.Dihle@mdu.com > Sent: Thursday, October 31, 2019 8:46 AM
To: Claudette Carroll < ccarroll@mvtl.com > Cc: Peterson, Todd < Todd.Peterson@mdu.com >

Subject: Lab invoice and report

Good Morning!

Todd and I are trying to figure out this invoice, it appears to have the wrong PO attached to it. Please send along the analysis that the invoice is associated with and have a Happy Halloween!

Thanks!

Mark Dihle
Sr. Environmental Scientist
Montana Dakota Utilities
400 North Fourth Street
Bismarck, ND 58501-4092
Bus: 701.222.7865
Fax: 701.222.7845



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Page: 1 of 2

Quality Control Report – Amended 7 Nov 19

Lab ID: 19-W3751 Project: MDU Heskett

Work Order: 201982-2626

Eab 1D: 17- W 3 / 3 1		,	oject. Mi	JO IICSKI	- CLL		Work Order: 201982-2626										
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
Arsenic - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	19W3762q 19W3763q	< 0.002 < 0.002	0.1162 0.1123	116 112	75-125 75-125	0.1162 0.1123	0.1052 0.1149	105 115	9.9	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	102	80-120	1.00	19W3756q	< 0.1	1.04	104	75-125	1.04	0.97	97	7.0	20		<u>.</u>	< 0.1
Boron - Dissolved mg/l	0.40	90	80-120	0.400	19-W3756	< 0.1	0.38	95	75-125	0.38	0.39	98	2.6	20			< 0.1
Cadmium - Dissolved mg/l	0.0160	101	80-120	0.100 0.100	19W3762q 19W3763q	< 0.0005 < 0.0005	0.1048 0.1066	105 107	75-125 75-125	0.1048 0.1066	0.0954 0.1080	95 108	9.4 1.3	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	114	80-120	100	19W3816q	130	229	99	75-125	229	229	99	0.0	20	-	-	< 1 < 1
Chloride mg/l	30.0	91	80-120	30.0	19-W3771	28.0	56.1	94	80-120	56.1	56.5	95	0.7	20	-	_	< 1
Chromium - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	19W3762q 19W3763q	< 0.002 < 0.002	0.0989 0.0977	99 98	75-125 75-125	0.0989 0.0977	0.0884 0.0973	88 97	11.2 0.4	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	3832 7027	3834 7046	-	0.1 0.3	20 20	-	-	-
Fluoride mg/l	0.50	102	90-110	0.500	19-W3744	0.12	0.63	102	80-120	0.63	0.63	102	0.0	20	-	-	< 0.1 < 0.1
Iron - Dissolved mg/l	0.40	105	80-120	1.00	19W3756q	< 0.1	1.00	100	75-125	1.00	0.95	95	5.1	20	-	-	< 0.1
Lead - Dissolved mg/l	0.0160	101	80-120	0.100 0.100	19W3762q 19W3763q	< 0.0005 0.0030	0.0944 0.1043	94 101	75-125 75-125	0.0944 0.1043	0.0900 0.1049	90 102	4.8 0.6	20 20	_	-	< 0.0005
Magnesium - Total mg/l	20.0	112	80-120	100	19W3816q	44.1	148	104	75-125	148	148	104	0.0	20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	108	80-120	1.00	19W3756q	0.93	1.92	99	75-125	1.92	1.86	93	3.2	20	_	_	< 0.05
Mercury - Dissolved mg/l	0.0020	100	85-115	0.002	19-W3751	< 0.0002	0.0020	100	70-130	0.0020	0.0018	90	10.5	20	_	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	100	80-120	1.00	19W3756q	< 0.1	1.00	100	75-125	1.00	0.95	95	5.1	20	-	-	< 0.1
Nitrate-Nitrite as N mg/l	0.50	96	90-110	10.0	19-W3751	6.10	17.4	113	90-110	17.4	17.6	115	1.1	20	_	_	< 0.1
pH units	-	_	-	-	-	-	-	-	-	7.5 7.5	7.5 7.5	-	0.0	20 20	-	-	-



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Page: 2 of 2

Quality Control Report – Amended 7 Nov 19

Lab ID: 19-W3751 Project: MDU Heskett

Work Order: 201982-2626

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
Phosphorus as P - Total mg/l	0.50	100	90-110	1.00 1.00	19-W3745 19-W3749	< 0.1 < 0.1	0.96 1.01	96 101	90-110 90-110	0.96 1.01	0.94 0.98	94 98	2.1 3.0	20 20	-	-	< 0.1
Potassium - Total mg/l	10.0	100	80-120	20.0	19W3816q	4.8	26.0	106	75-125	26.0	26.2	107	0.8	20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	97	80-120	0.100 0.100	19W3762q 19W3763q	< 0.005 < 0.005	0.1288 0.1323	129 132	75-125 75-125	0.1288 0.1323	0.1170 0.1272	117 127	9.6 3.9	20 20	-	-	< 0.005
Silver - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	19W3762q 19W3763q	< 0.0005 < 0.0005	0.0998 0.1090	100 109	75-125 75-125	0.0998 0.1090	0.0936 0.1090	94 109	6.4 0.0	20 20	-	-	< 0.000
Sodium - Total mg/l	20.0	104	80-120	100	19W3816q	129	220	91	75-125	220	218	89	0.9	20	<u>-</u>	-	< 1 < 1
Sulfate mg/l	100	100	80-120	100	19-W3750	< 5	107	107	80-120	107	108	108	0.9	20	-	-	< 5
Total Alkalinity mg/l CaCO3	410	95	90-110	410	19-W3743	453	827	91	80-120	827	827	91	0.0	20	92	80-120	< 20 < 20

Samples were received in good condition on 18 Sep 2019 at 1250.

Temperature upon receipt at the Bismarck laboratory was 5.5°C. Samples were received on ice and evidence of cooling had begun.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- The recoveries for one nitrate matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- The recoveries for one selenium matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. Data was accepted based on acceptable recovery of the LCS. No further action was taken.
- 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.

Reporting

Per email from Todd Peterson, MDU, sample data package was amended to revise Purchase Order number on reports.

ripproved by.	Approved by:	C . (Canto
	Approved by:	C. (anto



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St Bismarck ND 58501

Project Name: MDU Heskett Active Ash

Sample Description: 1-90

Event and Year: Spring 2020

1 of 2 Page:

Report Date: 23 Apr 20 Lab Number: 20-W567 Work Order #: 82-0755 Account #: 002800

Date Sampled: 1 Apr 20 13:28 Date Received: 2 Apr 20 10:20 Sampled By: MVTL Field Services

Temp at Receipt: 5.3C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	2 Apr 20	HT
Conductivity (EC)	8765	umhos/cm	1	SM2510-B	2 Apr 20 17:00	HT
pH - Field	6.83	units	NA	SM 4500 H+ B	1 Apr 20 13:28	
	* 7.3	units	0.1	SM4500 H+ B	2 Apr 20 17:00	
pH	5.35	Degrees C	NA	SM 2550B	1 Apr 20 13:28	JSM
Temperature - Field	370	mg/1 CaCO3	20	SM2320-B	2 Apr 20 17:00	HT
Total Alkalinity	370	mg/l CaCO3	20	SM2320-B	2 Apr 20 17:00	HT
Bicarbonate	< 20	mg/l CaCO3	20	SM2320-B	2 Apr 20 17:00	HT
Carbonate	< 20	mg/1 CaCO3	20	SM2320-B	2 Apr 20 17:00	HT
Hydroxide	10111	umhos/cm	1	EPA 120.1	1 Apr 20 13:28	
Conductivity - Field	11000	mg/1	12.5	SM1030-F	9 Apr 20 10:21	
Tot Dis Solids (Summation)		mg/1	NA.	SM2340-B	3 Apr 20 15:55	
Total Hardness as CaCO3	4900	meg/L	NA	SM1030-F	6 Apr 20 11:14	
Cation Summation	166		NA	SM1030-F	9 Apr 20 10:21	
Anion Summation	171	meq/L	NA	SM1030-F	9 Apr 20 10:21	
Percent Error	-1.27	*	NA	USDA 20b	3 Apr 20 15:55	Calculated
Sodium Adsorption Ratio	9.70	C. A. / 1	0.10	SM4500-F-C	2 Apr 20 17:00	
Fluoride	1.03	mg/l	5.00	ASTM D516-11	8 Apr 20 9:38	
Sulfate	7720	mg/l	1.0	SM4500-C1-E	6 Apr 20 8:53	
Chloride	75.4	mg/l		EPA 353.2	9 Apr 20 10:21	
Nitrate-Nitrite as N	6,80	mg/l	0.10	EPA 365.1	10 Apr 20 8:49	1. 11.1.1.11
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 245.1	13 Apr 20 14:42	
Mercury - Dissolved	< 0.0002	mg/l	0.0002		3 Apr 20 15:55	1,100
Calcium - Total	421	mg/l	1.0	6010D	3 Apr 20 15:55	
Magnesium - Total	935	mg/1	1.0	6010D	3 Apr 20 15:55	
Sodium - Total	1560	mg/1	1.0	6010D	3 Apr 20 15:55	
Potassium - Total	25.2	mg/l	1.0	6010D	6 Apr 20 11:14	
Barium - Dissolved	< 0.5 @	mg/l	0.10	6010D	6 Apr 20 11:14	
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010D		
Manganese - Dissolved	< 0.25 @	mg/l	0.05	6010D	6 Apr 20 11:14	170 T.
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D	6 Apr 20 11:10	
Boron - Dissolved	< 0.5 @	mg/1	0,10	6010D	8 Apr 20 13:23	
Arsenic - Dissolved	< 0.004 +	mg/l	0.0020	6020B	23 Apr 20 10:18	
Cadmium - Dissolved	< 0.001 +	mg/l	0.0005	6020B	23 Apr 20 10:11	
Chromium - Dissolved	< 0.004 +	mg/1	0.0020	6020B	23 Apr 20 10:10	V
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	23 Apr 20 10:11	3 CC
Selenium - Dissolved	< 0.01 +	mg/l	0.0050	6020B	23 Apr 20 10:1	G CC

RL - Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below: \emptyset = Due to sample matrix \emptyset = Due to complete the property of the pr

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



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Page: 2 of 2

CERTIFICATE of ANALYSIS - STATE

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett Active Ash

Sample Description: 1-90

Event and Year: Spring 2020

Report Date: 23 Apr 20 Lab Number: 20-W567 Work Order #: 82-0755 Account #: 002800

Date Sampled: 1 Apr 20 13:28 Date Received: 2 Apr 20 10:20 Sampled By: MVTL Field Services

Temp at Receipt: 5.3C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Silver - Dissolved	< 0.001 + mg/1	0.0005	6020B	23 Apr 20 10:18	CC

* Holding time exceeded

Approved by:

Claudette K. Canto

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

The reporting limit was elevated for any analyte requiring a dilution as coded below: s = Due to sample matrix H = Due to co t = Due to sample quantity t = Due to in

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



Chain of Custody Record

Project Nam	e:	Event:	Work Order Number:	
	MDU Heskett	Spring 2020	82-0755	
Report To: Attn: Address: Phone: Email:	Montana-Dakota Utilities Todd Peterson 400 North 4th St. Bismarck, ND 58501 701-425-2427 todd.peterson@mdu.com	CC:	Collected By:	

Lab Number	Sample ID	Police	^{Tim} e	Somon	III NO	Solfer Ray	20 m /m	\$ \\ \ \ \ \ \ \ \ \ \ \ \ \	1/11/2/11/2/11/2/11/2/2/2/2/2/2/2/2/2/2	Jeno Co Jeno Jeno Jeno Jeno Jeno Jeno Jeno Jen	Spec	j. / 10	Analysis Required
N507	1-90	1 Agr 2020	1328	GW	Х		Х	Х		5,35	10111	6.83	
						T.							MDU List AA

Relinquished By		Sample	Condition	Rece	ived By
, Name	Date/Time	Location	Temp (°C)	Name	Date/Time
	2 Apr 2020	Log In Walk In #2	Pol 5.3 TM562/(M803)	Gily Idam	a Aprava 1020
2				5	

MVTL

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Page: 1 of 2

Quality Control Report Lab ID: 20-W567

ab ID: 20-W567 Project: MDU Heskett Active Ash Work Order: 202082-0755

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
Arsenic - Dissolved mg/l	0.1000	98	80-120	0.100 0.100	20W719q 20W718q	0.0050 < 0.002	0.1030 0.1045	98 104	75-125 75-125	0.1030 0.1045	0.1084 0.1020	103 102	5.1 2.4	20 20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	108	80-120	1.00	20W565q	< 0.1	1.01	101	75-125	1.01	1.02	102	1.0	20	-	-	< 0.1
Boron - Dissolved mg/l	0.40 0.40	100 102	80-120 80-120	2.00	20-W575	0.79	2.42	82	75-125	2.42	2.46	84	1.6	20	1		< 0.1
Cadmium - Dissolved mg/l	0.1000	103	80-120	0.100 0.100	20W719q 20W718q	< 0.0005 < 0.0005	0.0884 0.0928	88 93	75-125 75-125	0.0884 0.0928	0.0940 0.0917	94 92	6.1 1.2	20 20	-	-	< 0.0005
Calcium - Total mg/l	20.0	117	80-120	500	20W566q	477	960	97	75-125	960	970	99	1.0	20		-	< 1 < 1
Chloride mg/l	30.0 30.0	91 91	80-120 80-120	30.0	20-W570	25.6	55.2	99	80-120	55.2	54.8	97	0.7	20	-	-	< 1 < 1
Chromium - Dissolved mg/l	0.1000	99	80-120	0.100 0.100	20W719q 20W718q	< 0.002 < 0.002	0.1056 0.1040	106 104	75-125 75-125	0.1056 0.1040	0.1117 0.1022	112 102	5.6 1.7	20 20	-	-	< 0.002
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	1482 4529	1474 4494	-	0.5 0.8	20 20	-	-	-
Fluoride mg/l	0.50	106	90-110	0.500	20-W566	0.98	1.38	80	80-120	1.38	1.41	86	2.2	20	-	-	< 0.1
Iron - Dissolved mg/l	0.40	108	80-120	1.00	20W565q	< 0.1	0.97	97	75-125	0.97	0.97	97	0.0	20	-	-	< 0.1
Lead - Dissolved mg/l	0.1000	97	80-120	0.100 0.100	20W719q 20W718q	0.0019 < 0.0005	0.0844 0.0834	82 83	75-125 75-125	0.0844 0.0834	0.0868 0.0835	85 84	2.8 0.1	20 20	-	-	< 0.0005
Magnesium - Total mg/l	20.0	116	80-120	500	20W566q	740	1190	90	75-125	1190	1210	94	1.7	20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	110	80-120	1.00	20W565q	< 0.05	0.94	94	75-125	0.94	0.94	94	0.0	20	-	-	< 0.05
Mercury - Dissolved mg/l	0.0020	85	85-115	0.002	20-W563	< 0.0002	0.0016	80	70-130	0.0016	0.0016	80	0.0	20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	105	80-120	1.00	20W565q	< 0.1	0.93	93	75-125	0.93	0.94	94	1.1	20	-	-	< 0.1
Nitrate-Nitrite as N mg/l	0.50	108	90-110	1.00	20-W578	< 0.1	1.02	102	90-110	1.02	1.02	102	0.0	20	-	-	< 0.1
pH units	-	-	-	-	-	-	-	1	-	8.4 7.1	8.4 7.2	-	0.0	20 20	-	-	-



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Quality Control Report

Lab ID: 20-W567 Project: MDU Heskett Active Ash Work Order: 202082-0755

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
Phosphorus as P - Total mg/l	0.50	106	90-110	1.00 1.00	20-M695 20-W575	< 0.1 < 0.1	1.05 0.97	105 97	90-110 90-110	1.05 0.97	1.06 0.98	106 98	0.9 1.0	20 20	-	-	< 0.1
Potassium - Total mg/l	10.0	113	80-120	100	20W566q	26.3	127	101	75-125	127	131	105	3.1	20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.1000	97	80-120	0.100 0.100	20W719q 20W718q	< 0.005 < 0.005	0.0859 0.0934	86 93	75-125 75-125	0.0859 0.0934	0.0893 0.0931	89 93	3.9 0.3	20 20	-	-	< 0.005
Silver - Dissolved mg/l	0.1000	107	80-120	0.100 0.100	20W719q 20W718q	< 0.0005 < 0.0005	0.0914 0.0940	91 94	75-125 75-125	1	0.0990 0.0938	99 94	8.0 0.2	20 20	-	-	< 0.0005
Sodium - Total mg/l	20.0	116	80-120	500	20W566q	800	1250	90	75-125	1250	1260	92	0.8	20	-	-	< 1 < 1
Sulfate mg/l	100	97	80-120	100	20-W578	< 5	99.0	99	80-120	99.0	99.2	99	0.2	20	-	-	< 5
Total Alkalinity mg/l CaCO3	410	97	90-110	410 410	20-D995 20-W564	807 454	1160 797	86 84	80-120 80-120	1160 797	1148 796	83 83	1.0 0.1	20 20	93	80-120	< 20 < 20
Total Suspended Solids mg/l	-	-	-	-	-	-	-	-	-	312 49	306 53	-	1.9 7.8	20 20	- -	-	< 2

Samples were received in good condition on 2 Apr 2020 at 1020.

Temperature upon receipt at the Bismarck laboratory was 5.3°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- For some analytes, the reported results were elevated due to matrix effect on the response of the internal standard.

Approved by: C. GNJO

29 Agr 2020



Temp:

NO

WELL INFORMATION

YES

Field Datasheet

Groundwater Assessment

Wind:

40 °F

Company:	MDU Heskett
Event:	Spring 2020
Sample ID:	1-90
Sampling Personal:	Jen the

Precip:

SAMPLING INFORMATION

Sunny / Partly Cloudy / Cloudy

Purge:

Control Settings:

Sec.

Phone: (701) 258-9720

Weather Conditions:

Well Locked?

Well Labeled?	YES?	NO]	Sampling N		Bladder		1	Purge: 3	Sec.
Casing Strait?	(YES)	NO				Dedicated	Equipment?	(YES)	NO	_	Recover: 27	Sec.
Grout Seal Intact?	YES	NO	Not \	/isible						-	PSI: / 7	
Repairs Necessary?						Duplicate S		YES	(NO)	1		
	g Diameter:		2"			Duplicate S	Sample ID:		_	_		
Water Level Bo	efore Purge:	10,	70	ft						-		
Total De	pth of Well:	:	_	ft			Bottl	e List:		_		
V	Vell Volume:	-		liters		1 Liter Raw						
Depth to T	op of Pump:	-		ft		500mL Nitrio	C					
Water Level A	fter Sample:		7.91	ft]	500mL Nitrio	c (filtered)					
Measureme	ent Method	Electric	Water Level	Indicator		250mL Sulfu	ric			_		
					- FIEI	LD READII	NGS					
Stabilization Parar	meters	Temp.	Spec.	T	DO	ORP	Turbidity		Pumping	-Liters	Appearance or C	omment
(3 Consecutiv		(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	-Liters Removed	Clarity, Color, O	dor, Ect.
Purge Date	Time	-±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turk	oid, turbid
	1308	Start of Wel	ll Purge	<u> </u>	L							
(Apr 2020	1313	5.21	9706	6,86	9.16	112.4	4,00	10.76	100.0	500.0	Cles	
	1318	5.56	10132	6.83	8,35	131.5	3.07	10.90	100,0	500.0	Clean	
	1323	5.46	10119	6,82	8,55	135.8	7.98	10,85	190.0	500.0	Clean	
	1328	5.35	10111	6,83	8.22	140.6	2.84	10.90	100.0	500.0	Cler	
			1									

		1										
				1								
	Well St	tabilized?	YÈS	NO	•			Total Vo	ume Purged	: <u>5000.0</u>	Liters mc	
Camanla Data	Time	Temp.	Spec.	, pH			Turbidity				Appearance or 0	
Sample Date	Time	(°C)	Cond.	. рн			(NTU)				Clarity, Color, O	dor, Ect.
Ar 2020	1328	5,35	10111	6.83			2.84				Cles	
Comments:	T											
Comments.												

N @

Purging Method:

570

Bladder



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2020

1 of 2 Page:

Report Date: 28 Sep 20 Lab Number: 20-W3477 Work Order #: 82-2545 Account #: 002800

Date Sampled: 14 Sep 20 13:13 Date Received: 14 Sep 20 15:35 Sampled By: MVTL Field Services

PO #: 180609 OP

Temp at Receipt: 5.8C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	14 Sep 20	CC
Total Suspended Solids	8	mg/1	2	USGS 13765-85	15 Sep 20 8:50	CC
Conductivity (EC)	10365	umhos/cm	1	SM2510B-11	14 Sep 20 17:00	CC
pH - Field	6.80	units	NA	SM 4500 H+ B	14 Sep 20 13:13	DJN
Н	* 6.9	units	0.1	SM4500-H+-B-11	14 Sep 20 17:00	CC
Temperature - Field	12.6	Degrees C	NA	SM 2550B	14 Sep 20 13:13	DJN
Total Alkalinity	458	mg/l CaCO3	20	SM2320B-11	14 Sep 20 17:00	CC
Bicarbonate	458	mg/l CaCO3	20	SM2320B-11	14 Sep 20 17:00	CC
Carbonate	< 20	mg/1 CaCO3	20	SM2320B-11	14 Sep 20 17:00	CC
Hydroxide	< 20	mg/1 CaCO3	20	SM2320B-11	14 Sep 20 17:00	CC
Conductivity - Field	10466	umhos/cm	1	EPA 120.1	14 Sep 20 13:13	DJN
Tot Dis Solids (Summation)	11200	mg/l	12.5	SM1030-F	18 Sep 20 10:17	Calculated
Total Hardness as CaCO3	4810	mg/1	NA	SM2340B-11	18 Sep 20 10:17	Calculated
Cation Summation	166	meg/L	NA	SM1030-F	18 Sep 20 10:17	Calculated
Anion Summation	176	meq/L	NA	SM1030-F	17 Sep 20 9:18	Calculated
Percent Error	-2.89	8	NA	SM1030-F	18 Sep 20 10:17	Calculated
Sodium Adsorption Ratio	10.0		NA	USDA 20b	18 Sep 20 10:17	Calculated
Fluoride	1.08	mg/l	0.10	SM4500-F-C	14 Sep 20 17:00	CC
Sulfate	7880	mg/l	5.00	ASTM D516-11	16 Sep 20 10:03	EV
Chloride	89.9	mg/1	1.0	SM4500-C1-E-11	16 Sep 20 11:10	EV
Nitrate-Nitrite as N	6.70	mg/l	0.10	EPA 353.2	17 Sep 20 9:18	EV
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	18 Sep 20 7:54	EMS
Mercury - Dissolved	< 0.0002	mg/l	0.0002	EPA 245.1	18 Sep 20 16:11	MDE
Calcium - Total	408	mg/l	1.0	6010D	18 Sep 20 10:17	MDE
Magnesium - Total	920	mg/l	1.0	6010D	18 Sep 20 10:17	MDE
Sodium - Total	1600	mg/1	1.0	6010D	18 Sep 20 10:17	MDE
Potassium - Total	25.5	mg/1	1.0	6010D	18 Sep 20 10:17	MDE
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010D	15 Sep 20 11:55	MDE
Manganese - Dissolved	< 0.25 @	mg/l	0.05	6010D	15 Sep 20 11:55	MDE
Boron - Dissolved	< 0.5 @	mg/l	0.10	6010D	17 Sep 20 10:54	MDE
Arsenic - Dissolved	< 0.004 +	mg/l	0.0020	6020B	24 Sep 20 12:46	MDE
Cadmium - Dissolved	< 0.0005	mg/1	0.0005	6020B	24 Sep 20 12:46	MDE
Chromium - Dissolved	< 0.004 +	mg/l	0.0020	6020B	24 Sep 20 12:46	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	24 Sep 20 12:46	MDE
Selenium - Dissolved	< 0.01 +	mg/l	0.0050	6020B	24 Sep 20 12:46	MDE

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 internal standard response



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CERTIFICATE of ANALYSIS - STATE

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: 1-90

Event and Year: Fall 2020

Page: 2 of 2

Report Date: 28 Sep 20 Lab Number: 20-W3477 Work Order #: 82-2545 Account #: 002800

Date Sampled: 14 Sep 20 13:13 Date Received: 14 Sep 20 15:35 Sampled By: MVTL Field Services

PO #: 180609 OP

Temp at Receipt: 5.8C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Silver - Dissolved	< 0.0005 mg/l	0.0005	6020B	24 Sep 20 12:46	MDE

* Holding time exceeded

Approved by:

Claudite K Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

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



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Quality Control Report

Lab ID: 20-W3477 Project: MDU Heskett Work Order: 202082-2545

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
Arsenic - Dissolved mg/l	0.0160	103	80-120	0.200 0.200	20-W3477 20-W3477Q	< 0.004 < 0.004	0.2072 0.2072	104 104	75-125 75-125	0.2072	0.2014	101	2.8	20	-	-	< 0.002
Barium - Dissolved mg/l	0.40	110	80-120	5.00	20W3477q	< 0.5	4.70	94	75-125	4.70	4.86	97	3.3	20	-	-	< 0.1 < 0.1
Boron - Dissolved mg/l	0.40	100	80-120	2.00	20-W3492	0.70	2.36	83	75-125	2.36	2.36	83	0.0	20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	102	80-120	0.100	20-W3477	< 0.0005	0.0821	82	75-125	0.0821	0.0871	87	5.9	20	-	-	< 0.0005
Calcium - Total mg/l	20.0	112	80-120	500 500	20M1686q 20W3472q	258 458	745 985	97 105	75-125 75-125	745 985	750 985	98 105	0.7 0.0	20 20	-	_	< 1 < 1
Chloride mg/l	30.0 30.0	98 101	80-120 80-120	30.0	20-W3481	4.4	36.4	107	80-120	36.4	36.5	107	0.3	20	-	-	< 1 < 1
Chromium - Dissolved mg/l	0.0160	101	80-120	0.200 0.200	20-W3477 20-W3477Q	< 0.004 < 0.004	0.1990 0.1990	100 100	75-125 75-125	0.1990	0.1902	95	4.5	20		_	< 0.002
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	4608	4579	-	0.6	20	-		-
Fluoride mg/l	0.50 0.50	102 104	90-110 90-110	0.500	20-W3474	0.13	0.61	96	80-120	0.61	0.62	98	1.6	20			< 0.1 < 0.1
Iron - Dissolved mg/l	0.40	110	80-120	5.00	20W3477q	< 0.5	5.15	103	75-125	5.15	5.20	104	1.0	20	-	- 1	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	101	80-120	0.100	20-W3477	< 0.0005	0.0834	83	75-125	0.0834	0.0881	88	5.5	20	-	1	< 0.0005
Magnesium - Total mg/l	20.0	108	80-120	500 500	20M1686q 20W3472q	< 5 398	510 890	102 98	75-125 75-125	510 890	515 895	103 99	1.0 0.6	20 20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	112	80-120	5.00	20W3477q	< 0.25	5.20	104	75-125	5.20	5.25	105	1.0	20	-	<u>-</u> -	< 0.05 < 0.05
Mercury - Dissolved mg/l	0.0020	95	85-115	0.002 0.002	20-W3495 a44705q	< 0.0002 < 0.0002	0.0019 0.0020	95 100	70-130 70-130	0.0019 0.0020	0.0019 0.0018	95 90	0.0 10.5	20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	105	80-120	5.00	20W3477q	< 0.5	5.10	102	75-125	5.10	5.15	103	1.0	20	-	<u>-</u>	< 0.1 < 0.1



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Quality Control Report

Lab ID: 20-W3477 Project: MDU Heskett Work Order: 202082-2545

Lab 10. 20- W34//		1.1	Oject. Wil	O HOSK			VUIK OI	uci. 202	002-234	,							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Nitrate-Nitrite as N mg/l	0.50	98	90-110	1.00	20-W3444	0.21	1.09	88	90-110	1.09	1.10	89	0.9	20	130	-	< 0.1
pH units	(Q)	J-sar T	(12 - %	-0	-	3	6			6.8	6.8	97	0.0	20	34	1	12
Phosphorus as P - Total mg/l	0.50	106	90-110	1.00 1.00	20-D2914 20-D2977	2.94 < 0.1	3.96 1.04	102 104	90-110 90-110	3.96 1.04	4.01 1.05	107 105	1.3 1.0	20 20		1	< 0.1
Potassium - Total mg/l	10.0	106	80-120	100 100	20M1686q 20W3472q	36.6 20.4	138 126	101 106	75-125 75-125	138 126	140 126	103 106	1.4	20 20		4	<1 <1
Selenium - Dissolved mg/l	0.0160	100	80-120	0.200 0.200	20-W3477 20-W3477Q	< 0.01 < 0.01	0.2217 0.2217	111 111	75-125 75-125	0.2217	0.2055	103	7.6	20			< 0.005
Silver - Dissolved mg/l	0.0160	104	80-120	0.100	20-W3477	< 0.0005	0.0788	79	75-125	0.0788	0.0839	84	6.3	20	H	A-harmi	< 0.0002
Sodium - Total mg/l	20.0	108	80-120	500 500	20M1686q 20W3472q	525 328	985 810	92 96	75-125 75-125	985 810	1000 810	95 96	1.5 0.0	20 20	4.4		<1 <1
Sulfate mg/l	100	96	80-120	500	20-W3480	561	1000	88	80-120	1000	974	83	2.6	20	9	1.	< 5
Total Alkalinity mg/l CaCO3	410 410	98 97	90-110 90-110	410	20-W3477	458	760	74	80-120	760	743	70	2,3	20	95	80-120	< 20 < 20
Total Suspended Solids mg/l	100		1.2	1,4,7 E		-	-	140	Let I	9	10	(5.11	10.5	*		3-11-11	< 2

^{*} Data reported based on acceptance criteria of Absolute Difference of \pm 3 mg/L.

Samples were received in good condition on 14 Sep 2020 at 1535.

Temperature upon receipt at the Bismarck laboratory was 5.8°C. Samples were received on ice and evidence of cooling had begun.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here.

- · For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- For some analytes, the reported results were elevated due to matrix effect on the response of the internal standard.
- The recoveries for one alkalinity matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. LCS was acceptable. No further action was taken.
- The recoveries for one nitrate matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. LCS was acceptable. No further action was taken.

Approved by:	C-CANTO
	DOCT 20 20



Field Datasheet

Groundwater Assessment

Wind:

Company:	MDU Heskett	
Event:	Fall 2020	
Sample ID:	1-90	

Partly Cloudy / Cloudy

Sampling Personal: /

Precip:

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

Temp:

Weather Conditions:

										FORMAT4		
Well Locked?	YES	NO				Purging Me	thod:	Bladder]	Control Setting	gs:
Well Labeled?	YES'	NO				Sampling M	ethod:	Bladder]	Purge: 2	Sec.
Casing Strait?	YES	NO				Dedicated E	quipment?	(YES)	NO]	Recover: 88	Sec.
Grout Seal Intact?	(YES)	NO	Not	isible)						_	PSI:	
Repairs Necessary?						Duplicate Sa	ample?	YES	(NO)]		
	g Diameter:	2				Duplicate Sa	ample ID:					
Water Level B	efore Purge:	12.		ft						_		
	pth of Well:			ft		·	Bottl	e List:				
	/ell Volume:			liters		1 Liter Raw						
<u></u>	op of Pump:			ft		500mL Nitric						
Water Level A	fter Sample:	12		ft		500mL Nitric	(filtered)					
Measureme	ent Method:	Electric V	Water Level	Indicator		250mL Sulfur	ic]		
					FIEL	LD READIN	IGS					
Stabilization Parar	meters	Temp.	Spec.		DO	ORP	Turbidity	347-41	Pumping	th Liters	Appearance or Con	nment
(3 Consecutiv	e)	(°C)	Cond.	pН	(mg/L)	(mV)	(NTU)	Water Level	Rate	Removed	Clarity, Color, Odo	r, Ect.
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min		clear, slightly turbid,	turbid
	1238	Start of Well		_	1							
JSept 2020	1243	12.80	10404	6,79	1,80	27466	1.23	12,40	100	500	an	
1 000	1258	1261	10439	6,80	1,72	760,4	058	12,28	100	1500	4	
1	1303	12,52	10446	160	1,73	256,8	0051	1228	100	500	a	
(00)	1308	12161	10437	6000	1.64	254,8	6.58	12:31	100	500		
1,150	1213	12156	10466	Lax 0	1,72	247,7	0.76	12.36	100	500	Chu	
1/20	19.5	t -	,				· ·			<u> </u>		
'												
	l				1							
	Well Sta	ibilized?	YES	NO				Total Vol	ume Purged:	3.500	Liters -	
Sample Date	Time	Temp.	Spec.	рΗ			Turbidity				Appearance or Con	
		(°C)	Cond.	1 11-			(NTU)				Clarity, Color, Odo	r, Ect.
145est 2020	1313	12.36	10466	6180			0:t6					
Comments:												



Chain of Custody Record

Project Name:		Event:	Work Order Number:	
	MDU Heskett	Fall 2020	82-2545	
Report To: Attn: Address: Phone: Email:	Montana-Dakota Utilities Todd Peterson 400 North 4th St. Bismarck, ND 58501 701-425-2427 todd peterson@mdu.com	CC:	Collected By: Dadlen Nicswaag	-

Lab Number	Sample ID	Oote	lime	Some	11/200 INDO	Solfer Ray	500 Mir.	250 Miles	THE SHEET OF THE PROPERTY OF T		io. Ha	Analysis Required
NOTE	1-90	145ept2020	1313	GW	х	X	Х	х	12.56	10466	6.80	
					\Box		-	1				MDU List AA

Relinquished By	Relinquished By			Received By				
Name	Date/Time	Location	Temp (°C)	Name	Date/Time			
12 .1:	14Sept 2020	(log ln)			14 Sept 2020			
4000	1535	Walk In #2	TM562 / TM805		1535			
			ROTES					
			1					



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APP III

Page: 1 of 1

CERTIFICATE of ANALYSIS - CCR

Todd Peterson Montana-Dakota Utilities Co.

400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: MW1-90

Event and Year: Spring 2021

Report Date: 31 Mar 21 Lab Number: 21-W501 Work Order #: 82-0597 Account #: 002800

Date Sampled: 23 Mar 21 9:29 Date Received: 23 Mar 21 14:00 Sampled By: MVTL Field Services

PO #: 185968 OP

Temp at Receipt: 3.6C ROI

	As Receiv Result	red	Method RL	Method Reference	Date Analyzed		Analyst
pH - Field	6.89	units	NA	SM 4500 H+ B	23 Mar 21	9:29	DJN
pH	* 7.1	units	0.1	SM4500-H+-B-11	23 Mar 21 1	7:00	RAA
Temperature - Field	6.26	Degrees C	NA	SM 2550B	23 Mar 21	9:29	DJN
Conductivity - Field	10530	umhos/cm	1	EPA 120.1	23 Mar 21	9:29	DJN
Fluoride	1.03	mg/1	0.10	SM4500-F-C	23 Mar 21 1	17:00	RAA
Sulfate	7030	mg/l	5.00	ASTM D516-11	24 Mar 21 1	10:47	SD
Chloride	82.7	mg/l	2.0	SM4500-C1-E-11	24 Mar 21	8:47	SD
Total Dissolved Solids	12200	mg/l	10	USGS I1750-85	25 Mar 21 1	14:00	RAA
Calcium - Total	397	mg/l	1.0	6010D	26 Mar 21 1	10:32	MDE
Boron - Total	< 0.5 @	mg/1	0.10	6010D	24 Mar 21 1	12:46	MDE

* Holding time exceeded

Approved by:

Claudette K. Canteo

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

= Due to concentration of other analytes

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

MVTL

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Quality Control Report

Lab ID: 21-W501 Project: MDU Heskett We

Work Order: 202182-0597

			Oloce wer	- Trepit			TI OLIK OI	401. 202	102 007								
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	90	80-120	0.400	21-W477	0.36	0.74	95	75-125	0.74	0.72	90	2.7	20	2	9	< 0.1 < 0.1
Calcium - Total mg/l	100	109	80-120	500 2000 500	21D763q 21-M1496 21W501q	34.4 < 20 397	560 2040 900	105 102 101	75-125 75-125 75-125	560 2040 900	560 2040 895	105 102 100	0.0 0.0 0.6	20 20 20			<1 <1
Chloride mg/l	30.0 30.0	95 95	80-120 80-120	30.0	21-W511	<2	29.0	97	80-120	29.0	29.0	97	0.0	20	0	4	<2 <2
Fluoride mg/l	0.50	104	90-110	0.500 0.500	21-D689 21-W507	1.59 0.24	2.05 0.70	92 92	80-120 80-120	2.05 0.70	2,08 0.71	98 94	1.5 1.4	20 20		*	< 0.1 < 0.1
pH units		À.	3	7		12.				12.4 7.2	12.4 7.4	2.	0.0 2.7	20 20			:
Sulfate mg/l	100	103	80-120	100	21-W503	< 5	100	100	80-120	100	100	100	0.0	20	(Grand	. s. T 1	< 5
Total Dissolved Solids mg/l		, in	3		•	-	-	•		10600 10400	10500 10400		0.9	20 20		7	< 10

Samples were received on 23 Mar 2021 at 1400.

Temperature upon receipt at the Bismarck laboratory was 3.6°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report,

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here:

For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.

Approved by:

TAPROT



Chain of Custody Record

Project Name	e:	Event:	Work Order Number:
	MDU Heskett	Spring 2021	82-0597
Report To: Attn: Address: Phone: Email:	Montana-Dakota Utilities Todd Peterson 400 North 4th St. Bismarck, ND 58501 701-425-2427 todd.peterson@mdu.com	CC:	Collected By: Darren Niuswaag

Lab Number	Sample ID	Oorle	^{Tim} e	Samon	J. The	Son Ray	20/11/11/20/2	25/11/11/25/25/25/25/25/25/25/25/25/25/25/25/25/	I l'ill sour laire	Temp (c)	Soc. Com.	i Ha	Turbidity On T	Analysis Required
W501	MW1-90	23Mar 21	0929	GW	X	X	X	X		6,26	10530	6.89	0.65	
														MDU Heskett Spring 2021

Relinquished By			Received By				
Date/Time	Location	Temp (°C)	Name	Date/Time			
23mar21	(log ln		69	23Mar21			
1400	Walk In #2	TM562 / TM805	c camy	1400			
V (2006) 10 (10)		ROT 3.6					
	23 mar21	Date/Time Location 23 na/21 tog in Walk in #2	23 mar 21 tog In TM562 / TM808	Date/Time Location Temp (°C) Name 23 nar21 Log In Walk In #2 TM562 / TM805			



Field Datasheet

Groundwater Assessment

Company: MDU Heskett

Event: Spring 2021

Sample ID: $j-q_i$

Sampling Personal: Darren Miesway

Phone: (701) 258-9720 **Weather Conditions:** Wind: Precip: Temp: Sunny / Partly Cloudy / Cloudy **WELL INFORMATION** SAMPLING INFORMATION Bladder Well Locked? YES NO Purging Method: **Control Settings:** Well Labeled? XES Sampling Method: Bladder NO Purge: Sec. XES Dedicated Equipment? YES Casing Strait? NO NO Recover: Sec. Not Visible **Grout Seal Intact?** YES NO PSI: Repairs Necessary? Duplicate Sample? YES (NO) Casing Diameter: Duplicate Sample ID: Water Level Before Purge .99 ft ft Total Depth of Well: **Bottle List:** liters Well Volume: 1 Liter Raw ft Depth to Top of Pump: 500mL Nitric ft Water Level After Sample: 2110 500mL Nitric (filtered) Measurement Method: **Electric Water Level Indicator** 250mL Sulfuric FIELD READINGS Stabilization Parameters Temp. Spec. DO ORP **Turbidity** Pumping Liters Appearance or Comment рΗ Water Level (3 Consecutive) (°C) Cond. (mg/L) (mV) (NTU) Rate Removed Clarity, Color, Odor, Ect. ±0.5° ±5% ±0.1 (ft) **Purge Date** Time ±10% ±10 mL/Min clear, slightly turbid, turbid Start of Well Purge 500 a 23Map21 100 500 20 500 500 100 100 Well Stabilized? YES Total Volume Purged: 2 < 20 NO Liters **Turbidity** Spec. **Appearance or Comment** Temp. **Sample Date** Time рΗ (°C) Cond. (NTU) Clarity, Color, Odor, Ect. 23Mar 2 165 Comments:



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APP IV

CERTIFICATE of ANALYSIS - CCR

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: MW1-90

Event and Year: Spring 2021

Report Date: 31 Mar 21 Lab Number: 21-W501 Work Order #: 82-0597 Account #: 002800

Date Sampled: 23 Mar 21 9:29 Date Received: 23 Mar 21 14:00 Sampled By: MVTL Field Services

PO #: 185968 OP

Temp at Receipt: 3.6C ROI

	As Receive Result	no moderno		Method Reference	Date Analyz	Analyst	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	26 Mar	21 12:11	MDE
Lithium - Total	0.690	mg/l	0.020	6010D	24 Mar	21 13:18	MDE
Antimony - Total	< 0.001	mg/l	0.0010	6020B	26 Mar	21 9:43	CC
Arsenic - Total	< 0.002	mg/l	0.0020	6020B	26 Mar	21 9:43	CC
Barium - Total	0.0082	mg/l	0.0020	6020B	26 Mar	21 9:43	CC
Beryllium - Total	< 0.0005	mg/1	0.0005	6020B	26 Mar	21 9:43	CC
Cadmium - Total	< 0.0005	mg/1	0.0005	6020B	26 Mar	21 9:43	CC
Chromium - Total	< 0.002	mg/1	0.0020	6020B	26 Mar	21 9:43	CC
Cobalt - Total	< 0.002	mg/l	0.0020	6020B	26 Mar	21 9:43	CC
	< 0.0005	mg/l	0.0005	6020B	26 Mar	21 9:43	CC
Lead - Total	< 0.002	mg/1	0.0020	6020B	26 Mar	21 9:43	CC
Molybdenum - Total	< 0.002	mg/1	0.0050	6020B	26 Mar	21 9:43	CC
Selenium - Total Thallium - Total	< 0.005	mg/1	0.0005	6020B	26 Mar	21 9:43	CC

Approved by:

Clauditte K Cantep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL = Method Reporting Limit

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

= Due to sample matrix # = Due to come to sample quantity # = Due to income to income the property # = Due to income the propert

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

CERTIFICATION: ND # ND-00016



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Quality Control Report
Lab ID: 21-W501

Lab ID: 21-W501 Project: MDU Heskett Work Order: 202182-0597

Lab ID: 21-W501		Pr	oject: MI	JU Heske	ett	1	Work Or	'der: 202	.182-059	7							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Antimony - Total mg/l	0.1000	103	80-120	0.400 0.100	21-W474 21-W508	< 0.001 < 0.001	0.4182 0.1006	105 101	75-125 75-125	0.4182 0.1006	0.4300 0.0964	108 96	2.8 4.3	20 20	-	-	< 0.001
Arsenic - Total mg/l	0.1000	102	80-120	0.400 0.100	21-W474 21-W508	< 0.002 < 0.002	0.4138 0.0986	103 99	75-125 75-125	0.4138 0.0986	0.4274 0.0968	107 97	3.2 1.8	20 20	-	-	< 0.002
Barium - Total mg/l	0.1000	102	80-120	0.400 0.100	21-W474 21-W508	0.0823 0.0094	0.4734 0.1068	98 97	75-125 75-125	0.4734 0.1068	0.4940 0.1032	103 94	4.3 3.4	20 20	-	-	< 0.002
Beryllium - Total mg/l	0.1000	102	80-120	0.400 0.100	21-W474 21-W508	< 0.0005 < 0.0005	0.4422 0.1066	111 107	75-125 75-125	0.4422 0.1066	0.4570 0.1018	114 102	3.3 4.6	20 20	-	-	< 0.000
Cadmium - Total mg/l	0.1000	105	80-120	0.400 0.100	21-W474 21-W508	< 0.0005 < 0.0005	0.4026 0.0917	101 92	75-125 75-125	0.4026 0.0917	0.4154 0.0884	104 88	3.1 3.7	20 20	-	-	< 0.000
Chromium - Total mg/l	0.1000	103	80-120	0.400 0.100	21-W474 21-W508	0.0050 < 0.002	0.4008 0.1066	99 107	75-125 75-125	0.4008 0.1066	0.4228 0.1036	104 104	5.3 2.9	20 20		-	< 0.002
Cobalt - Total mg/l	0.1000	104	80-120	0.400 0.100	21-W474 21-W508	< 0.002 < 0.002	0.3996 0.1050	100 105	75-125 75-125	0.3996 0.1050	0.4198 0.1020	105 102	4.9 2.9	20 20	-	-	< 0.002
Lead - Total mg/l	0.1000	102	80-120	0.400 0.100	21-W474 21-W508	< 0.0005 < 0.0005	0.3876 0.0933	97 93	75-125 75-125	0.3876 0.0933	0.4002 0.0895	100 89	3.2 4.2	20 20	_	_	< 0.0003
Lithium - Total mg/l	0.400	108	80-120	0.400	21-W477	0.064	0.518	114	75-125	0.518	0.510	112	1.6	20	-	-	< 0.02 < 0.02
Mercury - Total mg/l	0.0020	95	85-115	0.002 0.002	21-W477 21-W516	< 0.0002 < 0.0002	0.0018 0.0019	90 95	70-130 70-130	0.0018 0.0019	0.0019 0.0018	95 90	5.4 5.4	20 20	-	-	< 0.0002
Molybdenum - Total mg/l	0.1000	105	80-120	0.400 0.100	21-W474 21-W508	0.0423 < 0.002	0.4670 0.1100	106 110	75-125 75-125	0.4670 0.1100	0.4834 0.1056	110 106	3.5 4.1	20 20	-	-	< 0.002

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Quality Control Report

Lab ID: 21-W501 Project: MDU Heskett Work Order: 202182-0597

Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Rec	Matrix Spike % Rec Limits	Dup Orig	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Rec	Known % Rec Limits	Method Blank
Selenium - Total mg/l	0.1000	100	80-120	0.400 0.100	21-W474 21-W508	0.0202 < 0.005	0.4120 0.0908	1 6 6	75-125 75-125	100000000000000000000000000000000000000	0.4472 0.0872	107 87	8.2 4.0	20 20		160	< 0.005
Thallium - Total mg/l	0.1000	96	80-120	0.400 0.100	21-W474 21-W508	< 0.0005 < 0.0005	100000000000000000000000000000000000000	92 89	75-125 75-125	0.3684 0.0892	0.3838 0.0856	96 86	4.1 4.1	20 20	1	2	< 0.0005

Samples were received on 23 Mar 2021 at 1400.

Temperature upon receipt at the Bismarck laboratory was 3.6°C.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

All holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here:

For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.

Approved by: C-Canto



Chain of Custody Record

Project Nam	e:	Event:	Work Order Number:	
	MDU Heskett	Spring 2021	82-0597	
Report To: Attn: Address: Phone: Email:	Montana-Dakota Utilities Todd Peterson 400 North 4th St. Bismarck, ND 58501 701-425-2427 todd.peterson@mdu.com	CC:	Collected By: Darren Nieswarg	

Lab Number	Sample ID	Optio	Time	Samol	1/11/00 /	500 Raw	200 Miles	Life Selection of the Control of the	Comp (c)	Spec Com	; / 5	Turbidity m.	Analysis Required
W501	MW1-90	23Mar 21	0929	GW	X)	K X		6	,26	10530	6.89	0.65	
						Ŧ	-						MDU Heskett Spring 2021

Comments:

Relinquished By		Sample	Condition	Received By					
Name	Date/Time	Location	Temp (°C)	Name	Date/Time				
De ali	23mar21	dog ln≥		690	23Maral				
9/0/1/	1400	Walk In #2	TM562 / TM805	c any	1400				
			ROT 3.6						



Field Datasheet

Groundwater Assessment

Company:	MDU	Hesket

Event: Spring 2021

Sample ID: 1-90

Sampling Personal: Davien Niesway

Phone: (701) 258-9720 Precip: Wind: Sunny / Partly Cloudy / Cloudy Weather Conditions: Temp: SAMPLING INFORMATION **WELL INFORMATION** √NO Bladder Control Settings: Well Locked? YES Purging Method: XES 2 Well Labeled? NO Sampling Method: Bladder Purge: Sec. XES **Dedicated Equipment?** YES NO Casing Strait? Recover: Sec. NO Not Visible NO PSI: **Grout Seal Intact?** YES Duplicate Sample? (NO) Repairs Necessary? YES Casing Diameter: Duplicate Sample ID: ,99 Water Level Before Purge: ft ft Total Depth of Well: **Bottle List:** Well Volume: liters 1 Liter Raw ft Depth to Top of Pump: 500mL Nitric ft Water Level After Sample: 2110 500mL Nitric (filtered) Electric Water Level Indicator Measurement Method: 250mL Sulfuric FIELD READINGS Stabilization Parameters DO ORP **Turbidity Pumping** Liters **Appearance or Comment** Temp. Spec. Water Level рΗ (3 Consecutive) (°C) (NTU) Rate Clarity, Color, Odor, Ect. Cond. (mg/L) (mV) Removed **Purge Date** Time ±0.5° ±5% ±0.1 ±10% ±10 (ft) mL/Min clear, slightly turbid, turbid Start of Well Purge 500 100 500 23Map21 20 500 0,44 12,12 100 500 2.10 100 100 Well Stabilized? YES NO Total Volume Purged: 2 < 217 Turbidity Appearance or Comment Temp. Spec. **Sample Date** Time рΗ (°C) Cond. (NTU) Clarity, Color, Odor, Ect. 23Mar 2 Comments:



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Amended 27Oct21 (Ba, Mo added) - STATE

Todd Peterson

Montana-Dakota Utilities Co.

400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: MW1-90

Event and Year: Fall 2021

Report Date: 13 Sep 21 Lab Number: 21-W3055 Work Order #: 82-2248 Account #: 002800

Date Sampled: 25 Aug 21 8:40 Date Received: 25 Aug 21 9:27 Sampled By: MVTL Field Services

PO #: 185968 OP

Temp at Receipt: 6.0C ROI

	As Receive Result	d	Method RL	Method Reference	Date Analyzed	Analyst
Metal Digestion				EPA 200.2	25 Aug 21	RAA
Conductivity (EC)	10748	umhos/cm	1	SM2510B-11	25 Aug 21 18:00	RAA
pH - Field	6.83	units	NA	SM 4500 H+ B	25 Aug 21 8:40	JSM
HQ	* 7.2	units	0.1	SM4500-H+-B-11	25 Aug 21 18:00	RAA
Temperature - Field	10.8	Degrees C	NA	SM 2550B	25 Aug 21 8:40	JSM
Total Alkalinity	476	mg/l CaCO3	20	SM2320B-11	25 Aug 21 18:00	RAA
Bicarbonate	476	mg/l CaCO3	20	SM2320B-11	25 Aug 21 18:00	RAA
Carbonate	< 20	mg/l CaCO3	20	SM2320B-11	25 Aug 21 18:00	RAA
Hydroxide	< 20	mg/l CaCO3	20	SM2320B-11	25 Aug 21 18:00	RAA
Conductivity - Field	10619	umhos/cm	1	EPA 120.1	25 Aug 21 8:40	JSM
Tot Dis Solids (Summation)	11000	mg/1	12.5	SM1030-F	1 Sep 21 10:17	Calculated
Total Hardness as CaCO3	4700	mg/1	NA	SM2340B-11	27 Aug 21 12:23	Calculated
. 7 C C C 70.700 70.700 70.70 70.700 . 70. 70. 70	163	meg/L	NA	SM1030-F	27 Aug 21 12:23	Calculated
Cation Summation	173	meq/L	NA	SM1030-F	1 Sep 21 10:17	Calculated
Anion Summation	-2.85	*	NA	SM1030-F	1 Sep 21 10:17	Calculated
Percent Error	10.0	•	NA	USDA 20b	27 Aug 21 12:23	Calculated
Sodium Adsorption Ratio	1.09	mg/1	0.10	SM4500-F-C	25 Aug 21 18:00	RAA
Fluoride	7670	mg/1	5.00	ASTM D516-11	1 Sep 21 10:17	SD
Sulfate		mg/1	2.0	SM4500-C1-E-11	25 Aug 21 14:06	SD
Chloride	98.4	mg/1	0.20	EPA 353.2	26 Aug 21 10:49	EV
Nitrate-Nitrite as N	12.6		0.20	EPA 365.1	27 Aug 21 10:11	SD
Phosphorus as P - Total	< 0.2	mg/1	0.0002	EPA 245.1	31 Aug 21 14:23	MDE
Mercury - Dissolved	< 0.0002	mg/1	1.0	6010D	27 Aug 21 12:23	SZ
Calcium - Total	398	mg/l	1.0	6010D	27 Aug 21 12:23	SZ
Magnesium - Total	900	mg/l	1.0	6010D	27 Aug 21 12:23	SZ
Sodium - Total	1580	mg/l	1.0	6010D	27 Aug 21 12:23	SZ
Potassium - Total	25.0	mg/l		6010D	26 Aug 21 12:35	MDE
Barium - Dissolved	< 0.5 @	mg/l	0.10		26 Aug 21 12:35	MDE
Iron - Dissolved	< 0.5 @	mg/l	0.10	6010D	26 Aug 21 12:35	MDE
Manganese - Dissolved	< 0.25 ⊚	mg/l	0.05	6010D	26 Aug 21 12:35	MDE
Molybdenum - Dissolved	< 0.5 @	mg/l	0.10	6010D		SZ
Boron - Dissolved	< 0.5 @	mg/l	0.10	6010D	26 Aug 21 14:37 9 Sep 21 9:17	MDE
Arsenic - Dissolved	< 0.005 ^	mg/l	0.0020	6020B		MDE
Cadmium - Dissolved	< 0.0005	mg/l	0.0005	6020B	9 Sep 21 9:17	12/4 27/2 21/2
Chromium - Dissolved	< 0.005 ^	mg/l	0.0020	6020B	9 Sep 21 9:17	MDE
Lead - Dissolved	< 0.0005	mg/l	0.0005	6020B	9 Sep 21 9:17	MDE

RL = Method Reporting Limit

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

= Due to sample matrix # = Due to continue to sample quantity + = Due to in

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

CERTIFICATION: ND # ND-00016



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Amended 270ct21 (Ba, Mo added) - STATE

Todd Peterson Montana-Dakota Utilities Co. 400 N 4th St

Bismarck ND 58501

Project Name: MDU Heskett

Sample Description: MW1-90

Event and Year: Fall 2021

Report Date: 13 Sep 21 Lab Number: 21-W3055 Work Order #: 82-2248 Account #: 002800

Date Sampled: 25 Aug 21 8:40 Date Received: 25 Aug 21 9:27 Sampled By: MVTL Field Services

PO #: 185968 OP

Temp at Receipt: 6.0C ROI

	As Received Result	Method RL	Method Reference	Date Analyzed	Analyst
Selenium - Dissolved Silver - Dissolved	0.0072 mg/l < 0.0005 mg/l	0.0050	6020B 6020B	9 Sep 21 9 9 Sep 21 9	

^{*} Holding time exceeded

Approved by:

Claudette K. Canrep

Claudette K. Carroll, Laboratory Manager, Bismarck, ND

RL - Method Reporting Limit

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

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

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

CERTIFICATION: ND # ND-00016

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



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Quality Control Report

Lab ID: 21-W3055 Project: MDU Heskett Work Order: 202182-2248

Lab ID: 21-W3055		Pr	oject: MI	DU Hesko	ett	7	Work Or	der: 202	182-2248	8							
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
Arsenic - Dissolved mg/l	0.0160	104	80-120	0.100 0.100	21W3039q 21W3081q	< 0.005 < 0.005	0.1172 0.1252	117 125	75-125 75-125	0.1172 0.1252	0.1160 0.1182	116 118	1.0 5.8	20 20	-	-	< 0.005
Barium - Dissolved mg/l	0.40	108	80-120	5.00	21W3070q	< 0.5	4.95	99	75-125	4.95	4.89	98	1.2	20	-	-	< 0.1 < 0.1
Boron - Dissolved mg/l	0.40	102	80-120	0.400	21-W3076	0.51	0.83	80	75-125	0.83	0.82	78	1.2	20	-	-	< 0.1 < 0.1
Cadmium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	21W3039q 21W3081q	< 0.0005 < 0.0005	0.1095 0.1100	110 110	75-125 75-125	0.1095 0.1100	0.1109 0.1132	111 113	1.3 2.9	20 20	-	-	< 0.0005
Calcium - Total mg/l	100	105	80-120	100	21W3069q	64.5	156	92	75-125	156	154	90	1.3	20	-	-	< 1 < 1
Chloride mg/l	30.0 30.0	95 95	80-120 80-120	30.0 30.0	21-W3049 21-W2964	<2 31.1	28.5 62.3	95 104	80-120 80-120	28.5 62.3	28.6 62.4	95 104	0.4 0.2	20 20	-	-	< 2 < 2
Chromium - Dissolved mg/l	0.0160	102	80-120	0.100 0.100	21W3039q 21W3081q	< 0.005 < 0.005	0.1028 0.1056	103 106	75-125 75-125	0.1028 0.1056	0.1012 0.1050	101 105	1.6 0.6	20 20	-	-	< 0.005
Conductivity (EC) umhos/cm	-	-	-	-	-	-	-	-	-	2066 9072	2074 9089	-	0.4 0.2	20 20	-	-	-
Fluoride mg/l	0.50 0.50	100 100	90-110 90-110	0.500 0.500	21-W3040 21-W3053	0.81 0.30	1.26 0.81	90 102	80-120 80-120	1.26 0.81	1.27 0.90	92 120	0.8 10.5	20 20	-	-	< 0.1 < 0.1
lron - Dissolved mg/l	0.40	110	80-120	5.00	21W3070q	2.64	7.10	89	75-125	7.10	7.00	87	1.4	20	-	-	< 0.1 < 0.1
Lead - Dissolved mg/l	0.0160	99	80-120	0.100 0.100	21W3039q 21W3081q	< 0.0005 < 0.0005	0.0994 0.1002	99 100	75-125 75-125	0.0994 0.1002	0.0972 0.0985	97 98	2.2	20 20	-	-	< 0.0005
Magnesium - Total mg/l	100	102	80-120	100	21W3069q	26.9	122	95	75-125	122	120	93	1.7	20	-	-	< 1 < 1
Manganese - Dissolved mg/l	0.40	110	80-120	5.00	21W3070q	< 0.25	4.97	99	75-125	4.97	4.88	98	1.8	20	-	-	< 0.05 < 0.05

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Quality Control Report

ab ID: 21-W3055 Project: MDU Heskett Work Order: 202182-2248

Lab ID: 21-W3055		Pr	oject: MI	OU Heske	ett	,	Nork Or	der: 202	182-2248	3							
Analyte	LCS Spike Amt	LCS Rec %	LCS % Rec Limits	Matrix Spike Amt	Matrix Spike ID	Matrix Spike Orig Result	Matrix Spike Result	Matrix Spike Rec %	Matrix Spike % Rec Limits	MSD/ Dup Orig Result	MSD/ Dup Result	MSD Rec %	MSD/ Dup RPD	MSD/ Dup RPD Limit (<)	Known Rec (%)	Known % Rec Limits	Method Blank
Mercury - Dissolved mg/l	0.0020	95	85-115	0.002 0.002	21-W3048 21-W3117	< 0.0002 < 0.0002	0.0018 0.0019	90 95	70-130 70-130	0.0018 0.0019	0.0015 0.0017	75 85	18.2 11.1	20 20	-	-	< 0.0002
Molybdenum - Dissolved mg/l	0.40	105	80-120	5.00	21W3070q	< 0.5	4.81	96	75-125	4.81	4.78	96	0.6	20	-	-	< 0.1 < 0.1
Nitrate-Nitrite as N mg/l	0.50	102	90-110	1.00	21-W3070 21-W2989	1.32 0.68	2.41 1.74	109 106	90-110 90-110	2.41 1.74	2.41 1.73	109 105	0.0 0.6	20 20	-	-	< 0.2
pH units	-	-	-	-	-	-	-	-	-	8.6 7.6	8.6 7.4	-	0.0 2.7	20 20	-	-	-
Phosphorus as P - Total mg/l	0.50	102	90-110	1.00	21-W3049	< 0.2	1.00	100	90-110	1.00	1.00	100	0.0	20	-	-	< 0.2
Potassium - Total mg/l	100	100	80-120	100	21W3069q	10.0	106	96	75-125	106	104	94	1.9	20	-	-	< 1 < 1
Selenium - Dissolved mg/l	0.0160	97	80-120	0.100 0.100	21W3039q 21W3081q	< 0.005 < 0.005	0.1302 0.1310	130 131	75-125 75-125	0.1302 0.1310	0.1221 0.1347	122 135	6.4 2.8	20 20	-	-	< 0.005
Silver - Dissolved mg/l	0.0160	101	80-120	0.100 0.100	21W3039q 21W3081q	< 0.0005 < 0.0005	1	76 72	75-125 75-125	0.0756 0.0718	0.0765 0.0718	76 72	1.2 0.0	20 20	-	-	< 0.0005
Sodium - Total mg/l	100	101	80-120	500	21W3069q	306	775	94	75-125	775	790	97	1.9	20	-	-	< I < 1
Sulfate mg/l	100	104	80-120	100	21-W3090	60.6	143	82	80-120	143	146	85	2.1	20	_	-	< 5
Total Alkalinity mg/l CaCO3	410 410	92 92	90-110 90-110		21-W3047 21-W3051	543 579	891 877	85 73	80-120 80-120	891 877	844 828	73 61	5.4 5.7	20 20	93	80-120	< 20 < 20

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Page: 3 of 3

Quality Control Report Lab ID: 21-W3055

Project: MDU Heskett

Work Order: 202182-2248

Samples were received in good condition on 25 Aug 2021 at 0927.

Temperature upon receipt at the Bismarck laboratory was 6.0°C. Samples were received on ice and evidence of cooling had begun.

All samples were properly preserved unless noted here and/or flagged on the individual analytical laboratory report.

With the exception of pH, all holding times were met.

Approved methodology was followed for all sample analyses.

All acceptance criteria were met for calibration, method blanks, laboratory control samples, laboratory fortified matrix/duplicates unless noted here:

- For some analytes, the reported results were elevated due to additional dilutions required to minimize the effects of sample matrix.
- For some analytes, the reported results were elevated due to instrument performance at the lower limit of quantitation (LLOQ).
- The recoveries for one silver matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix and the use of HCI in the digestion. Data was accepted based on acceptable recovery of the LCS and/or the post digestion spike. No further action was taken.
- The recoveries for one selenium matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. LCS was acceptable. 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 duplicate was acceptable.
 No further action was taken.
- The recoveries for one alkalinity matrix spike/matrix spike duplicate were outside the acceptable limits. RPD for the recoveries was within limits. Poor recoveries were determined to be due to sample matrix. LCS was acceptable. No further action was taken.
- Recovery for one alkalinity matrix spike duplicate was outside of the acceptable limits. Recovery of the matrix spike was acceptable.
 RPD for the recoveries of the matrix spike duplicate was acceptable.
 LCS was acceptable. No further action was taken.

Approved by: C- Cant D

28 Sep 21

Claudette Carroll

From:

Anna Schneider < ASchneider@barr.com>

Sent:

Tuesday, October 26, 2021 3:53 PM

To:

Claudette Carroll

Cc:

Barr Data Management

Subject:

Report 202182-2248

Follow Up Flag:

Follow up

Flag Status:

Flagged

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi Claudette,

I took a quick look at the 202182-2248 report. I noted that barium and molybdenum were not included in the report for sample MW1-90. Could please you provide a revised report? It looks like they were included in the EDD.

Thank you,

Anna Schneider

Data Quality Specialist/Data Management Technician Minneapolis, MN office: 952.832.2771 ASchneider@barr.com www.barr.com

www.bdir.com



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Field Datasheet

Groundwater Assessment

Company:	MDU Heskett	
Event:	Fall 2021	
Sample ID:	1-90,	
Sampling Personal:	Josh	

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

Weather Conditions:		Temp:	W	°F	Wind:	N	@5-10		Precip:	Sunny / Ra	ortly Cloudy / Cloud	iy
WELL INFORMATION					•		SAM	IPLING IN	FORMATIO	NC		
Well Locked?		YES NO		1	Purging Method:		Bladder			Control Sett	ings:	
Well Labeled?	YES	NO				Sampling M		Bladder			Purge: 5	Sec.
Casing Strait?	YES	NO			1	Dedicated E	quipment?	(PES)	NO		Recover: 乞乡	Sec.
Grout Seal Intact?	YES	NO	Not V	isible	1						PSI: /S	
Repairs Necessary?				,		Duplicate Sa	imple?	YES	(NO)			
	g Diameter:	2				Duplicate Sa	ample ID:		-			
Water Level Be	fore Purge:	13,6		ft						-		
Total De	oth of Well:		*	ft			Bottle	e List:				
W	ell Volume:			liters		1 Liter Raw						
Depth to To	p of Pump:			ft		500mL Nitric						
Water Level Af	ter Sample:	13,		ft		500mL Nitric	(filtered)					
Measureme	nt Method:	Electric V	Vater Level	Indicator		250mL Sulfur	ic			[
					FIE	LD READIN	GS					
Stabilization Paran	neters	Temp.	Spec.	рН	DO	ORP	Turbidity	Water Level	Pumping	mL	Appearance or C	omment
(3 Consecutive	≘)	(°C)	Cond.	þπ	(mg/L)	(mV)	(NTU)		Rate	Removed	Clarity, Color, O	
Purge Date	Time	±0.5°	±5%	±0.1	±10%	±10		(ft)	mL/Min	L	clear, slightly turb	ıīd, turbīd
	0810	Start of Well	Purge									
	OBi S	10,10	१०५२५	6.63	1,54	175.7	0.63	13.82	1000	500.0	Clear	
	0825	10.85	10597	6.83	1,95	124,5	ルロス	13.62	1000	1000'0	ilen	
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Camala Data	Time	Temp.	Spec.	nU			Turbidity				Appearance or C	omment
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Chain of Custody Record

Project Name	e:	Event:	Work Order Number:
1.50	MDU Heskett	Fall 2021	82-2248
Report To: Attn: Address: Phone: Email:	Montana-Dakota Utilities Todd Peterson 400 North 4th St. Bismarck, ND 58501 701-425-2427 todd.peterson@mdu.com	CC:	Collected By:

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Appendix B

Alternative Source Demonstration Reports



Alternative Source Demonstration: August 2021 Event

R.M. Heskett Station

Prepared for Montana-Dakota Utilities Co.

April 2022

Alternative Source Demonstration August 2021 Event

April 2022

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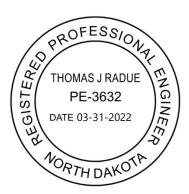
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Certifications

I hereby certify that I, or my agent, have examined this written demonstration and attest that this Coal Combustion Residuals Facility Alternative Source Demonstration (ASD) is accurate and has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR §257.94. I further certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of North Dakota.

Revision	Date	Summary of Revisions
0	April 12, 2022	August 2021 Event Alternative Source Demonstration



Thomas J. Radue

1.0 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operates R.M. Heskett Station (Site), a coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). One CCR (coal combustion residual) unit, as defined by 40 CFR 257.53, is located on the property. The CCR unit contains coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning tire-derived fuel (TDF) at the facility.

The CCR Rule (US EPA, 2015) §257.94(e)(2) allows for an alternative source demonstration (ASD) in the event of an identified statistically significant increase (SSI) in a water quality parameter in a downgradient monitoring well over background levels:

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

The purpose of this work is to evaluate the data collected as part of the August 2021 monitoring event, along with historical data, to demonstrate if the potential SSIs are the results of a "source other than the CCR unit" or due to natural variation in groundwater quality, an error in sampling, analysis, or statistical evaluation.

2.0 August 2021 SSIs

Sampling for the second detection monitoring event in 2021 was conducted August 23-25, 2021. Four potential SSIs over background were identified: sulfate and total dissolved solids (TDS) at MW-104, fluoride at MW2-90, and chloride at MW-105 (see time series plots in Appendix A and prediction limit plots in Appendix B).

Evaluations were undertaken to review potential alternative sources for the SSIs. These evaluations included comparing leaching tests of on-site CCR materials, leachate collected in the Evaporation Pond (non-CCR unit), regional (background) groundwater quality data, and groundwater quality data collected at the site prior to construction of the CCR unit.

Several characteristics of the CCR unit site geology, groundwater monitoring well locations, and historic groundwater quality data prompted consideration of potential alternative sources for the potential SSIs, including elevated water quality parameters in pre-landfill groundwater monitoring data, site-specific geologic conditions, and/or leakage from the Evaporation Pond (non-CCR unit).

A successful demonstration of alternative source(s) for the potential SSIs are discussed in Section 3.0.

2.1 August Sampling Event

Concentrations for potential SSIs observed in August 2021 are presented in Table 1 and are consistent with those observed during the prior seven detection monitoring events.

Table 1. Detection Monitoring Results for Potential SSI Well-Parameter Pairs

		Interwell	Detection Monitoring Results (mg/L)									
Well	Parameter	Prediction Limit (mg/L)	April 2018	Oct. 2018	April 2019	Sept. 2019	April 2020	Sept. 2020	March 2021	August 2021		
MW-104	Sulfate	7,300	10,700	11,000	11,100	11,300	10,300	10,700	11,000	11,600		
MW-104	TDS	10,400	17,400	18,000	17,700	17,200	16,500	17,900	18,000	17,500		
MW-105	Chloride	271	333	384	282	290	278	339	261	280		
MW2-90	Fluoride	0.98	1.03	1.00	1.02	1.03	0.98	1.01	1.04	1.02		

Bolded values indicate concentrations exceed the associated interwell predication limits.

Trend analysis results indicate:

- Sulfate at MW-104, though above the prediction limit, does not have a statistically significant trend.
- TDS at MW-104 has a statistically significant increasing trend.
- Chloride at MW-105, though above the prediction limit, has a statistically significant decreasing trend.

• Fluoride at MW2-90, though above the prediction limit, does not have a statistically significant trend.

Methods used to evaluate potential alternative sources as the basis for water quality parameter concentrations over background from the August 2021 detection monitoring event are discussed in Section 3.0.

2.2 Verification Sampling

No verification sampling was conducted on the potential SSIs.

3.0 Alternative Source Demonstration

Successful demonstrations of alternative sources have previously been documented for the four potential SSIs. The associated ASD Reports (Barr, 2018a; Barr, 2018b; Barr, 2019a; Barr, 2019b; Barr, 2020a; Barr, 2020b; Barr, 2021a; Barr 2021b) documented that each of the SSIs could be explained by natural groundwater quality variability based on concentrations that were either present at the Site before the landfill was constructed, consistent with regional groundwater quality data, and/or associated with a release from the Evaporation Pond (non-CCR unit).

The purpose of this ASD Report is to validate the results of prior findings with the August 2021 data. For each potential SSI, three hypotheses regarding the potential source of the SSI are assessed: 1) a release of leachate from the CCR unit is the source of one or more of the potential SSIs; 2) natural variations of prelandfill or regional groundwater quality is the source of one or more of the potential SSIs; or 3) a release of leachate from the Evaporation Pond (non-CCR unit) is the source of one or more of the potential SSIs.

3.1 Source Hypothesis #1: CCR Unit Release

To accept the hypothesis that a release of leachate from the CCR unit is the source of one or more of the potential SSIs, it would be assumed that groundwater chemistry at one or more potentially impacted wells (MW2-90, MW-104, and/or MW-105) would be geochemically similar to impacted water from the CCR unit represented by leach tests results. However, if they are geochemically dissimilar, this indicates that a source "other than the CCR unit" may be responsible for the potential SSI. Therefore, major ion chemistry from the CCR monitoring locations (upgradient and downgradient) was compared to CCR Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312) data collected July 2011 (Appendix C).

To test this hypothesis, Piper diagrams (Figure 2) were used to visually compare the CCR SPLP results (Appendix C) and the measured groundwater quality at the Site. Piper diagrams are plots of major ion chemistry of water samples (calcium, magnesium, potassium, sodium, chloride, sulfate, and alkalinity) that are used to differentiate between water types and to identify potential mixing of water types. This method is a means to identify or "fingerprint" water samples by their common characteristics (major ions) to assess which types of water are similar or dissimilar to potential source water types (Helsel and Hirsch, 2002). On the Piper diagram depicted in Figure 2, downgradient well compositions are shown as circular points, CCR SPLP compositions as red triangles, and the range of upgradient compositions as a blue polygon.

Downgradient water quality (including the potential SSI parameter-well pairs) is characterized as a Mg-SO₄ type water, whereas the ash SPLP results are Na-SO₄ type water. The major difference observed between the downgradient water quality and the SPLP results is the dominant cation concentration (magnesium vs. sodium). Because water quality data from SSI well-parameter pairs are clustered with data from that of the upgradient wells, which are Na-Mg-SO₄ to Mg-SO₄ type water, rather than near the SPLP results, it indicates that the water chemistry at those locations are more like upgradient groundwater than a potential release from the CCR unit. **Therefore, we reject the hypothesis that the CCR unit is the source of the sulfate and TDS observed at MW-104 and the fluoride at MW2-90.**

3.2 Source Hypothesis #2: Natural Variations of Pre-Landfill or Regional Groundwater Quality

As Source Hypothesis #1 (CCR Unit Release) was rejected as a potential source of the SSIs, natural variations of pre-landfill conditions and/or regional groundwater quality were evaluated for each of the potential SSIs. The second hypothesis evaluated is that concentrations of sulfate and TDS at MW-104 are consistent with historical (pre-landfill) or regional (background) groundwater data. To test this hypothesis, results of the August 2021 detection monitoring event were compared to pre-landfill data and/or regional groundwater quality data from the Cannonball Formation and associated units to determine if natural variation is a potential alternative source for the SSIs.

3.2.1 Chloride at MW-105

Results from groundwater samples collected in 1986 were included in the 1989 Special Use Disposal Site Permit Application (Permit Application; MDU, 1989). The 1986 samples were collected prior to construction of the CCR unit; an aerial photograph from March 30, 1988, shows the area of the CCR unit, which appears undisturbed (Appendix D).

Pre-landfill chloride concentrations collected from groundwater at the Site were measured as high as 558 mg/L (Well 44, 1986), indicating that high chloride concentrations pre-date construction of the CCR unit. Additionally, the North Dakota State Water Commission conducted a groundwater study in Morton County (Ackerman, 1980); 45 wells screened in the Cannonball and Ludlow Formations were sampled for various parameters including chloride. Chloride concentrations ranged from 0 to 500 mg/L (37% of which had concentrations greater than 250 mg/L).

Historic data shows that concentrations of chloride in groundwater at the Site measured prior to the construction of the CCR unit (558 mg/L) as well as regional groundwater quality data (0 to 500 mg/L) are consistent with and/or higher than chloride measured at MW-105 in August 2021 (280 mg/L). This supports the hypothesis that the SSI for chloride at MW-105 is due to a "source other than the CCR unit."

Therefore, we accept the hypothesis that chloride concentrations observed at MW-105 are consistent with regional (background) groundwater data.

3.2.2 Fluoride at MW2-90

Source Hypothesis #2 was tested by comparing fluoride concentrations collected as part of several regional groundwater quality studies on the Cannonball Formation and associated units. A summary of the range of fluoride concentrations in the Cannonball Formation and associated units are included in the table below.

Table 2. Fluoride Concentrations in Morton County, North Dakota

Reference	Fluoride Conc. Range	Formation/Units	Data Source Location
Ackerman, D.J., 1980. Ground-Water Resources of Morton County, North Dakota. North Dakota Geological Survey Bulletin 72, Part III. 51 p.	0.0 to 4.0 mg/L	Cannonball and Ludlow formations, undifferentiated	Morton County
Crosby, O.A. and Klausing, R.L., 1984. Hydrology of Area 47, Northern Great Plains and Rocky Mountain Coal Provinces, North Dakota, South Dakota, and Montana. USGS Water- Resources Investigations Open-File Report 83-221, 93 p.	0.1 to 6.3 mg/L	Entire Fort Union Formation (includes Cannonball Formation)	Morton County

The Ackerman study provides summary statistics for the fluoride concentrations observed in Morton County. Forty-six samples were analyzed for fluoride; of those, 20 (or 43%) had concentrations greater than 1.3 mg/L (Ackerman, 1980). The fluoride concentration observed at MW-2-90 in August 2021 (1.02 mg/L) is within the range of values consistent with naturally occurring concentrations of fluoride associated with the Cannonball Formation in Morton County. **Therefore, we accept the hypothesis that fluoride concentrations observed at MW-2-90 are consistent with regional (background) groundwater data.**

3.2.3 Sulfate and TDS at MW-104

Analyses of groundwater samples collected prior to construction of the CCR unit included in the Permit Application notes that high sulfate and TDS was observed at the Site. Maximum sulfate and TDS concentrations reported in 1986 (pre-landfill) were 11,632 mg/L and 14,917 mg/L, respectively, in Well 60 (approximately 700 feet southwest of MW-104), with similar concentrations observed two years later. Sulfate concentrations reported in August 2021 at MW-104 (11,600 mg/L) are within range of historically observed concentrations (Figure 3), but TDS concentrations (17,500 mg/L) are near the upper end of concentrations historically observed (Figure 4). Figures 3 and 4 show the range of sulfate and TDS concentrations, respectively, across the Site, including recent and historical monitoring well data.

The mineralogy of the underlying Fort Union Formation may yield an explanation for the elevated sulfate concentrations (which leads to elevated TDS concentrations). The dominant lithology observed at the Site is unconsolidated silt in a clay matrix with interspersed fine to medium-grained sand (10% to 30%). Small gypsum crystals are documented discontinuously throughout the upper 30 feet of the surface materials, which have been presumed to be the result of diagenetic processes which occur above the water table during alternating wetting and drying cycles (Groenewold et al., 1983). Gypsum is a hydrated calcium sulfate mineral that can be a source of high sulfate concentrations in groundwater.

The boring log for MW-104 (Appendix E) notes gypsum present throughout the upper layer of the screened interval. Boring logs for other CCR wells and pre-landfill wells note gypsum occurrences across the Site (Appendix E). The water level and screened interval in MW-104 are within the gypsum-bearing unit. In other wells with lower sulfate and TDS concentrations, the water levels and/or screened units are

below the documented gypsum occurrences. As groundwater fluctuates and surface water infiltration occurs, periodic dissolution of gypsum into the water column may occur, resulting in elevated sulfate concentrations (and therefore elevated TDS, too).

Based on presence of gypsum in native subsurface deposits and documentation of elevated sulfate and TDS in pre-landfill groundwater, the hypothesis that the SSI for sulfate and TDS at MW-104 may be due to natural conditions (a "source other than the CCR unit") is possible. However, a statistically significant increasing trend for TDS at MW-104 was observed. Natural/background groundwater can be affected by seasonality and/or site-wide aquifer changes, resulting in trending data; two other monitoring wells at the site have statistically significant increasing trends at the site: upgradient well MW-13 and downgradient well MW2-90 (conversely, MW-13 has a long-term (late 1980s to present) statistically significant decreasing trend). Seasonality was not detected in TDS or sulfate at MW-104. **Sulfate and TDS concentrations at MW-104 may be due to natural conditions; however, additional source considerations were evaluated.**

3.3 Source Hypothesis #3: Evaporation Pond Release

Two conditions are necessary to accept the hypothesis that a release of Evaporation Pond water is the source of one or more of the potential SSIs: (1) mechanism of release (such as an issue with Evaporation Pond liner integrity) and (2) geochemically similar groundwater chemistry at one or more of the potentially impacted wells with water from the Evaporation Pond. Based on proximity, only the SSIs observed at MW-104 (TDS and sulfate) are being evaluated for this potential source.

3.3.1 TDS and Sulfate at MW-104

A statistically significant increasing trend in TDS was observed at MW-104 following the August 2021 detection monitoring event. The only statistically significant trend observed for other Appendix III parameters at this location was for fluoride. Past ASD Reports (Barr, 2019b; Barr, 2020a; Barr, 2020b; Barr, 2021) attributed elevated sulfate and TDS concentrations at MW-104 to either natural conditions or a release from the Evaporation Pond. MW-104 is located between the CCR unit and the Evaporation Pond (a non-CCR unit). The Evaporation Pond was constructed to collect surface water run-off from the Site as well as leachate from the CCR Unit. Due to the relative proximity of MW-104 to the Evaporation Pond, an evaluation was conducted to assess the Evaporation Pond liner integrity, potential impacts to downgradient wells, and determine the geochemical feasibility of Evaporation Pond water contributing to the conditions observed at MW-104.

Liner Integrity Evaluation

In the 2010 Annual Report for the Special Waste Disposal Permit (SP-087), it was noted that erosion was encountered at the Evaporation Pond. More specifically, "cuts in the banks of the pond ranged from 8 to 24-inches. Erosion was caused from storm water running into the evaporation pond from closed Slots and the haul road" (MDU, 2011). No repairs were made at that time due to standing water in the pond. Similar erosional features were noted in the 2011 and 2012 Annual Reports, citing erosion cuts of 8 to 48-inches (MDU, 2012 and MDU, 2013). These erosion cuts were repaired in 2013 during the construction of Slot 10. Additionally, the 2013 Annual Report stated that "the west wall of the evaporation pond was raised and

graded to reroute storm water that accumulates outside of the ash disposal area from the cover of Phase I ash disposal site away from the pond during rain events" (MDU, 2014).

These reports did not specify if the erosional cuts were 8 to 48-inches wide or 8 to 48-inches deep. Based on the Phase I Development "as-constructed" Plan Sheets (January and November 1990), the Evaporation Pond was built with a 3-foot-thick compacted clay liner (MDU, 1989 Exhibit 6-B). If the erosional cuts were up to 48-inches deep, then the cuts would extend through the entirety of the liner thickness, creating a conduit for Evaporation Pond water to enter the groundwater. Additionally, no details were provided on the materials used for repairing the Evaporation Pond (i.e., if the liner was impacted, were the erosion cuts filled in with a comparable clay liner material).

Additionally, the integrity of the Evaporation Pond liner may have been compromised due to cation exchange. Time series plots of groundwater quality at nearby well MW1-90 (Appendix F) show an increase in sodium; this increase is most apparent at MW1-90 between 2012 and 2021. The Evaporation Pond liner may be composed of a clay with sodium as its main interlayer cation (e.g., sodium-montmorillonite and/or sodium-bentonite, which are common in the area (Groenewold et al., 1983)), and cation exchange processes can occur between the sodium in the clay and positively charged cations concentrated in the evaporation pond water (calcium, magnesium, potassium, and aluminum), increasing the concentration of dissolved sodium as it is released from the clay structure. Over time this exchange may decrease swelling potential and increase hydraulic conductivity of the clay constituting the pond liner, resulting in increased leakage of Evaporation Pond water.

Downgradient Impacts

The base of the Evaporation Pond sits at approximately 1675 feet above MSL whereas historical groundwater elevations in MW-104 and MW1-90 remain below 1675 feet MSL. Therefore, any water leaking from the Evaporation Pond would report radially downward into the groundwater, toward both MW-104 and MW1-90, reaching both wells downgradient of the Pond.

As MW-104 was installed on August 20, 2015, it is not possible to determine if the erosional cuts observed in the early 2010s impacted the water quality at this location. However, data has consistently been collected from nearby well MW1-90, also downgradient of the Evaporation Pond. As seen in the time series plots (Appendix F; 1990-2021), in approximately 2010 concentrations of chloride, sulfate, TDS, magnesium, sodium, and specific conductance at MW1-90 began increasing more rapidly. To a lesser extent, changes in concentrations were observed around this same time for potassium, nitrogen, and total alkalinity. This timing corresponds to when the erosional cuts at the Evaporation Pond were first observed in the Annual Monitoring Reports. The increasing trends have since continued, despite reports of the erosional cuts being repaired in 2013, except for chloride, which has since leveled off and is now decreasing.

Geochemical Feasibility

A simple mixing model was developed in April 2019 (Barr, 2019b) to determine the potential of producing a similar water quality observed at MW-104 (and MW1-90, as a historical analogue) when mixing Evaporation Pond water with unimpacted upgradient water. This mixing model was conducted in

Geochemist's Workbench® v.12.0, using data from water samples collected from the Evaporation Pond and upgradient monitoring well MW-103. The mixing model assumes a starting concentration equal to the upgradient groundwater concentrations and then iteratively mixes it with incremental amounts of Evaporation Pond water. The upgradient groundwater concentrations used in the model were from a sample from upgradient monitoring well MW-103 collected in April 2019, which is assumed to represent the long-term composition of groundwater in that vicinity due to the fairly stable concentrations of major ions exhibited in samples from MW-103 (Appendix A). The Evaporation Pond concentrations used in the model were from a sample collected from the pond in September 2014, which is assumed for the purposes of the model to represent a typical Evaporation Pond water composition during the period when the pond liner was compromised.

The results of the model are provided in Appendix G. Figure G.1 shows the results of the mixing model on a Piper diagram for MW-103. Downgradient wells MW-104 and MW1-90 are shown as gray and green diamonds, respectively. The blue line represents the various possible outcomes when mixing the upgradient water quality with the Evaporation Pond. The black circles represent specific proportions (1-part upgradient water to 0.01-, 0.05-, 0.1-, 0.5-, and 1-part Evaporation Pond water). Figure G.2 shows the results as Stiff plots. Table G.1 provides the numerical inputs and results of the various mixing proportions.

As shown on Figure G.1, the downgradient well compositions are similar to the chemistry anticipated if the Evaporation Pond is mixing with upgradient groundwater emanating from the proximity of monitoring well MW-103. The path of the mixing reaction from MW-103 to the Evaporation Pond transects MW-104 when 1-part upgradient (MW-103) water is mixed with as little as 0.05-part Evaporation Pond water. Therefore, it appears plausible that a relatively small portion of Evaporation Pond water would be needed to "impact" groundwater from upgradient to get a similar chemistry as observed downgradient in MW-104. The geometry of the Stiff plots in Figure G.2 shows the similarity in anionic concentrations and calcium in the mixing models.

Based on the description of erosional features extending upwards of 48 inches into the liner of the Evaporation Pond in 2010-2013 corresponding with the increased concentrations of several parameters observed in downgradient monitoring well MW1-90, it is possible that a release from the Evaporation Pond occurred starting in approximately 2011. Furthermore, the results of the geochemical model along with the general proximity and hydraulic position of MW-104 relative to the Evaporation Pond supports the hypothesis that the SSI for TDS and sulfate at MW-104 is due to a "source other than the CCR unit." Therefore, we accept the hypothesis that TDS and sulfate concentrations observed at MW-104 are consistent with a potential release from the Evaporation Pond, a non CCR unit.

4.0 Conclusions

Four SSIs were identified from the August 2021 detection monitoring event. This report demonstrates that a "source other than the CCR unit" caused the potential SSIs (natural variation in regional and/or prelandfill groundwater quality and the Evaporation Pond), as allowed by §257.94(e)(2). The results of this alternative source demonstration are summarized in the table below.

Table 3. Summary of SSIs and Alternative Sources

Well	Parameter	Report Section	Evidence for Alternative Source
MW-104	Sulfate	3.2.2, 3.3.1	Natural variability and/or Other (Evaporation Pond, a non CCR unit)
MW-104	Total Dissolved Solids 3.2.2, 3.3.1		Natural Variability and/or Other (Evaporation Pond, a non CCR unit)
MW-105	Chloride	3.2.1	Natural variability (pre-landfill values and geologic background)
MW-2-90	Fluoride	3.2.1	Natural variability (pre-landfill values and geologic background)

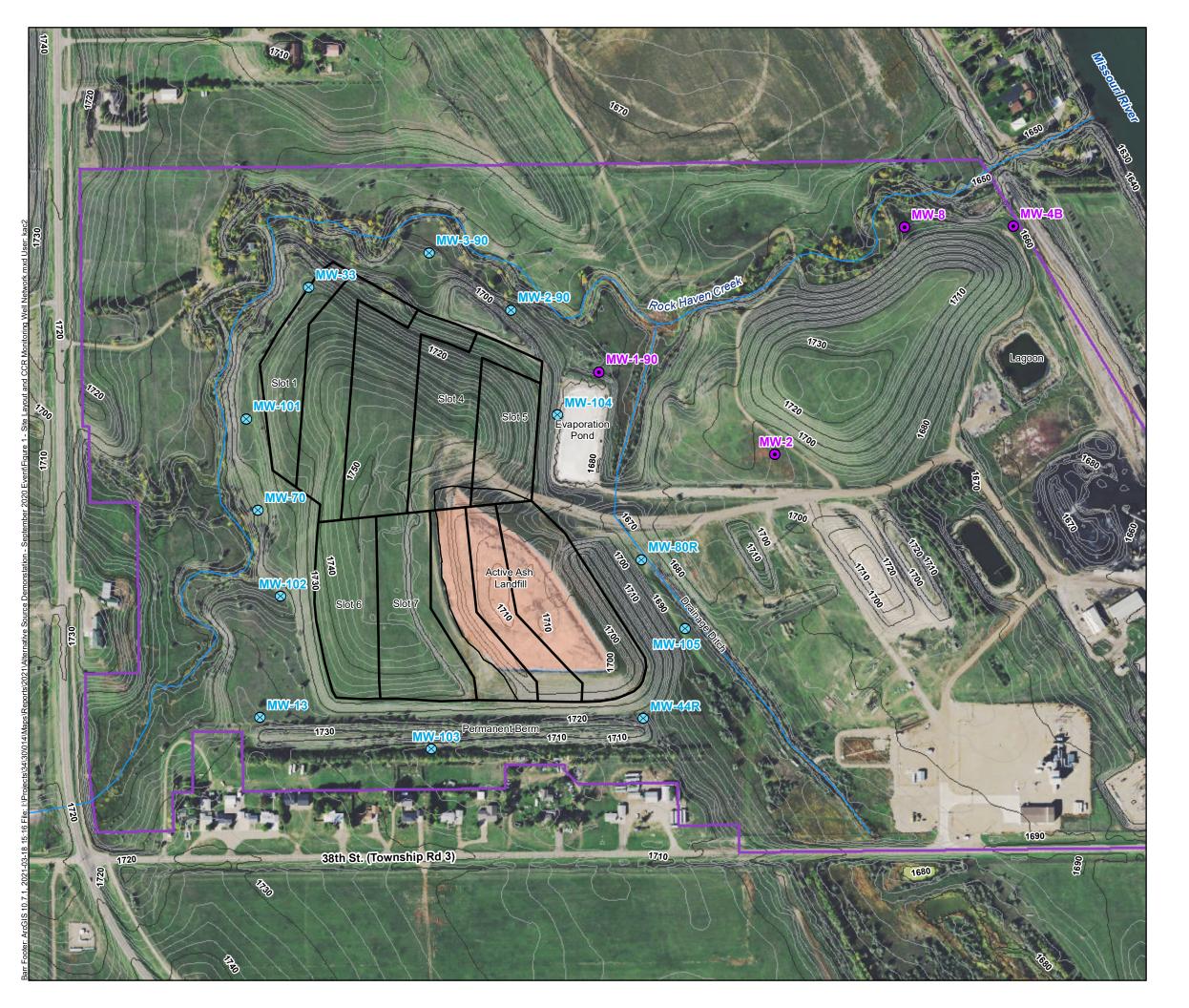
Based on the foregoing, the alternative source demonstration presented herein meets the requirements of CCR Rule §257.94(e)(2). As coal unit operations ended in early March 2022, MDU will work with the North Dakota Department of Environmental Quality (NDDEQ) on closure options for the Evaporation Pond as it is regulated under a permit through the NDDEQ.

5.0 References

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Figures





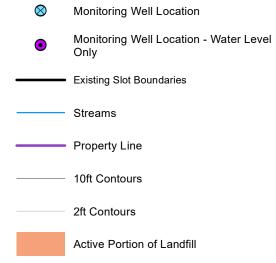
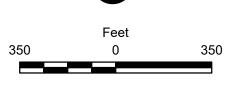


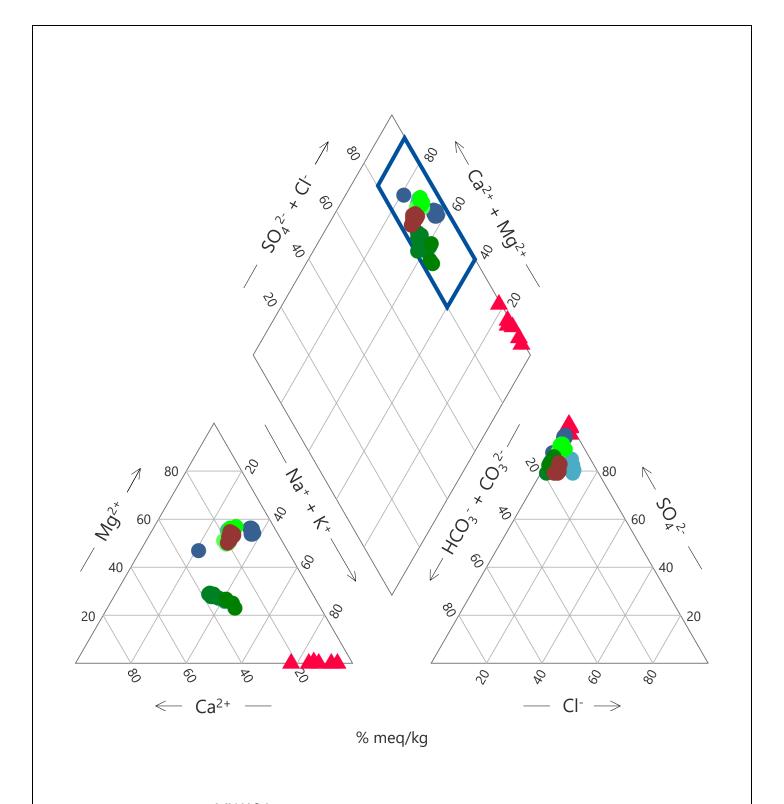
Image Source: 2021 Statewide Imagery (ND GIS Hub)

CAD Data Source: Slot Linework.dwg





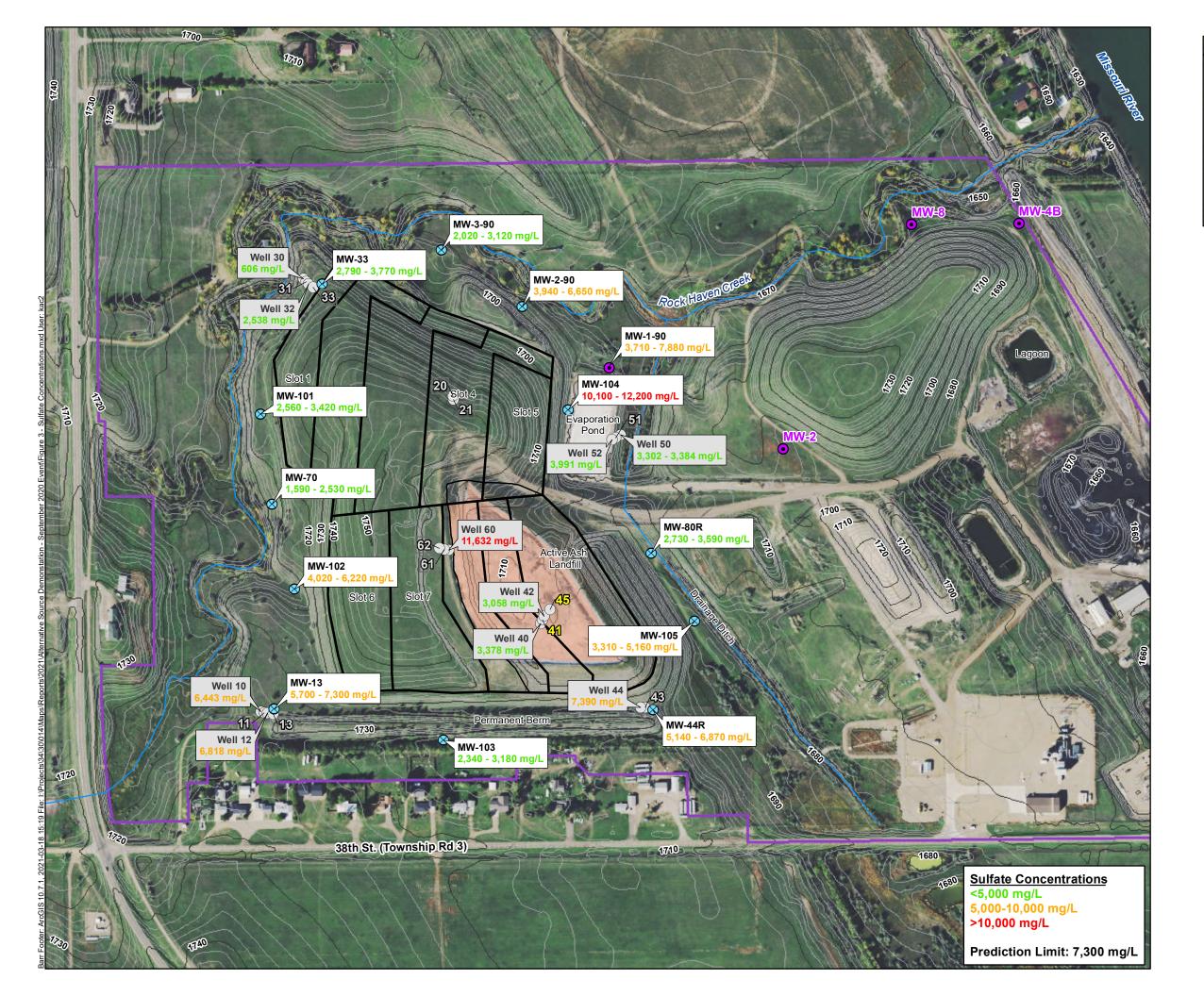
SITE LAYOUT AND CCR MONITORING WELL NETWORK R. M. Heskett Station Alternative Source Demonstration: August 2021 Event Montana Dakota Utilities Mandan, North Dakota



MW104

- MW105
- MW2-90
- MW3-90
- MW80R
- Upgradient
- ▲ Ash SPLP

Figure 2
PIPER PLOT
R.M. Heskett Station
Alternative Source Demonstration
August 2021 Event
Montana Dakota Utilities
Mandan, North Dakota





- Monitoring Well Location
- Monitoring Well Location Water Level Only
- Pre-Landfill Wells (Approximate)
- Existing Slot Boundaries
- Streams
- Property Line
- 10ft Contours
 - 2ft Contours
- Active Portion of Landfill

Image Source: 2021 Statewide Imagery (ND GIS Hub)

CAD Data Source: Slot Linework.dwg Pre-Landfill well concentrations are from 9/11/1986, 11/21/1986 (MDU, 1989), and CCR Rule monitoring well concentrations are from 2016-2019.

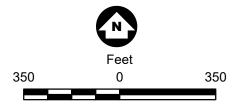
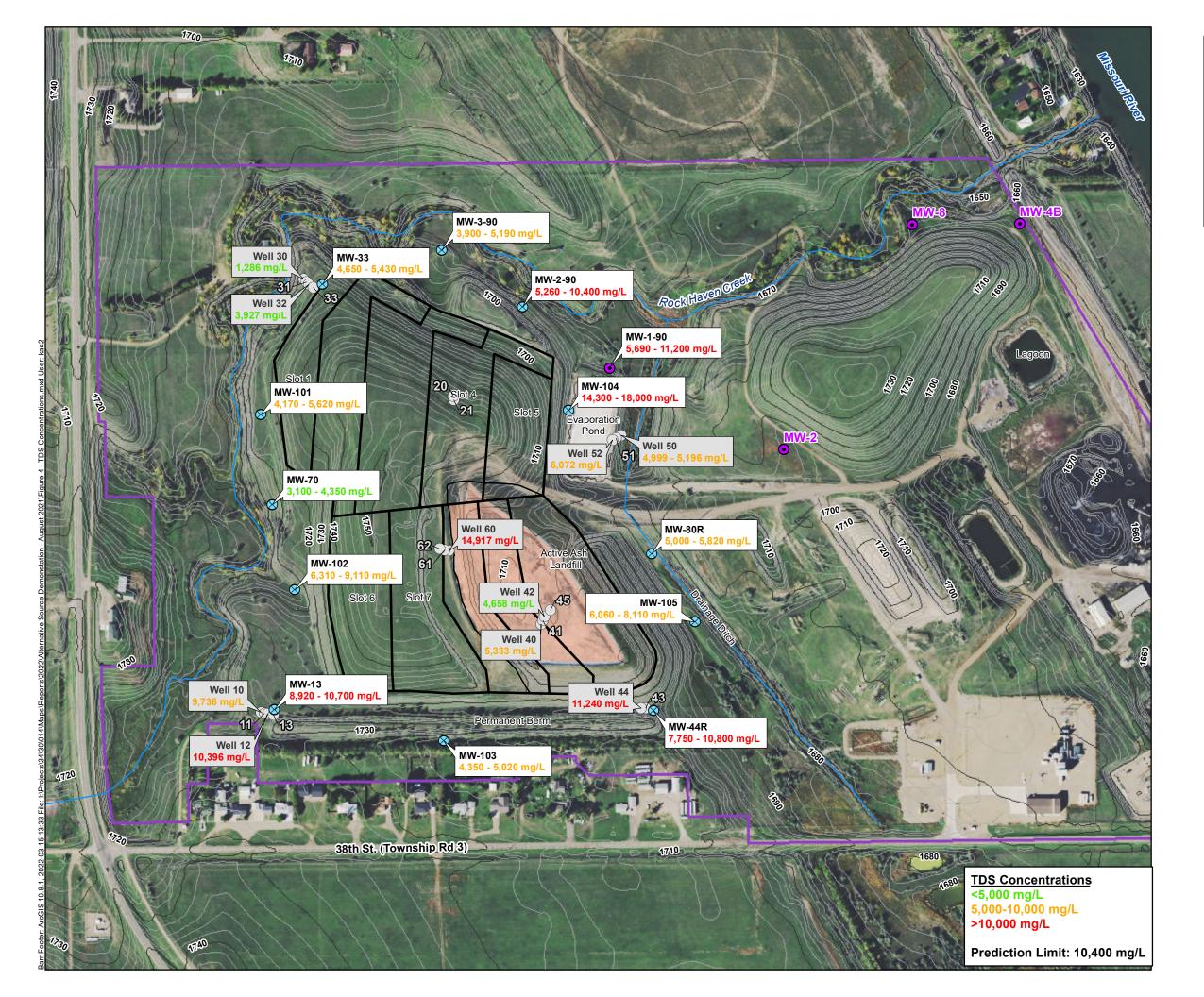




Figure 3

SULFATE CONCENTRATIONS
R. M. Heskett Station
Alternative Source Demonstration:
August 2021 Event
Montana Dakota Utilities
Mandan, North Dakota





- Monitoring Well Location
- Monitoring Well Location Water Level Only
- Pre-Landfill Wells (Approximate)
- Existing Slot Boundaries
- Streams
- Property Line
- 10ft Contours
- 2ft Contours
- Active Portion of Landfill

Image Source: 2021 Statewide Imagery (ND GIS Hub)

CAD Data Source: Slot Linework.dwg Pre-Landfill well concentrations are from 9/11/1986, 11/21/1986 (MDU, 1989), and CCR Rule monitoring well concentrations are from 2016-2019.

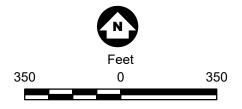




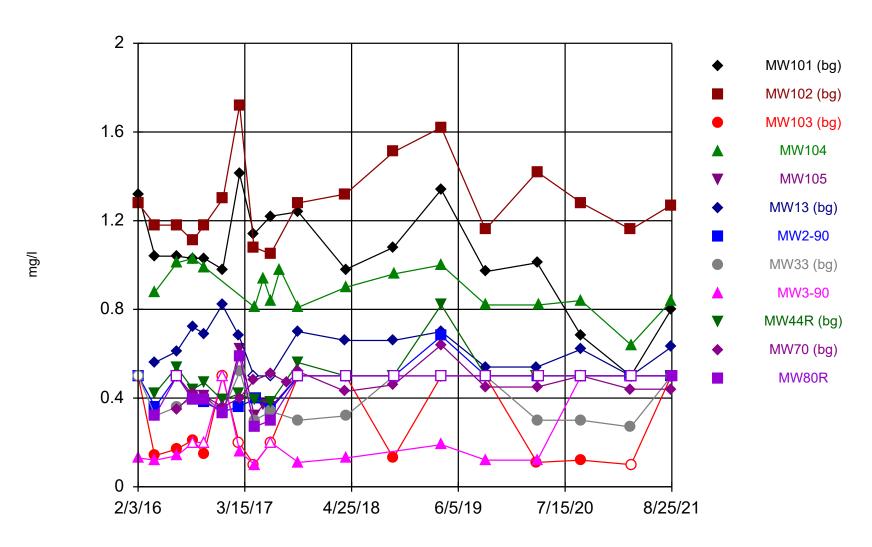
Figure 4

TDS CONCENTRATIONS
R. M. Heskett Station
Alternative Source Demonstration:
August 2021 Event
Montana Dakota Utilities
Mandan, North Dakota

Appendix A

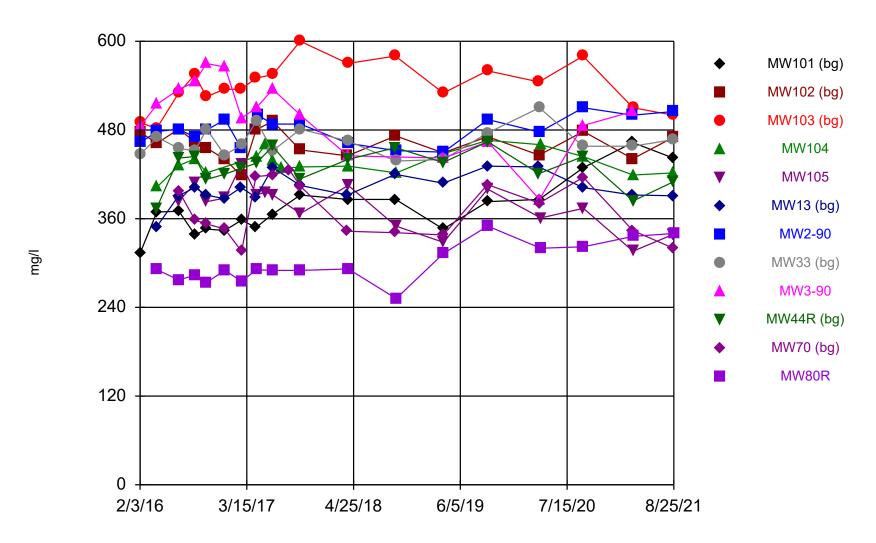
Appendix III Time Series Plots

Boron, total



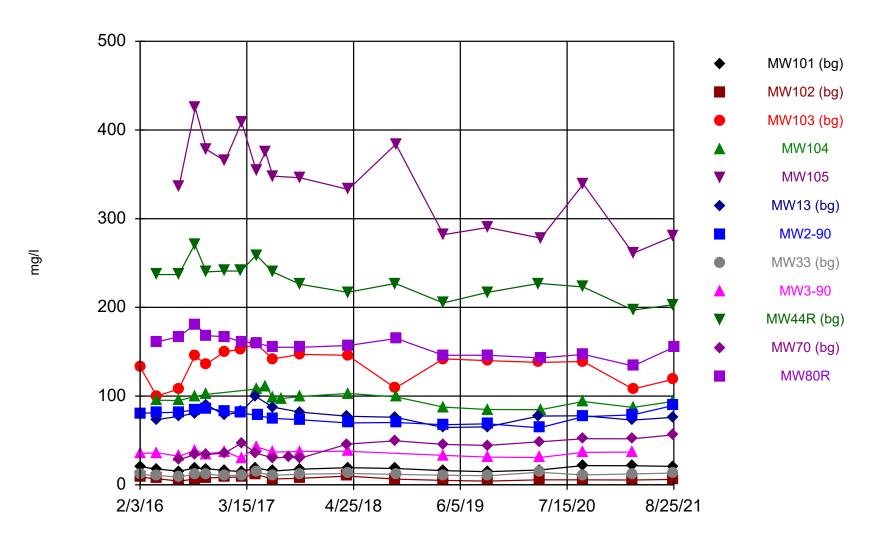
Time Series Analysis Run 12/15/2021 12:45 PM

Calcium, Total



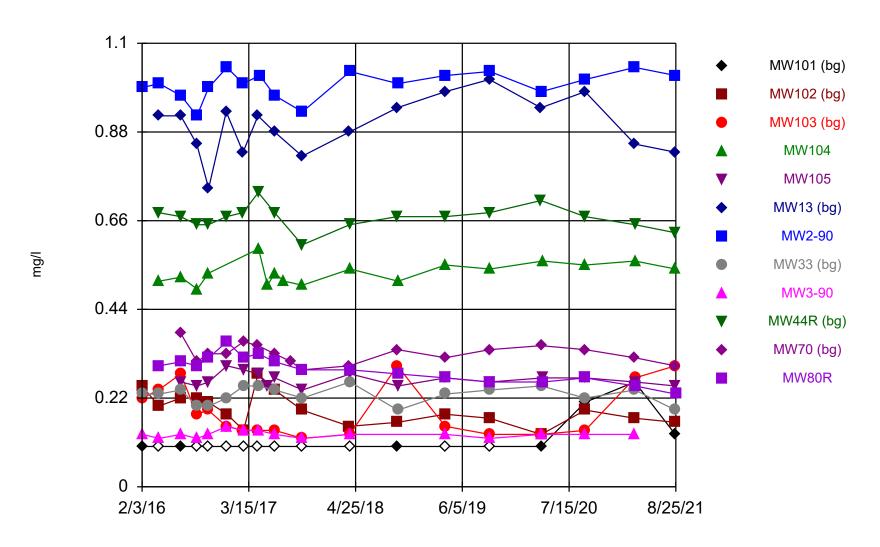
Time Series Analysis Run 12/15/2021 12:45 PM

Chloride



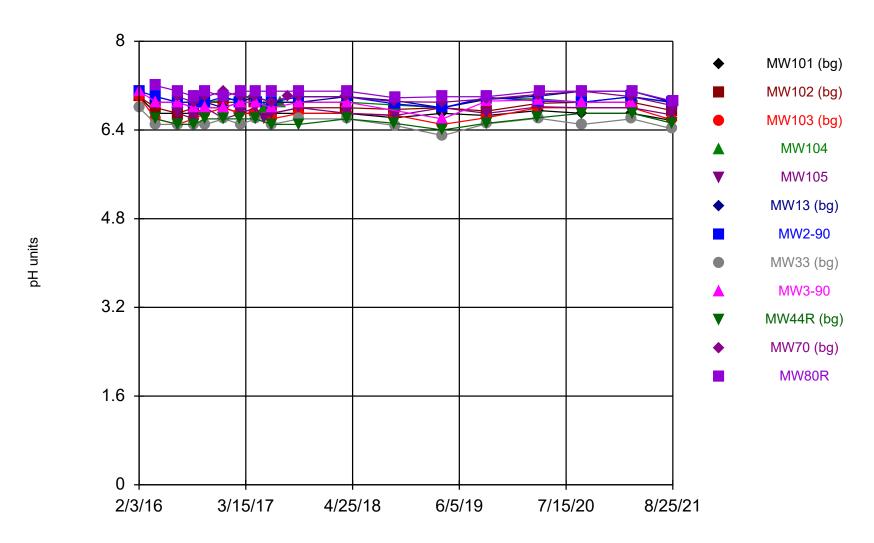
Time Series Analysis Run 12/15/2021 12:45 PM

Fluoride



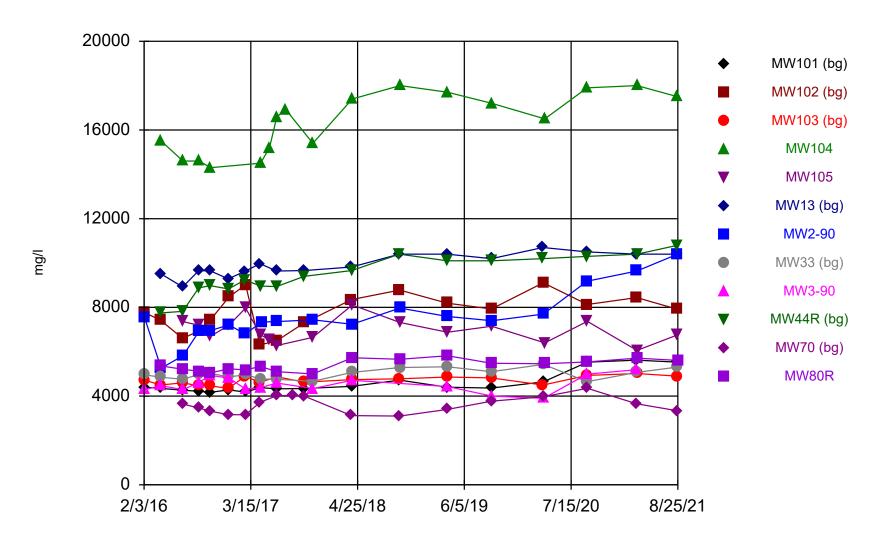
Time Series Analysis Run 12/15/2021 12:45 PM

pH, Field



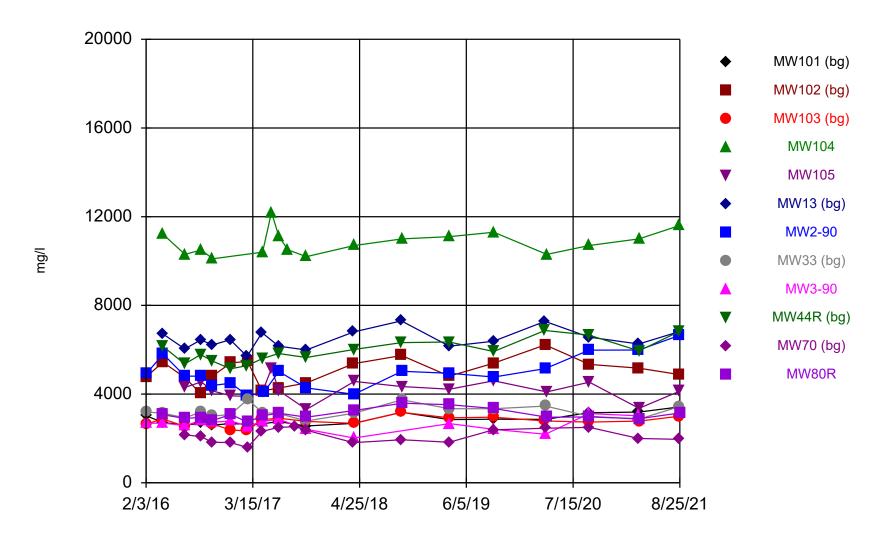
Time Series Analysis Run 12/15/2021 12:45 PM

Solids, total dissolved



Time Series Analysis Run 12/15/2021 12:45 PM

Sulfate, as SO4



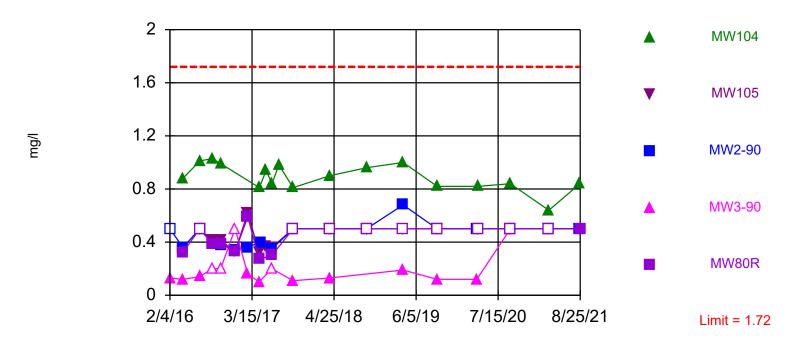
Time Series Analysis Run 12/15/2021 12:46 PM

Appendix B

August 2021 Prediction Limit Plots

Within Limit Boron, total

Interwell Non-parametric

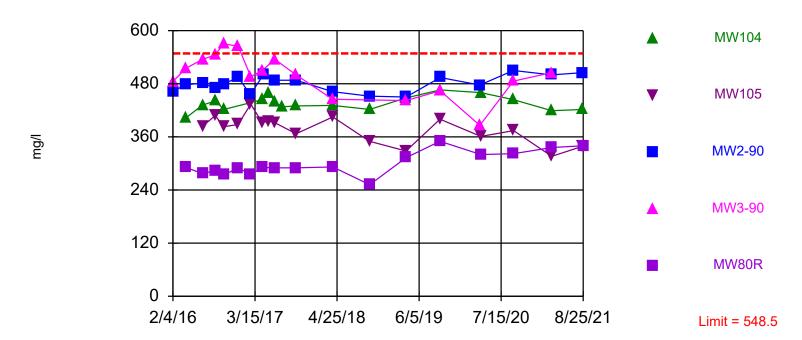


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 88 background values. 17.05% NDs. Annual perconstituent alpha = 0.002497. Individual comparison alpha = 0.00025 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:55 AM

Within Limit

Calcium, Total Interwell Parametric

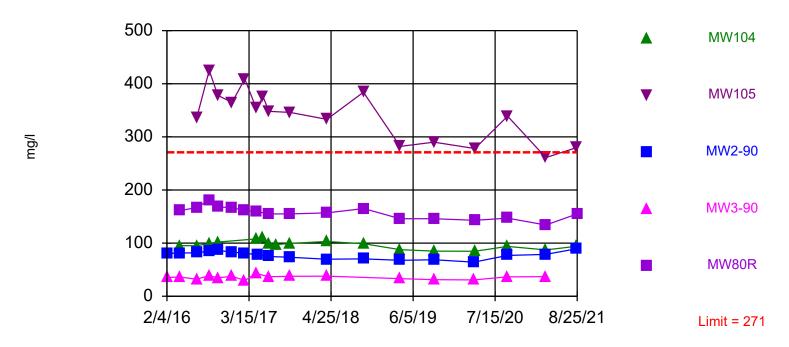


Background Data Summary: Mean=432.4, Std. Dev.=64.15, n=88. Seasonality was not detected with 95% confidence. Normality test: Shapiro Francia @alpha = 0.05, calculated = 0.9786, critical = 0.972. Kappa = 1.81 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Prediction Limit Analysis Run 12/15/2021 10:55 AM

Exceeds Limit: MW105 Chloride

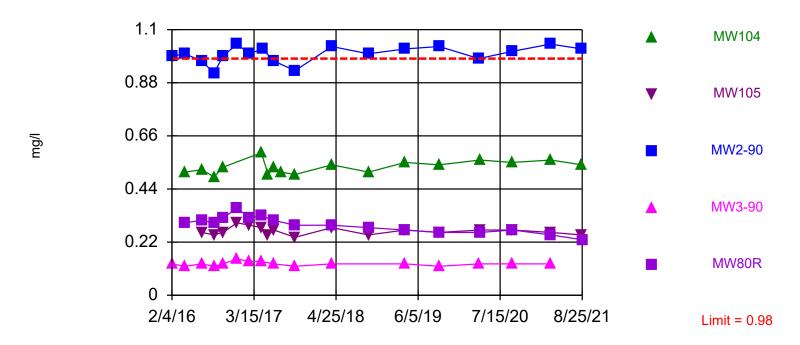
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 88 background values. Annual per-constituent alpha = 0.002497. Individual comparison alpha = 0.00025 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:55 AM

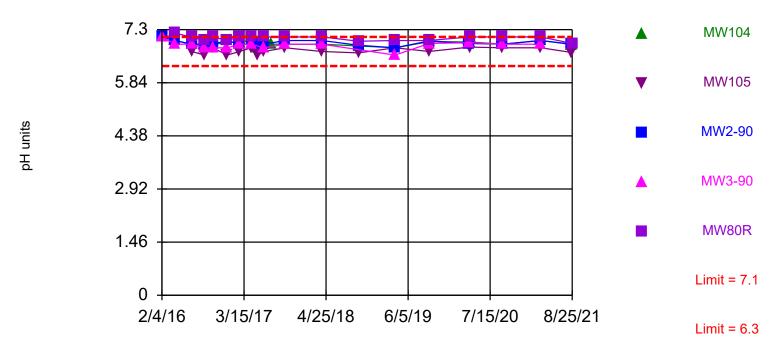
Exceeds Limit: MW2-90 Fluoride
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 88 background values. 11.36% NDs. Annual perconstituent alpha = 0.002497. Individual comparison alpha = 0.00025 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:56 AM

Within Limits pH, Field
Interwell Non-parametric

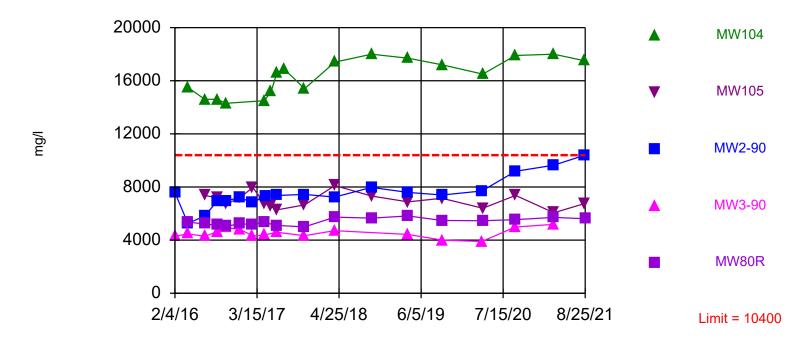


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 88 background values. Annual perconstituent alpha = 0.004994. Individual comparison alpha = 0.0004999 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:56 AM

Exceeds Limit: MW104

Solids, total dissolved Interwell Non-parametric

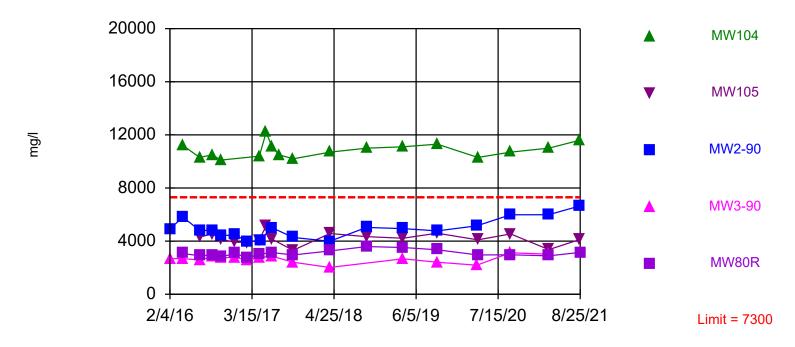


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 84 background values. Annual per-constituent alpha = 0.002742. Individual comparison alpha = 0.0002746 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:56 AM

Exceeds Limit: MW104 Sulfate, as SO4

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 88 background values. Annual per-constituent alpha = 0.002497. Individual comparison alpha = 0.00025 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/15/2021 10:56 AM

Prediction Limit

	R.M.	Heskett Station	Client: Montana-	Dakota Utilities C	co. Data: H	eskett_S	anitasA _l	opIII Prin	ted 12/15/2021, 11:0	2 AM	
<u>Constituent</u>	<u>Well</u>	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	Sig.	Bg N	%NDs	<u>Transform</u>	<u>Alpha</u>	Method
Boron, total (mg/l)	MW104	1.72	n/a	8/24/2021	0.84	No	88	17.05	n/a	0.00025	NP Inter (normality)
Boron, total (mg/l)	MW105	1.72	n/a	8/24/2021	0.5	No	88	17.05	n/a	0.00025	NP Inter (normality)
Boron, total (mg/l)	MW2-90	1.72	n/a	8/24/2021	0.5	No	88	17.05	n/a	0.00025	NP Inter (normality)
Boron, total (mg/l)	MW3-90	1.72	n/a	3/22/2021	0.5ND	No	88	17.05	n/a	0.00025	NP Inter (normality)
Boron, total (mg/l)	MW80R	1.72	n/a	8/25/2021	0.5	No	88	17.05	n/a	0.00025	NP Inter (normality)
Calcium, Total (mg/l)	MW104	548.5	n/a	8/24/2021	422	No	88	0	No	0.001504	Param Inter 1 of 2
Calcium, Total (mg/l)	MW105	548.5	n/a	8/24/2021	339	No	88	0	No	0.001504	Param Inter 1 of 2
Calcium, Total (mg/l)	MW2-90	548.5	n/a	8/24/2021	505	No	88	0	No	0.001504	Param Inter 1 of 2
Calcium, Total (mg/l)	MW3-90	548.5	n/a	3/22/2021	505	No	88	0	No	0.001504	Param Inter 1 of 2
Calcium, Total (mg/l)	MW80R	548.5	n/a	8/25/2021	340	No	88	0	No	0.001504	Param Inter 1 of 2
Chloride (mg/l)	MW104	271	n/a	8/24/2021	94.1	No	88	0	n/a	0.00025	NP Inter (normality)
Chloride (mg/l)	MW105	271	n/a	8/24/2021	280	Yes	88	0	n/a	0.00025	NP Inter (normality)
Chloride (mg/l)	MW2-90	271	n/a	8/24/2021	89.5	No	88	0	n/a	0.00025	NP Inter (normality)
Chloride (mg/l)	MW3-90	271	n/a	3/22/2021	36.9	No	88	0	n/a	0.00025	NP Inter (normality)
Chloride (mg/l)	MW80R	271	n/a	8/25/2021	155	No	88	0	n/a	0.00025	NP Inter (normality)
Fluoride (mg/l)	MW104	0.98	n/a	8/24/2021	0.54	No	88	11.36	n/a	0.00025	NP Inter (normality)
Fluoride (mg/l)	MW105	0.98	n/a	8/24/2021	0.25	No	88	11.36	n/a	0.00025	NP Inter (normality)
Fluoride (mg/l)	MW2-90	0.98	n/a	8/24/2021	1.02	Yes	88	11.36	n/a	0.00025	NP Inter (normality)
Fluoride (mg/l)	MW3-90	0.98	n/a	3/22/2021	0.13	No	88	11.36	n/a	0.00025	NP Inter (normality)
Fluoride (mg/l)	MW80R	0.98	n/a	8/25/2021	0.23	No	88	11.36	n/a	0.00025	NP Inter (normality)
pH, Field (pH units)	MW104	7.1	6.3	8/24/2021	6.89	No	88	0	n/a	0.000	NP Inter (normality)
pH, Field (pH units)	MW105	7.1	6.3	8/24/2021	6.67	No	88	0	n/a	0.000	NP Inter (normality)
pH, Field (pH units)	MW2-90	7.1	6.3	8/24/2021	6.9	No	88	0	n/a	0.000	NP Inter (normality)
pH, Field (pH units)	MW3-90	7.1	6.3	3/22/2021	6.9	No	88	0	n/a	0.000	NP Inter (normality)
pH, Field (pH units)	MW80R	7.1	6.3	8/25/2021	6.92	No	88	0	n/a	0.000	NP Inter (normality)
Solids, total dissolved (mg/l)	MW104	10400	<mark>n/a</mark>	8/24/2021	17500	Yes	84	0	<mark>n/a</mark>	0.000	NP Inter (normality)
Solids, total dissolved (mg/l)	MW105	10400	n/a	8/24/2021	6760	No	84	0	n/a	0.000	NP Inter (normality)
Solids, total dissolved (mg/l)	MW2-90	10400	n/a	8/24/2021	10400	No	84	0	n/a	0.000	NP Inter (normality)
Solids, total dissolved (mg/l)	MW3-90	10400	n/a	3/22/2021	5190	No	84	0	n/a	0.000	NP Inter (normality)
Solids, total dissolved (mg/l)	MW80R	10400	n/a	8/25/2021	5610	No	84	0	n/a	0.000	NP Inter (normality)
Sulfate, as SO4 (mg/l)	MW104	7300	<mark>n/a</mark>	8/24/2021	11600	Yes	88	0	<mark>n/a</mark>	0.00025	NP Inter (normality)
Sulfate, as SO4 (mg/l)	MW105	7300	n/a	8/24/2021	4130	No	88	0	n/a	0.00025	NP Inter (normality)
Sulfate, as SO4 (mg/l)	MW2-90	7300	n/a	8/24/2021	6650	No	88	0	n/a	0.00025	NP Inter (normality)
Sulfate, as SO4 (mg/l)	MW3-90	7300	n/a	3/22/2021	3020	No	88	0	n/a	0.00025	NP Inter (normality)
Sulfate, as SO4 (mg/l)	MW80R	7300	n/a	8/25/2021	3150	No	88	0	n/a	0.00025	NP Inter (normality)

Appendix C

Ash SPLP Laboratory Report (2011)



1126 North Front 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 51 West Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



Page: 1 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
На	12.2	units	N/A	SM4500 H+ B	22 Jul 11 17:0	
Specific Conductance	8778	umhos/cm	N/A	SM2510-B	22 Jul 11 17:0	
Total Suspended Solids	3	mg/l	1	SM2540-D	22 Jul 11 14:0	
Total Alkalinity	1120	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Phenolphthalein Alk	1090	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Carbonate	60	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Hydroxide	1060	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:0	
Tot Dis Solids (Summation)	4860	mg/l	NA	SM1030-F	3 Aug 11 8:4	
Total Hardness as CaCO3	524	mg/l	NA	SM2340-B	3 Aug 11 8:4	
Hardness in grains/gallon	30.7	gr/gal	NA	SM2340-B	3 Aug 11 8:4	
Cation Summation	74.3	${ t meq/L}$	NA	SM1030-F	3 Aug 11 8:4	
Anion Summation	74.6	meq/L	NA	SM1030-F	28 Jul 11 14:3	
Percent Error	-0.24	8	NA	SM1030-F	3 Aug 11 8:4	
Sodium Adsorption Ratio	27.1		NA	USDA 20b	3 Aug 11 8:4	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:0	
Radon 222	Attached				28 Jul 11 4:3	
Radium 226	Attached	pCi/l			22 Aug 11 22:2	
Radium 228	Attached	pCi/l			16 Aug 11 16:5	
Total Organic Carbon	0.7	mg/l	0.5	SM5310-C	1 Aug 11 8:0	
Fluoride	< 0.1	mg/1	0.10	SM4500-F-C	4 Aug 11 17:0	
Sulfate	2440	mg/l	5.00	ASTM D516-02	27 Jul 11 9:0	
Chloride	50.5	mg/1	1.0	SM4500-C1-E	27 Jul 11 14:0	
Nitrate-Nitrite as N	0.21	mg/l	0.10	EPA 353.2	28 Jul 11 14:3	
Ammonia-Nitrogen as N	0.32	mg/1	0.10	EPA 350.1	28 Jul 11 10:4	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:0	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:0	
Chemical Oxygen Demand	< 5	mg/l	5,0	HACH 8000	1 Aug 11 8:3	
Calcium - Total	210	mg/l	1.0	6010	3 Aug 11 8:4	-
Magnesium - Total	< 2.5	mg/l	1.0	6010	3 Aug 11 8:4	-
Sodium - Total	1440	mg/l	1.0	6010	3 Aug 11 8:4 3 Aug 11 8:4	4
Potassium - Total	44.8	mg/l	1.0	6010		•
Aluminum - Total	< 0.5	mg/l	0.10	6010	- 3	-
Iron - Total	< 0.5	mg/l	0.10	6010	_	4
Strontium - Total	28.2	mg/l	0.10	6010	2 Aug 11 9:3	
Titanium - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:3	-
Boron - Total	< 0.5	mg/l	0.10	6010	11 Aug 11 8;4	0 Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity</pre>

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Duane Leingang Montana Dakota Utilities

PO Box 40

Mandan ND 58554

Page: 2 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0044	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.1135	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00164	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0065	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.0213	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0027	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.6860	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0074	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0133	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0189	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0151	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Page:

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Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
pH	11.1	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	20110	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	21	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	203	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Phenolphthalein Alk	171	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	64	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Hydroxide	139	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	Claudette
Tot Dis Solids (Summation)	22500	mg/l	NA	SM1030-F	3 Aug 11 8:40	Calculated
Total Hardness as CaCO3	1200	mg/l	NA	SM2340-B	3 Aug 11 8:40	Calculated
Hardness in grains/gallon	70.2	gr/gal	NA	SM2340-B	3 Aug 11 8:40	Calculated
Cation Summation	318	meg/L	NA	SM1030-F	3 Aug 11 8:40	Calculated
Anion Summation	314	meg/L	NA	SM1030-F	28 Jul 11 14:30	Calculated
Percent Error	0.65	8	NA	SM1030-F	3 Aug 11 8:40	Calculated
Sodium Adsorption Ratio	80.9		NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	See Attacl	ned			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	< 0.5	mg/l	0 , 5	SM5310-C	1 Aug 11 8:00	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	
Sulfate	14900	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	KMP
Chloride	2.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	KMP
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	KMP
Ammonia-Nitrogen as N	0.10	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	KMP
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	KMP
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30	Wayne
Calcium - Total	481	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	6500	mg/l	1 . 0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	459	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	1.09	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 1	mg/1	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	66.0	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	5.96	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receive Result	ed.	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0822	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0,0930	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00182	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0244	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mq/1	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.1108	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0052	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.1000	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0136	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0937	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.3026	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0327	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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PO Box 40

Mandan ND 58554

Page: 1 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed Analyst		Analyst
SPLP Extraction				1312	22 Jul 11 SS	22 Jul 11	SS
рн	12.9	units	N/A	SM4500 H+ B	22 Jul 11 17:00 Claudette	22 Jul 11	Claudette
Specific Conductance	50660	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00 Claudette	22 Jul 11	Claudette
Total Suspended Solids	30	mg/l	1	SM2540-D	22 Jul 11 14:00 CLB	22 Jul 11	CLB
Total Alkalinity	7020	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00 Claudette	25 Jul 11	Claudette
Phenolphthalein Alk	6900	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00 Claudette	25 Jul 11	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00 Claudette	25 Jul 11	Claudette
Carbonate	240	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00 Claudette	25 Jul 11	
Hydroxide	6780	mg/l CaCO3	0	SM2320-B	25 Jul 11 17:00 Claudette	25 Jul 11	Claudette
Tot Dis Solids (Summation)	42200	mg/l	NA	SM1030-F	3 Aug 11 8:40 Calculate	3 Aug 11	Calculated
Total Hardness as CaCO3	1750	mg/l	NA	SM2340-B		3 Aug 11	Calculated
Hardness in grains/gallon	102	gr/gal	NA	SM2340-B	3 Aug 11 8:40 Calculate	3 Aug 11	Calculated
Cation Summation	663	meg/L	NA	SM1030-F		3 Aug 11	Calculated
Anion Summation	613	meg/L	NA	SM1030-F	28 Jul 11 14:30 Calculate	28 Jul 11	Calculated
Percent Error	3.99	8	NA	SM1030-F	÷	3 Aug 11	Calculated
Sodium Adsorption Ratio	143		NA	USDA 20b	3 Aug 11 8:40 Calculate	3 Aug 11	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	22 Aug 11	
Radon 222	Attached	2 - /			28 Jul 11 4:37		
Radium 226	Attached	pCi/l			22 Aug 11 22:20	22 Aug 11	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	16 Aug 11	
Total Organic Carbon	1.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00 Eric	1 Aug 11	
Fluoride	5.60	mg/l	0.10	SM4500-F-C	10 Aug 11 17:00 CLB	10 Aug 11	
Sulfate	22600	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00 KMP		
Chloride	53.8	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:00 KMP	27 Jul 11	KMP
Nitrate-Nitrite as N	0.68	mg/l	0.10	EPA 353.2	28 Jul 11 14:30 KMP	28 Jul 11	KMP
Ammonia-Nitrogen as N	7.22	mq/l	0.10	EPA 350.1	28 Jul 11 10:45 KMP	28 Jul 11	KMP
Phosphorus as P - Total	< 0.1	mq/l	0.10	EPA 365.1	28 Jul 11 13:00 KMP	28 Jul 11	KMP
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00 Eric	28 Jul 11	Eric
Chemical Oxygen Demand	22.4	mg/1	5.0	HACH 8000	1 Aug 11 8:30 Wayne	1 Aug 11	Wayne
Calcium - Total	700	mq/l	1.0	6010	3 Aug 11 8:40 Stacy	3 Aug 11	Stacy
Magnesium - Total	< 25	mg/l	1.0	6010	3 Aug 11 8:40 Stacy	3 Aug 11	Stacy
Sodium - Total	14100	mg/l	1.0	6010	3 Aug 11 8:40 Stacy	3 Aug 11	Stacy
Potassium - Total	580	mg/1	1.0	6010	3 Aug 11 8:40 Stacy	3 Aug 11	Stacy
Aluminum - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30 Stacy	2 Aug 11	Stacy
Iron - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30 Stacy	2 Aug 11	Stacy
Strontium - Total	59.5	mg/l	0.10	6010	2 Aug 11 9:30 Stacy	2 Aug 11	Stacy
Titanium - Total	< 5	mg/1	0.10	6010	2 Aug 11 9:30 Stacy	2 Aug 11	Stacy
Boron - Total	1.89	mg/l	0.10	6010	11 Aug 11 8:40 Stacy	11 Aug 11	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

Due to sample concentration
+ Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.1128	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0906	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00244	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0270	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.2934	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	0.0161	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0102	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.9246	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0175	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.1959	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0158	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.3984	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix $\frac{1}{2}$ = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2453 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Fly Ash

Sample Site: MDU Heskett

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
Н	12.8	units	N/A	SM4500 H+ B	22 Jul 11 17:0	
Specific Conductance	27240	umhos/cm	N/A	SM2510-B	22 Jul 11 17:0	0 Claudette
Total Suspended Solids	13	mg/l	1	SM2540-D	22 Jul 11 14:0	
Total Alkalinity	4570	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Phenolphthalein Alk	4520	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Carbonate	100	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:0	
Hydroxide	4470	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:0	
Tot Dis Solids (Summation)	16000	mg/l	NA	SM1030-F	3 Aug 11 8:4	
Total Hardness as CaCO3	1960	mg/l	NA	SM2340-B	3 Aug 11 8:4	
Hardness in grains/gallon	115	gr/gal	NA	SM2340-B	3 Aug 11 8:4	
Cation Summation	252	meq/L	NA	SM1030-F	9 Aug 11 9:0	
Anion Summation	247	meq/L	NA	SM1030-F	28 Jul 11 14:1	
Percent Error	1.00	age of the second	NA	SM1030-F	9 Aug 11 9:0	
Sodium Adsorption Ratio	46.1		NA	USDA 20b	3 Aug 11 8:4	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:0	
Radon 222	Attached				28 Jul 11 4:3	
Radium 226	Attached	pCi/l			22 Aug 11 22:2	
Radium 228	Attached	pCi/l			16 Aug 11 16:5	
Total Organic Carbon	1.6	mg/l	0.5	SM5310-C	1 Aug 11 8:0	
Fluoride	3.60	mg/1	0.10	SM4500-F-C	4 Aug 11 17:0	
Sulfate	7400	mg/l	5.00	ASTM D516-02	27 Jul 11 9:0	
Chloride	66.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:0	
Nitrate-Nitrite as N	0.38	mg/1	010	EPA 353.2	28 Jul 11 14:	
Ammonia-Nitrogen as N	15.0	mg/l	0.10	EPA 350.1	28 Jul 11 10:4	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:0	
Chemical Oxygen Demand	9.4	mg/l	5.0	HACH 8000	1 Aug 11 8:	4
Calcium - Total	785	mg/l	1.0	6010	3 Aug 11 8:4	
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:4	4
Sodium - Total	4720	mg/l	1.0	6010	3 Aug 11 8:	4
Potassium - Total	275	mg/l	1.0	6010	3 Aug 11 8:	4
Aluminum - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:	
Iron - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:	
Strontium - Total	85.0	mg/l	0.10	6010	9 Aug 11 9:	4
Titanium - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:	4
Boron - Total	< 1	mg/l	0.10	6010	11 Aug 11 8:	0 Stacy

RL = Method Reporting Limit

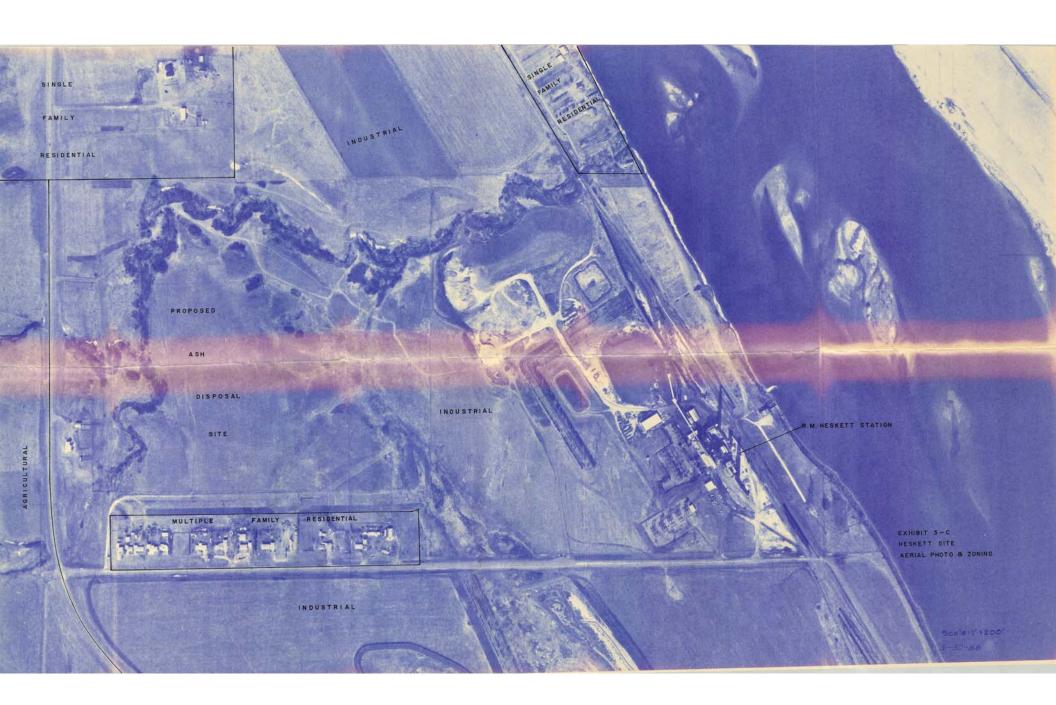
Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration + = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

Appendix D

Aerial Photo (March 30, 1988)



Appendix E Boring Logs

EXHIBIT 5-E

LITHOLOGIC LOGS

- Wells 10, 11, 12 and 13

 O-1 Top soil, silty, clayey, sandy, brown, calcareous; with some limestone pebbles.
- 1-11 Silt, clayey, brownish-tan, slightly indurated, very dry, calcareous; with thin coarse-grained, clean silt lenses and a few small (less than .5 in.) iron oxide concretions. Abundant small gypsum crystals (less than .13 in. long). Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- Silt, as above, with some (less than 20%) very fine- to fine-grained sand interspersed.
- 14-30 Silt, as above, clayey, less sand than above interval, oxidized; with very fine-grained silty sand lenses and very few gypsum crystals.
- 30-41 Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with fewer small gypsum crystals than above intervals.
- Silt, as above, very clayey, with some (less than 20%) fine- to medium-grained sand interspersed in a silt and clay matrix.
- 59-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- Silt, clayey, steel-gray to bluish, moderately indurated; with thin coarse-grained silt to very fine-grained sand lenses in an otherwise fine silt to clay matrix.
- 81-84 Clay, silty, steel-gray to bluish, moderately indurated, dense.
- Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- 91-110 Silt, clayey, bluish-gray, moderately indurated; with thin (less than 1 foot) mudstone lenses.
- 110-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.

Wells 20 and 21

- 0-1 Top soil, silty, sandy, clayey, dark-brown, calcareous; with some limestone and granite pebbles.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- 21-26 Silt, as above, steel-gray (color change).
- Silt, clayey, with some (less than 20%) very fine- to medium-grained sand interspersed, steel-gray to bluish, slightly indurated; with very few small gypsum crystals and some thin (less than 1 foot) siltstone lenses.
- 49-53 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 53-63 Silt, as above, clayey, less sand, with thin (less than 1 foot) siltstone to mudstone lenses.
- Silt, very clayey, steel-gray to bluish, moderately indurated, very dense.
 Cannonball-Ludlow Formations.

Wells 30, 31, 32 and 33

- 0-1 Top soil, silty, sandy, brownish, calcareous; with some granite and limestone pebbles.
- 1-2 Pebble-loam (glacial till), silty, sandy, clayey, yellowish-brown, dry, calcareous.
- 2-31 Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions.

 Some small, black flakes organic plant material. Cannonball-Ludlow Formations.
- Silt, clayey, steel-gray (color change), slightly indurated, calcareous; with small iron oxide concretions, thin coarse silt lenses, small gypsum crystals and gray to reddish-brown mottling.

- Silt, as above, with some (less than 20%) fineto medium-grained sand interspersed.
- 61-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed, dense.
- Silt, as above, clayey, less sand, some thin (less than 1 foot) lenses of siltstone to mudstone.
- 76-80 Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) fine-grained sand interspersed in the matrix.
- 80-92 Silt, clayey, steel-gray to bluish, moderately indurated, with some (less than 20%) very fine- to fine grained sand interspersed.
- 92-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.
- Well 40
 0-1
 Top soil, sandy, silty, brownish-tan, calcareous; with some granite and limestone pebbles.
- Pebble-loam (glacial till), sandy, silty, with detrital lignite and organic matter, yellowish-brown, very dry, calcareous.
- 5-22 Sand, very fine- to medium-grained, unconsolidated, with thin lenses of clay and detrital lignite, brownish-yellow, calcareous.
- 22-40 Silt, clayey, with minor amounts (less than 10%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and small gypsum crystals; Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.

- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.
- 70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.
- 80-120 Silt, as above, dark-steel-gray. Cannonball-Ludlow Formations.

Wells 41, 42 and 43

- Top soil, sandy, silty, dark-brown, calcareous; with some granite and limestone pebbles.
- Pebble-loam (glacial till), sandy, silty, clayey, yellowish-brown, very dry, calcareous.
- Silt, clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, unconsolidated, noncompacted, calcareous to 25 feet, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.
- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.

70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.

Wells 43 and 44

- O-2 Top soil, clayey, silty, some sand, brownish-tan to light-gray, calcareous.
- 2-20 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, slightly indurated, very dry, calcareous; with small iron oxide concretions, abundant small gypsum crystals and occasional thin silt lenses. Cannonball-Ludlow Formations.
- 20-25 Silt, as above, very clayey, oxidized, with minor amounts (less than 10%) of fine-grained sand.
- 25-35 Silt, as above, dark-brownish-tan to bluish-gray (color change), with thin very fine-grained sand lenses.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with some indurated silty sand lenses. Cannonball-Ludlow Formations.

Wells 50, 51 and 52 0-4 Top soil, clayey, silty, very dark-brown.

- 4-10 Clay, silty, with some (less than 20%) fine-grained sand, dark-brownish-tan, soft, cohesive, wet, sticky; with some pebbles.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, dense; with abundant small gypsum crystals and very thin silt and sand lenses; Cannonball-Ludlow Formations.
- 22-23 Sandstone, fine-grained, silty, indurated, oxidized, dark-brown.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin medium grained sand lenses.

30-40 Silt, as above, very clayey, less sand than above interval, dark-steel-gray. Cannonball-Ludlow Formations.

Wells 53 and 54 0-4 Top soil, clayey, silty, very dark-brown, wet, sticky.

- 4-15 Clay, silty, with some (less than 20%) fine- to medium-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional reddish-brown mottling; Cannonball-Ludlow Formations.
- Sand, very fine-grained to medium-grained, silty, clayey, unconsolidated, yellowish-brown, oxidized.
- 20-30 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, steel-gray (color change), slightly indurated; with clay and sand lenses, some small concretions and some small gypsum crystals.
- 30-45 Silt, as above, very clayey.
- 45-60 Silt, as above, clayey, brownish-gray, moderately indurated, some reddish-brown mottling.
 Cannonball-Ludlow Formations.

Wells 55 and 56

- O-5 Sandy-loam (glacial), with fine- to medium-grained sand, silty, calcareous; with small granite and limestone pebbles.
- Clay, silty, with minor amounts (less than 10%) of very fine-grained sand, dark-brownish-tan, moderately indurated, brittle, very dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional thin sandstone laminae. Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- 26-35 Clay, as above, very silty, sandy, brownish-tan, oxidized.

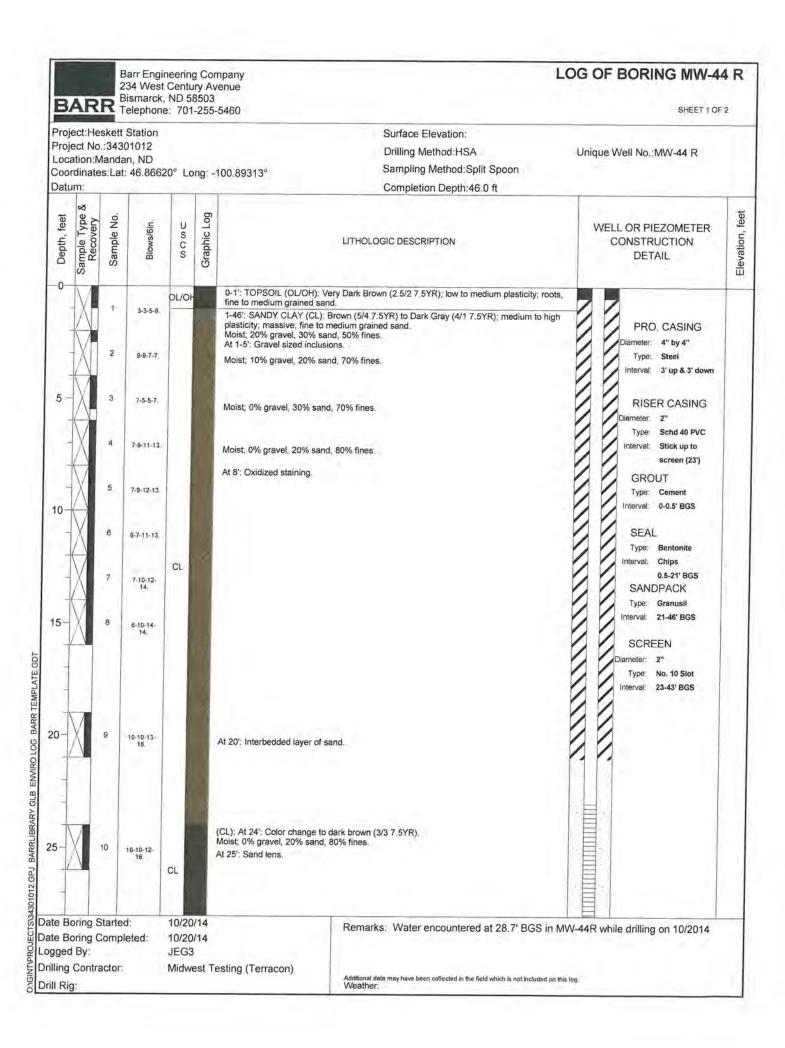
- Silt, clayey, with some (less than 20%) very fine- to fine-grained sand interspersed, steel-gray (color change) moderately indurated; with small gypsum crystals and occasional clay lenses.
- Silt, as above, with minor amounts (less than 10%) of fine-grained sand interspersed.
- 60-85 Silt, as above, clayey, less sand than above interval.
- 85-100 Silt, as above, very clayey, with minor amounts (less than 10%) of sand interspersed, light-gray. Cannonball-Ludlow Formations.
- Wells 60, 61 and 62 0-2 Top soil, silty, clayey, dark-brown to tanish-brown, calcareous.
- 2-25 Silt, very clayey, with some minor amounts (less than 10%) of very fine- to fine-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with abundant small gypsum crystals and thin silt and sand lenses; Cannonball-Ludlow Formations.
- Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 29-36 Silt, as above, clayey, less sand than above interval, dark-brownish-tan, oxidized.
- 36-60 Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin (less than 1 foot) sandy-silt lenses.

 Cannonball-Ludlow Formations.
- Well 70 0-2 Pebble-loam (glacial till), clayey, sandy, yellowish-brown, unconsolidated, damp, calcareous.
- 2-21 Silty, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, moderately indurated, very dry, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals. Cannonball-Ludlow Formations.

21-24	Shale, silty, steel- to dark-gray (color change), indurated, fissile, very dry; with occasional thin silt and sand lenses.
24-31	Silt, clayey, with abundant (more than 30%) sand, steel-gray, moderately indurated.
31-62	Silt, clayey, with some (less than 20%) very fine- to fine- grained sand interspersed, steel-gray, moderately indurated; with some small gypsum crystals and small iron oxide concretions.
62-76	Silt, as above, with some (less than 20%) fine-grained sand interspersed.
76-82	Silt, as above, with abundant (more than 20%) fine- to medium-grained sand.
82-100	Silt, as above, clayey, with some (less than 20%)
	fine-grained sand interspersed, dark-gray. Cannonball-Ludlow Formations.

The lithologic logs for wells 1-4 were described by personal from Water Supply Incorporated (WS), Bismarck, North Dakota. The wells were installed during a previous ground water investigation at Heskett Station.

Well WS 2	
0-1	Top soil, silty, black.
1-4	Pebble-loam (glacial till), silty, clayey, some
	cobbles, yellowish-brown.
4-7	Gravel, sand and rocks.
7-21	Sand, fine- to coarse-grained, some pebbles.
21-39	Clay silty sandy vollowish brown to
39-52	Clay, silty, sandy, yellowish-brown to gray.
52-67	Clay, silty, sandy, gray.
32-07	Sand, fine-grained, bluish, with some clay
67-89	layers.
07-03	Clay, silty, sandy, brown to gray.
Wells WS 1, 1	A and ID
0-1	
1-4	Top soil, silty, black
1,74	Clay, (glacial), silty, with pebbles,
4 21	yellowish-brown.
4-21	Sand, fine- to medium-grained, yellowish-brown;
01 00	with clay and silt lenses.
21-25	Clay, silty, yellowish-brown.
25-30	Sand, fine-grained, yellowish-brown, some
7.	indurated layers.
30-35	Clay, silty, yellowish-brown.
35-45	Sand, fine-grained, yellowish-brown.
45-50	Clay, silty, sandy, gray, about 50 percent shale.
50-56	Sand, fine-grained, with clay layers.
56-73	Clay, silty, sandy, gray.
	3, 5 mm J, 9, 3, au
WE11s WS 4, 4/	Asand 4B
0-13	Pebble-loam (glacial till), silty, sandy, with
	some cobbles, yellowish-brown.
13-23	Sand, fine- to medium-grained, yellowish-brown.
23-25	Slay, silty, sandy, yellowish-brown.
25-27	Sandstone, indurated.
27-30	
30-36	Clay, sandy, silty, gray.
36-52	Sand, fine-grained, gray.
30-32	Clay, silty, sandy, gray; with some sand layers.
Wells WS 3 and	1.21
0-1	
	Top soil, silty, black.
1-12	Pebble-loam, clayey, silty, with some cobbles,
10.16	yellowish-brown.
12-16	Clay, silty, gray; with some shale layers.
16-18	Limestone, indurated.
18-23	Clay, silty, yellowish-brown; with some sand
Salas Salas A	layers.
23-44	Sand, fine- to medium-grained, gray; with some
	clay layers.
44-50	Clay, silty, medium-gray.



			Barr Engi 234 West Bismarck	t Centi	ury Av	npany enue	LOC	G OF	BORING MW-4
	AR	R	Telephon	e: 70°	1-255				SHEET 2 OF
Proje Loca	ect No ation:N dinate	.:343 Manda	Station 01012 an, ND t: 46.866	20° Lo	ong: -	Surface Elevation: Drilling Method:HSA Sampling Method:Split Completion Depth:46.0	Spoon	Jnique	Well No.:MW-44 R
Depth, feet	Sample Type & Recovery	Sample No.	Blows/6in.	2000	Graphic Log	LITHOLOGIC DESCRIPTION			LL OR PIEZOMETER CONSTRUCTION DETAIL
30-	-	11	8-12-14- 18. 8-13-16- 27.	CL		(CL): At 24': Color change to dark brown (3/3 7.5YR). (continued) Wet; 0% gravel, 20% sand, 80% fines. At 30.5': Sand lens. (CL): At 32': Color change to dark gray (4/1 7.5YR).			PRO. CASING Diameter. 4" by 4" Type: Steel Interval: 3' up & 3' down RISER CASING Diameter. 2" Type: Schd 40 PVC Interval: Stick up to screen (23') GROUT Type: Cement. Interval: 0-0.5' BGS
40	X	13	11-19-25- 27.	\ <u>SC</u> /		(SC): At 45.8°. Clayey Sand (SC), fine to medium grained, low to media greenish gray (4/10G Gley 2).	im plasticity, dark		Type: Bentonite Interval: Chips 0.5-21' BGS SANDPACK Type: Granusil Interval: 21-46' BGS SCREEN Diameter: 2" Type: No. 10 Slot Interval: 23-43' BGS
50-									
te Bo gged	By: Contr	Comp	oleted:	10/20 10/20 JEG: Midw	0/14	Remarks: Water encountered a esting (Terracon) Additional data may have been collected in the field Weather:			nile drilling on 10/2014

State of North Dakota

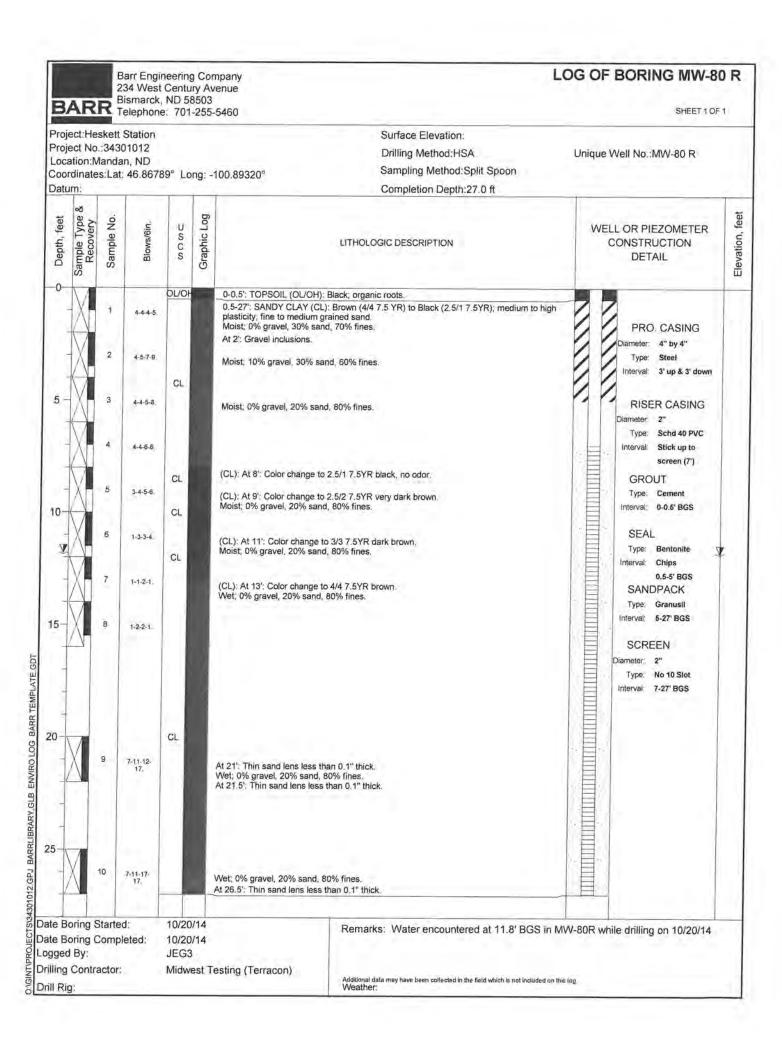
BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

1. WELL OWNER	Well head completion:
	24" above grade Other x
Name MDU-Heskett Station	If other, specify 4" x 4" x 5' steel cover
Address 2025 38 th Street	Was protective casing installed? ■ Yes □ No
Mandan, North Dakota	Was well disinfected upon completion? □ Yes ■ No
2. WELL LOCATION (MW-44R)	
Address (if in city) (see attached drawing)	5. WATER LEVEL
	Static water level 28.5 feet below surface
County	If flowing: closed in pressure psi or ft. above land surface
<u>SE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W.</u> Lat. <u>46.86620 Long.</u> : <u>-100.89313</u>	6. WELL LOG Depth (Ft.)
Altitude:	Formation From To
3. METHOD DRILLED	Topsoil 0 0.5
■ Auger Other	Sandy lean clay 0.5 5
4. WELL CONSTRUCTION	Sandy feeling 5 46
Diameter of Hole 8 inches Depth 46 feet	Sality lat clay 5 40
Riser: PVC Other	
■ Threaded □ Solvent □ Other	
Riser rating SDR Schedule40	
Diameter 2.0 inches	
From +2 ft. to 23 ft.	
Was a well screen installed? ■ Yes □ No	
Material Schedule 40 PVC Diameter 2.0 inches	
Slot Size #10 set from 23 feet to 43 feet	
Sand packed from 21 ft to 46 ft	(Use separate sheet if necessary)
Depth grouted from 1 ft to 21 ft	7. WAS THE HOLE PLUGGED OR ABANDONED?
Grouting Material	□ Yes ■ No
Bentonitex Other	If so, how?
If other explain:	
One foot concrete collar at surface	8. REMARKS 3 steel bumpers installed around well head
	9. DATE COMPLETED 10-21-14
	10. CONTRACTOR CERTIFICATION
	This well was drilled under my jurisdiction and this report is true to the
	best of my knowledge. Midwest Testing Laboratory, Inc. 444
	Monitoring Well Contractor Certificate No.
	P.O. Box 2084, Bismarck, ND 58502-2084
	Address
	MINIT 10-22-14
-	Signature Date



State of North Dakota

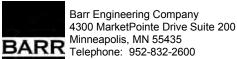
BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT

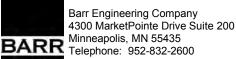
State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

1. WELL OWNER	
I. WELL OWNER	Well head completion:
Name MDU-Heskett Station	24" above grade Other x
Address 2025 38 th Street	If other, specify 4" x 4" x 5' steel cover
Mandan, North Dakota	Was protective casing installed? ■ Yes □ No
2. WELL LOCATION (MW-80R)	Was well disinfected upon completion? ☐ Yes ■ No
Address (if in city) (see attached drawing)	5. WATER LEVEL
	Static water level 12 feet below surface
County Morton	If flowing: closed in pressure psi or ft. above land surface
NE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W.	6. WELL LOG Depth (Ft.)
Lat. 46.86789 Long.: -100.89320	
Altitude:	Formation From To
3. METHOD DRILLED	Topsoil 0 0.5
■ Auger Other	Sandy lean clay 0.5 27
4. WELL CONSTRUCTION	
Diameter of Hole 8 inches Depth 27 feet	
Riser: ■ PVC □ Other	
■ Threaded □ Solvent □ Other	
Riser rating SDR Schedule40	
Diameter 2.0 inches	
From <u>+2.5</u> ft. to 7 ft.	
Was a well screen installed? ■ Yes □ No	
Material Schedule 40 PVC Diameter 2.0 inches	
Slot Size #10 set from 7 feet to 27 feet	
Sand packed from5 ft to27 ft	(Use separate sheet if necessary)
Depth grouted from 1 ft to 5 ft	7. WAS THE HOLE PLUGGED OR ABANDONED?
Grouting Material	□ Yes ■ No
Bentonitex Other	If so, how?
If other explain:	
One foot concrete collar at surface	8. REMARKS
	3 steel bumpers installed around well head
	9. DATE COMPLETED 10-21-14
	10. CONTRACTOR CERTIFICATION
	This well was drilled under my jurisdiction and this report is true to the
	best of my knowledge. Midwest Testing Laboratory, Inc. 444
	Monitoring Well Contractor Certificate No.
	P.O. Box 2084, Bismarck, ND 58502-2084
	Address
	Mil Stat 10-22-14
	Signature Date
	Date



LOG OF BORING MW-101 DRAFT

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No USCS WELL OR PIEZOMETER Blows/6in Elevation, Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 4-4-4-6 SANDY LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); PRO. CASING 1715 moist; thinly laminated; some mottling; low plasticity; [Cannonball Formation]. iameter: 4" At 2': Start to see gravel inclusions. Type: Steel pipe 4-6-6-7 Interval: 3.5' ags - 1.5' bgs At 4': Oxidized staining. RISER CASING 5 7-9-14-16 At 5': Oxidized staining. Type: PVC SCH 80 Interval: 2.98' ags - 34' 1710⁻ bgs 8-9-12-15. At 7': Oxidized staining and white staining. **GROUT** Type: Neat cement Interval: 0 - 29' bgs 5 10-15-21-26. **SEAL** 10 Type: Bentonite chips Interval: 29 - 32' bgs CL 7-18-24-At 11': Oxidized staining. 1705 **SANDPACK** Type: Silica 40-70 8-12-19-23. Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 8-14-18-23. At 15': Gypsum. Type: PVC SCH 80 Interval: 34 - 54' bgs 16-20': No recovery. 1700 20 At 20.5': Gypsum. 7-10-13-15. LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to 1695· high plasticity; [Cannonball Formation]. At 22': Color change to Brown (4/2 7.5YR). 10 7-9-13-15. CL At 24': Interbedded sand, fine grained. Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



Drill Rig:

Rig mounted HSA

LOG OF BORING MW-101

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No WELL OR PIEZOMETER USCS Blows/6in Elevation, Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to high plasticity; [Cannonball Formation]. (continued) At 25' and 25.5': Gypsum. PRO. CASING 1690 At 26.5': Gypsum. 12 8-11-15-19. iameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 13 8-11-13-15. RISER CASING At 29.5': Gypsum. 30 meter: 2" CL Type: PVC SCH 80 14 6-11-14-17. 2.98' ags - 34' Interval: 1685⁻ bgs **GROUT** 15 8-13-17-22. Type: Neat cement At 33': Gypsum. Interval: 0 - 29' bgs 1 At 34.5': Gypsum. **SEAL** 35 8-14-19-21. Type: Bentonite chips At 35.5-36': Color change to Black (2.5/1 7.5YR), turns back to brown. Interval: 29 - 32' bgs FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball 1680· Formation]. **SANDPACK** 17 11-16-20-27 Type: Silica 40-70 Interval: 32 - 56' bgs At 38': Oxidized staining. 18 9-13-20-25. **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 34 - 54' bgs 19 7-14-23-26. At 41': Oxidized staining. 1675 9-16-23-45 1670 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) M:\GINT\PRO. Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

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LOG OF BORING MW-101 DRAFT

BARR Telephone: 952-832-2600 SHEET 3 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. USCS WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** -50 FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball Formation]. (continued) PRO. CASING 1665 Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 55 Diameter: 2" Type: PVC SCH 80 Interval: 2.98' ags - 34' 1660· bgs **GROUT** Type: Neat cement End of boring 58.0 feet Interval: 0 - 29' bgs **SEAL** 60 Type: Bentonite chips Interval: 29 - 32' bgs SANDPACK Type: Silica 40-70 Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot 65 Type: PVC SCH 80 Interval: 34 - 54' bgs 70 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Date Boring Completed: 8/19/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



Drill Rig:

Rig mounted HSA

LOG OF BORING MW-102

BARR MILITINE PROPERTY SERVICE PROPERTY SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1703.8 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum:NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet ž WELL OR PIEZOMETER USCS Blows/6in Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 3-3-3-2 LEAN CLAY (CL): medium grained; Brown (4/3 7.5YR); moist; low to medium plasticity; PRO. CASING with gravel to 4'; [Cannonball Formation]. ameter: 4" Type: Steel pipe 3-2-2-3 Interval: 3.5' ags - 1.5' 1700bgs RISER CASING 3 CL 3-3-4-5 2" Type: PVC SCH 80 2.85' ags - 10' Interval: bgs 3-4-5-7 **GROUT** Type: None Interval: None 1695⁻ 4-8-7-4 SANDY SILT WITH GRAVEL (ML): Strong Brown (5/6 7.5YR); fine to coarse sand, fine to ML medium gravel, unconsolidated; [Cannonball Formation]. **SEAL** 10 LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); some Bentonite chips Type: mottling; medium plasticity; [Cannonball Formation]. Interval: 0 - 8' bgs CI 4-3-5-9 **SANDPACK** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Type: Silica 40-70 Formation] Interval: 8 - 31' bgs 3-5-7-9 1690· **SCREEN** $\sqrt{}$ Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 6-8-12-14 Type: PVC SCH 80 Interval: 20 - 30' bas 6-10-12-16 CL 1685 10 5-9-14-16 20 5-12-15-18. At 21': Color changes to Black (2.5/1). 12 9-15-18-22. 1680-Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51 Logged By: JEG3 Drilling Contractor: Terracon

Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

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Drill Rig:

Rig mounted HSA

LOG OF BORING MW-102

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1703.8 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum:NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. USCS WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 9-14-19 LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Formation]. (continued) PRO. CASING 14 10-17-18-24. Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' 1675 bgs 15 6-15-18-At 29': Gypsum. RISER CASING 30 Diameter: 2" Type: PVC SCH 80 16 7-14-18-22. Interval: 2.85' ags - 10' bgs **GROUT** 17 11-16-20-27. Type: None Interval: None At 33.5' and 34': Gypsum. 1670· CL **SEAL** 35 10-14-15-24 Type: Bentonite chips Interval: 0 - 8' bgs **SANDPACK** 19 13-19-25-35. Type: Silica 40-70 Interval: 8 - 31' bgs 1665⁻ 20 8-17-26-31. **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 20 - 30' bgs 21 10-20-27-38. 22 13-20-27-37. 1660 SILTY SAND (SM): fine to medium grained; Dark Gray (4/1 7.5YR); wet; [Cannonball Formation1. 45 23 SM 15-27-27-32. End of boring 46.0 feet Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company Minneapolis, MN 55435 BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 Project No.:34300014.12 Location: Mandan, ND

JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-103

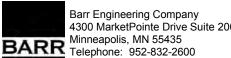
4300 MarketPointe Drive Suite 200 SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Drilling Method: HSA Unique Well No.: Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum:NAD 83 Completion Depth:44.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL (OL/OH): Brown (5/4 7.5YR). DL/OH 3-4-5-5 LEAN CLAY (CL): Very Dark Gray (3/1 7.5YR); moist; stiff; medium to high plasticity; PRO. CASING [Cannonball Formation]. iameter: 4" Type: Steel pipe 5-5-8-8 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 1710 5-8-10-11 Type: PVC SCH 80 2.79' ags - 24' Interval: bgs 6-9-15-15. POORLY GRADED SAND WITH GRAVEL (SP): fine to coarse grained; Brown (5/4 **GROUT** 7.5YR); some oxidized staining, some mottling; [Cannonball Formation]. Type: Neat cement Interval: 0 - 19' bgs 5-6-5-4 SP **SEAL** 1705 10 Type: Bentonite chips Interval: 19 - 22' bgs 4-5-5-7 **SANDPACK** POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; Brown (5/4 Type: Silica 40-70 7.5YR); [Cannonball Formation]. Interval: 22 - 44' bgs 2-2-2-3 SP-**SCREEN** SM 1700 Diameter: 2"; No.6 slot 15 3-3-3-3 Type: PVC SCH 80 Interval: 24 - 44' bas NO RECOVERY (16 - 20'). 1695 20 SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. 3-3-5-5 CL 1690· Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-103

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum:NAD 83 Completion Depth:44.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet Sample No USCS WELL OR PIEZOMETER Blows/6in Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. (continued) 2-2-4-4 PRO. CASING Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 1685 30-Diameter: 2" SILTY SAND WITH GRAVEL (SM): wet; [Cannonball Formation]. SM Type: PVC SCH 80 10-10-7-9. LEAN CLAY (CL): Brown (4/4 7.5YR); moist; oxidized staining; medium to high plasticity; Interval: 2.79' ags - 24' [Cannonball Formation]. bgs **GROUT** At 32.5': Sand lens, color changes to Black (2.5/1 7.5YR). 12 8-15-17-22. Type: Neat cement Interval: 0 - 19' bgs At 33.5': Sand lens. At 34': Interbedded sand with oxidized staining. **SEAL** 1680-35 13 7-19-15-Type: Bentonite chips Interval: 19 - 22' bgs At 36.5': Sand lens. **SANDPACK** 11-16-21-50 for 5". At 37': Sand lens. CI Type: Silica 40-70 At 37.5': Color change to Gray (5/1 7.5YR). Interval: 22 - 44' bgs At 38-38.5': 6" thick layer of hard material. 15 50 for 2"`-. **SCREEN** 1675 Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 24 - 44' bas 16 12-17-22-30. At 42-42.5': Silt layer. 9-18-24-50. At 43.5-44': Silt layer. End of boring 44.0 feet 45 Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



LOG OF BORING MW-104

1660·

4300 MarketPointe Drive Suite 200 DRAFT BARR MILITINE PROPERTY SERVICE PROPERTY SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum:NAD 83 Completion Depth:32.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). LEAN CLAY WITH SAND (CL): fine to medium grained; Brown (5/4 7.5YR); moist; gravel; 4-5-5-5 medium plasticity; [Cannonball Formation]. 1680· PRO. CASING ameter 4" CL Type: Steel pipe 3-5-6-8 Interval: 3.5' ags - 1.5' bgs LEAN CLAY (CL): Brown (4/4 7.5YR); oxidized staining and mottling; medium to high plasticity; with gypsum throughout; [Cannonball Formation]. RISER CASING 5 3 3-7-9-10 Type: PVC SCH 80 3.06' ags - 9' Interval: 1675 bgs 5-7-9-10. **GROUT** Type: None Interval: None 5 5-9-9-10. **SEAL** 10₹ Type: Bentonite chips Interval: 0 - 7' bgs 5-7-9-10. CL 1670⁻ **SANDPACK** At 12': Heavily oxidized. Type: Silica 40-70 5-8-8-12. Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 8 5-9-11-15. At 15': Start seeing black staining. Type: PVC SCH 80 Interval: 9 - 29' bas 1665 6-9-11-13. At 17': Heavily oxidized. SILTY SAND (SM): Strong Brown (5/6 7.5YR); wet; [Cannonball Formation]. 10 4-7-16-19 At 19.5': Color change to Brown (5/4 7.5YR). 20

Date Boring Started:

Drilling Contractor:

Drill Rig:

12

Date Boring Completed: 8/20/15 Logged By:

Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26)

JEG3 Terracon Rig mounted HSA

8/20/15

SM

CH

At 21': Oxidized layer.

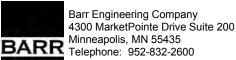
layers below 27'; [Cannonball Formation].

5-16-22-26

7-11-14-

Additional data may have been collected in the field which is not included on this log. Weather:

FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand



Drill Rig:

Rig mounted HSA

LOG OF BORING MW-104

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum:NAD 83 Completion Depth:32.0 ft Elevation, feet Sample Type & Recovery Graphic Log Sample No. Depth, feet USCS WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 6-12-16 17. FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand layers below 27'; [Cannonball Formation]. (continued) 1655· PRO. CASING 14 8-12-16-21. Diameter: 4" CH Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 15 8-12-16-20. RISER CASING 30 Diameter: 2" Driller notes: sluff. Type: PVC SCH 80 16 Interval: 3.06' ags - 9' 1650bgs End of boring 32.0 feet **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 9 - 29' bgs 45 _50____ Date Boring Started: 8/20/15 Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26) Date Boring Completed: 8/20/15 Logged By: JEG3 **Drilling Contractor:** Terracon

Additional data may have been collected in the field which is not included on this log. Weather:



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-105

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum:NAD 83 Completion Depth:30.0 ft feet Sample Type & Recovery Graphic Log feet Š USCS WELL OR PIEZOMETER Blows/6in Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 1685⁻ 6-7-6-5 SANDY LEAN CLAY (CL): fine to medium grained; Brown (4/2 7.5YR); moist; gravel; PRO. CASING medium plasticity; [Cannonball Formation]. ameter: 4" Type: Steel pipe 5-5-5-6 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 5 3 3-2-4-5 neter: 2" Type: PVC SCH 80 1680-3.16' ags - 10' Interval: bgs 4 2-2-2-3 **GROUT** Type: None LEAN CLAY (CL): Brown (4/2 7.5YR); soft; high plasticity; wet at 16'; [Cannonball Formation]. Interval: None 2-1-2-2. 10<u>⊣</u> **SEAL** Type: Bentonite chips At 10.5': Color change to Reddish-Yellow (6/6 7.5YR). Interval: 0 - 7' bgs 1675 2-1-2-1 **SANDPACK** Type: Silica 40-70 Interval: 7 - 30' bgs 2-1-1-3 **SCREEN** At 14.5-15.5': Gravel inclusions. Diameter: 2"; No.6 slot 15 CL 4-3-5-5 Type: PVC SCH 80 At 15.5': Color change to Brown (4/3 7.5YR). Interval: 10 - 30' bas 1670-7-9-11-13. At 18': Color change to Brown (5/3 7.5YR). 10 7-9-11-13 20 1665 11 7-9-13-15. POORLY GRADED SAND WITH SILT (SP-SM): medium to coarse grained; Brown (5/4 7.5YR); [Cannonball Formation]. 12 19-26-28-30. SP-SM Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 Telephone: 952-832-2600

M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

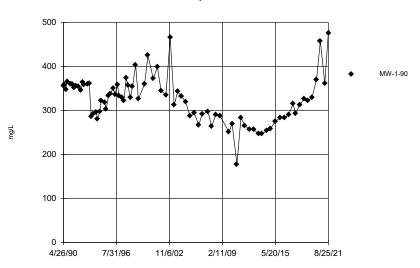
LOG OF BORING MW-105 DRAFT

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum:NAD 83 Completion Depth:30.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. USCS WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** FAT CLAY (CL): Dark Brown (3/4 7.5YR); high plasticity; sand lens at 26.5'; [Cannonball 1660· At 26': Color change to Gray (5/1 7.5YR). PRO. CASING 14 10-15-18-30. Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 11-16-22-32. RISER CASING 30 Diameter: 2" End of boring 30.0 feet Type: PVC SCH 80 Interval: 3.16' ags - 10' bgs **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 30' bgs **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 10 - 30' bgs 45 _50____ Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

Appendix F

MW1-90 Time Series Plots

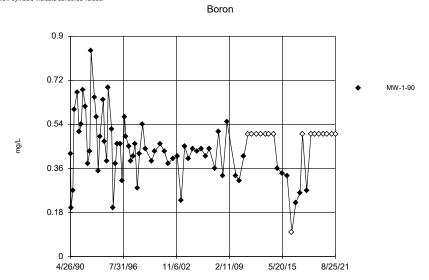
Alkalinity, bicarbonate



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

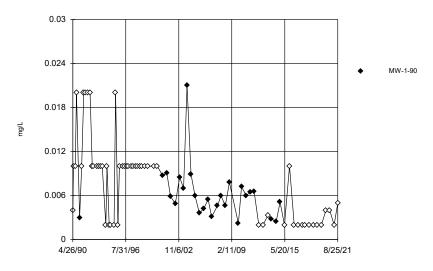
${\it Sanitas}^{\rm tw}\,v.9.6.32\,{\it For the statistical analyses of ground water by Barr Engineering Company only.\,UG\,Hollow symbols indicate censored values.}$



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

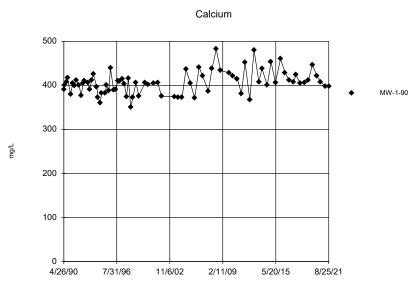
Arsenic



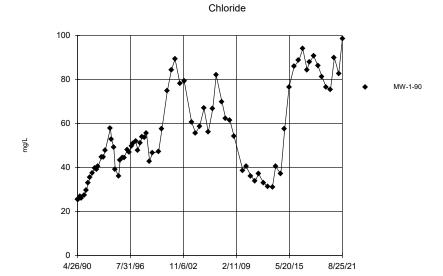
Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



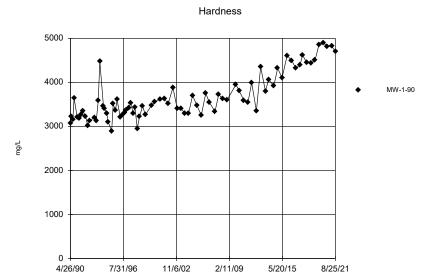
Time Series Analysis Run 3/8/2022 9:43 AM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

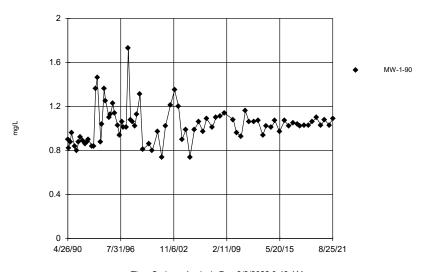




Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

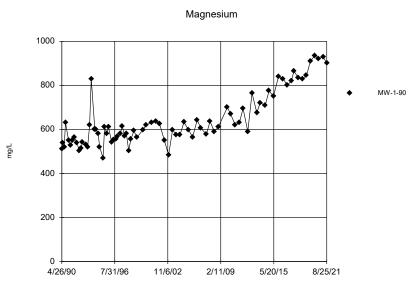




Time Series Analysis Run 3/8/2022 9:43 AM

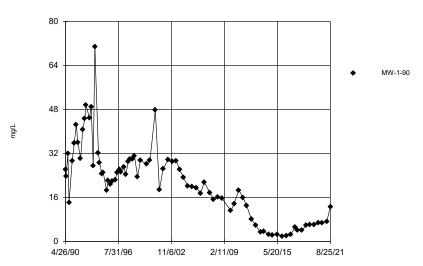
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 3/8/2022 9:43 AM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190





Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

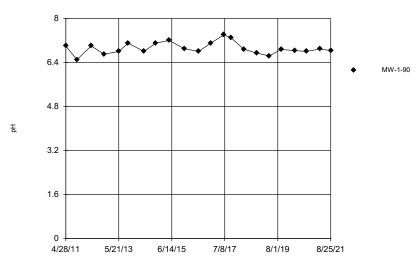
Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

Potassium 30 24 18 12 6 0 4/26/90 7/31/96 11/6/02 2/11/09 5/20/15 8/25/21

Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

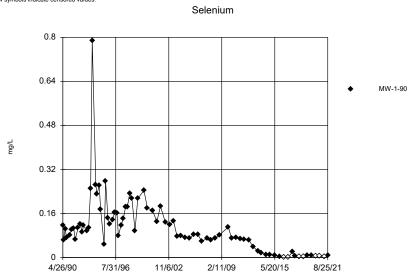




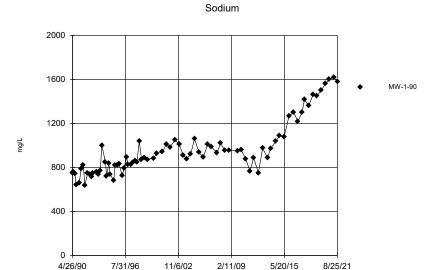
Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG Hollow symbols indicate censored values.



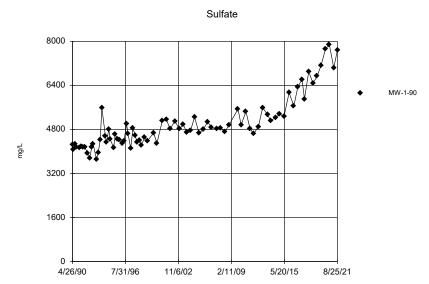
Time Series Analysis Run 3/8/2022 9:43 AM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

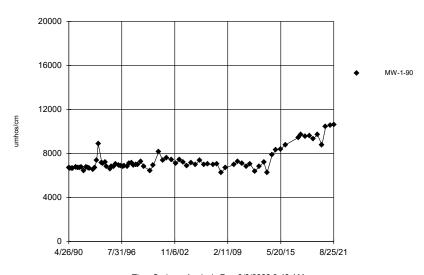
Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

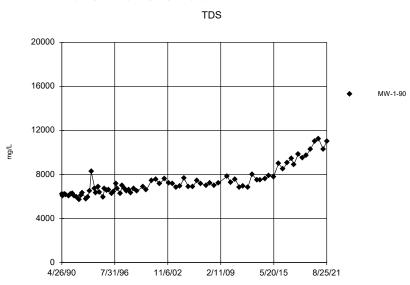
Specific conductance



Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

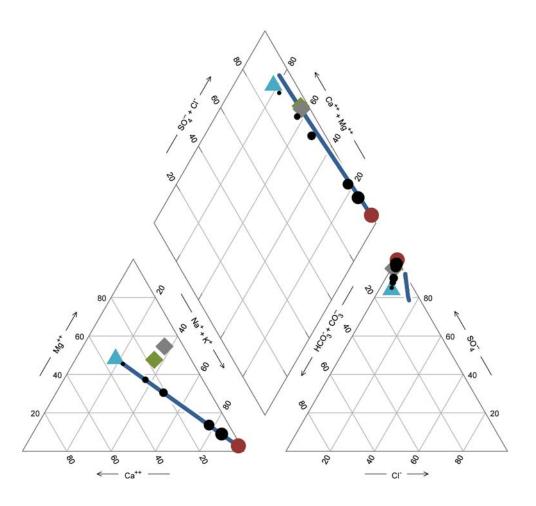


Time Series Analysis Run 3/8/2022 9:43 AM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Appendix G

Geochemist's Workbench Results

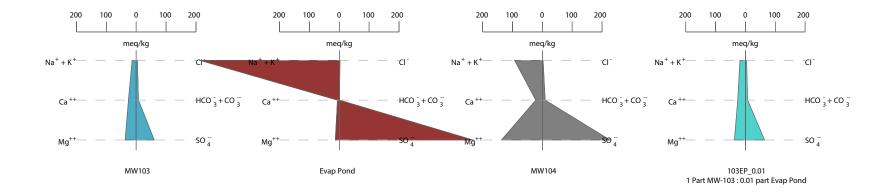


% meq/kg



- Evaporation Pond
- 1 part MW-103 : 1 part Evap Pond
- 1 part MW-103 : 0.50 part Evap Pond
- 1 part MW-103: 0.10 part Evap Pond
- 1 part MW-103 : 0.05 part Evap Pond
- 1 part MW-103: 0.01 part Evap Pond
- **♦**MW1-90
- **►**MW104

Figure G.1
Piper Plot for Mixing
Evaporation Pond into MW-103
R.M. Heskett Station
Alternative Source Demonstration
August 2021 Event
Montana Dakota Utilities
Mandan, North Dakota



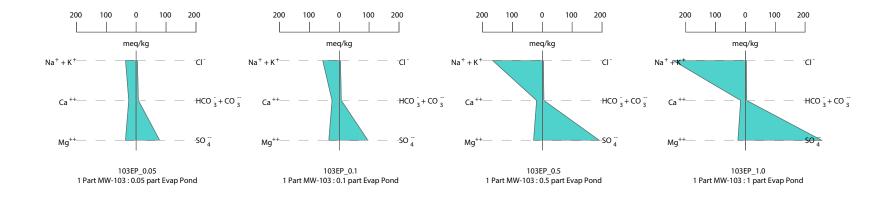


Figure G.2
Stiff Plot for Mixing
Evaporation Pond into MW-103
R.M. Heskett Station
Alternative Source Demonstration
August 2021 Event
Montana Dakota Utilities
Mandan, North Dakota

Table G.1
Geochemist's Workbench Mixing Model Results

Descr	ription	Upgradient	Evap Pond		Mixing Evap Pond into MW 103					Downgradient	
Samı	ole ID	MW-103	Evap Pond	1:0.01	1:0.01 1:0.05 1:0.1 1:0.5 1:1				MW1 90	MW 104	
HCO3	mg/l	457	20	453	436	417	311	239	259	591	
Ca++	mg/l	530	125	526	511	493	395	328	453	448	
CI	mg/l	142	79.8	141	139	136	121	111	57.4	87.6	
F	mg/l	0.15	0.1	0.15	0.15	0.15	0.13	0.13	1.07	0.55	
Mg++	mg/l	458	165	455	444	431	360	312	775	1,700	
рН	SU	6.5	10.7	6.5	6.5	6.5	6.6	6.9	7.1	6.8	
K+	mg/l	18.8	734	25.9	52.9	83.9	257	377	25.2	37	
Na+	mg/l	311	10,600	413	801	1,250	3,740	5,460	1,090	2,160	
SO4	mg/l	2,930	22,100	3,120	3,840	4,670	9,320	12,500	5,350	11,100	
TDS	mg/kg	4,860	34,000	5,150	6,270	7,540	14,700	19,500	7,910	17,700	



Alternative Source Demonstration: May 2022 Event

R.M. Heskett Station

Prepared for Montana-Dakota Utilities Co.

December 2022

Alternative Source Demonstration May 2022 Event

December 2022

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Certifications

I hereby certify that I, or my agent, have examined this written demonstration and attest that this Coal Combustion Residuals Facility Alternative Source Demonstration (ASD) is accurate and has been prepared in accordance with good engineering practice, including consideration of applicable industry standards and the requirements of 40 CFR §257.94. I further certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the state of North Dakota.

Revision	Date	Summary of Revisions
0	December 21, 2022	May 2022 Event Alternative Source Demonstration

Thomas J. Radue

1 Introduction

Montana-Dakota Utilities Co. (MDU) owns and operated R.M. Heskett Station (Site), a coal-fired generating station and a gas-fired turbine located in Mandan, Morton County, North Dakota (Figure 1). Coal unit operations at the Site ended in March 2022, and the generating station is now undergoing demolition. One CCR (coal combustion residual) unit, as defined by 40 CFR 257.53, is located on the property. The CCR unit contains coal combustion by-products, asbestos wastes generated from construction activity associated with MDU-owned facilities, and ash derived from burning tire-derived fuel (TDF) at the facility.

The CCR Rule (US EPA, 2015) §257.94(e)(2) allows for an alternative source demonstration (ASD) in the event of an identified statistically significant increase (SSI) in a water quality parameter in a downgradient monitoring well over background levels:

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

The purpose of this work is to evaluate the data collected as part of the May 2022 monitoring event, along with historical data, to demonstrate if the SSIs are the results of a "source other than the CCR unit" or due to natural variation in groundwater quality or an error in sampling, analysis, or statistical evaluation.

2 May 2022 SSIs

Sampling for the first detection monitoring event in 2022 was conducted May 2-3, 2022. Five potential SSIs over background were identified and verified as SSIs by resampling: calcium at MW2-90 and MW3-90, chloride at MW-80R, and fluoride and total dissolved solids (TDS) at MW1-90 (see time series plots in Appendix A and prediction limit plots in Appendix B).

Evaluations were undertaken to review potential alternative sources for the SSIs. These evaluations included comparing leaching tests of on-site CCR materials, leachate collected in the Evaporation Pond (non-CCR unit), regional (background) groundwater quality data, groundwater quality data from additional site wells, and groundwater quality data collected at the Site prior to construction of the CCR unit.

Several characteristics of the CCR unit, Site geology, groundwater monitoring well locations, and historic groundwater quality data prompted consideration of potential alternative sources for the SSIs, including elevated water quality parameters in pre-landfill and upgradient groundwater monitoring data, site-specific geologic conditions, and/or leakage from the Evaporation Pond (non-CCR unit).

A successful demonstration of alternative source(s) for the SSIs are discussed in Section 3.

2.1 May 2022 Sampling Event

Concentrations for potential SSIs observed in May 2022 are presented in Table 1 and are consistent with those observed during the prior seven detection monitoring events.

Table 1 Detection Monitoring Results for Potential SSI Well-Parameter Pairs

		PL			Dete	ction Mo	nitoring l	Results (r	ng/L)		
Well	Parameter	(mg/L)	April 2018	Oct. 2018	April 2019	Sept. 2019	April 2020	Sept. 2020	March 2021	Aug. 2021	May 2022
MW2-90	Calcium	442	462	452	450	494	477	510	500	505	451
MW3-90	Calcium	442	445	dry	442	464	386	486	505	dry	506
MW-80R	Chloride	95.9	157	165	146	146	143	147	134	155	162
MW1-90	Fluoride	1.04	1.03	1.03	1.06	1.1	1.03	1.08	1.03	1.09	1.12
MW1-90	TDS	11,100	9,810	9,490	9,740	10,300	11,000	11,200	12,200	11,000	11,600

Bolded values indicate concentrations exceed the associated interwell prediction limits (PL). Dry: sample was not collected due to insufficient volume of water in well.

Trend analysis results indicate:

- Calcium at MW2-90, though above the prediction limit, does not have a statistically significant trend
- Calcium at MW3-90, though above the prediction limit, has a statistically significant decreasing trend

- Chloride at MW-80R, though above the prediction limit, has a statistically significant decreasing trend
- Fluoride at MW1-90 has a statistically significant increasing trend
- TDS at MW1-90 has a statistically significant increasing trend

Methods used to evaluate potential alternative sources as the basis for water quality parameter concentrations over background from the May 2022 detection monitoring event are discussed in Section 3.

2.2 Verification Sampling

Verification resampling was conducted in August 2022 for the well-parameter pairs with potential SSIs. The five potential SSIs were verified.

Table 2 Verification Resampling Results for Potential SSI Well-Parameter Pairs

Well	Parameter	Interwell Prediction Limit (mg/L)	May 2022 (mg/L)	August 2022 (mg/L)
MW2-90	Calcium	442	451	508
MW3-90	Calcium	442	506	501
MW-80R	Chloride	95.9	162	154
MW1-90	Fluoride	1.04	1.12	1.14
MW1-90	TDS	11,100	11,600	12,700

Bolded values indicate concentrations exceed the associated interwell prediction limits (PL).

3 Alternative Source Demonstration

The purpose of this ASD Report is to evaluate whether the May 2022 SSIs were due to a CCR unit release or due to another source or to error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. For each SSI, three hypotheses regarding the potential source of the SSI are assessed: (1) a release of leachate from the CCR unit is the source of one or more of the SSIs, (2) natural variations of non-landfill or regional groundwater quality are the source of one or more of the SSIs, or (3) a release of leachate from the Evaporation Pond (non-CCR unit) is the source of one or more of the SSIs.

Successful demonstrations of alternative sources have previously been documented for three of the four parameters with SSIs at locations within the previous monitoring network. The associated ASD Reports (included as appendices to Barr, 2019; Barr, 2020; Barr, 2021; and Barr, 2022) documented that each of the SSIs could be explained by natural groundwater quality variability based on concentrations that were either present at the Site before the landfill was constructed, consistent with regional groundwater quality data, and/or associated with a release from the Evaporation Pond (non-CCR unit).

3.1 Source Hypothesis #1: CCR Unit Release

To accept the hypothesis that a release of leachate from the CCR unit is the source of one or more of the SSIs, it would be assumed that groundwater chemistry at one or more potentially impacted wells (MW2-90, MW3-90, MW-80R, and/or MW1-90) would be geochemically similar to impacted water from the CCR unit represented by leach testing results. However, if they are geochemically dissimilar, this indicates that a source "other than the CCR unit" may be responsible for the SSI. Therefore, major ion chemistry from the CCR groundwater monitoring locations (upgradient and downgradient) was compared to CCR Synthetic Precipitation Leaching Procedure (SPLP; EPA Method 1312) data collected July 2011 (Appendix C).

To test this hypothesis, a Piper diagram (Figure 2) was used to visually compare the CCR SPLP results (Appendix C) and the measured groundwater quality at the Site. Piper diagrams are plots of major ion chemistry of water samples (calcium, magnesium, potassium, sodium, chloride, sulfate, and [bi]carbonate) that are used to differentiate between water types and to identify potential mixing of water types. This method is a means to identify or "fingerprint" water samples by their common characteristics (major ions) to assess which types of water are similar or dissimilar to potential source water types (Helsel et al., 2020). On the Piper diagram depicted in Figure 2, downgradient well compositions are shown as circular points, CCR SPLP compositions as orange triangles, and the range of upgradient compositions as a yellow polygon.

Downgradient water quality (including the SSI parameter-well pairs) is characterized as an intermediate-SO₄ type water, whereas the ash SPLP results are Na-SO₄ type water. The major difference observed between the downgradient water quality and the SPLP results is the dominant cation composition (no cation strongly dominant vs. heavily dominant sodium). Because water quality data from SSI well-parameter pairs are clustered with data from that of the upgradient wells, which are intermediate-SO₄,

rather than near the ash SPLP results, the results indicate that the water chemistry at those locations is more like upgradient groundwater than a potential release from the CCR unit. **Therefore, we reject the hypothesis that the CCR unit is the source of the calcium observed at MW2-90 and MW3-90 and the chloride at MW-80R.**

3.2 Source Hypothesis #2: Natural Variations of Pre-Landfill, Upgradient, or Regional Groundwater Quality

As Source Hypothesis #1 (CCR Unit Release) was rejected as a potential source of the SSIs, the second hypothesis evaluated is that concentrations of SSI parameters are consistent with historical (pre-landfill), upgradient, or regional (background) groundwater data. To test this hypothesis, results of the May 2022 detection monitoring event were compared to groundwater data collected at the Site before the landfill was constructed (pre-landfill data), additional upgradient well data, and/or regional groundwater quality data from the Cannonball Formation and associated units to determine if natural variation is a potential alternative source for the SSIs.

3.2.1 Calcium at MW2-90 and MW3-90

Results from groundwater samples collected in 1986 were included in the 1989 Special Use Disposal Site Permit Application (Permit Application; MDU, 1989). The 1986 samples were collected prior to construction of the CCR unit; an aerial photograph from March 30, 1988, shows the area of the CCR unit, which appears undisturbed (Appendix D).

Discussion of pre-landfill groundwater samples in the Permit Application notes that high calcium, chloride, fluoride, TDS, and other parameters were observed at the Site. Pre-landfill calcium concentrations collected from groundwater at the Site were measured as high as 648 mg/L (Well 44, 1986), indicating that high calcium concentrations pre-date construction of the CCR unit.

The mineralogy of the underlying Fort Union Group may yield an explanation for the elevated calcium concentrations. The dominant lithology observed at the Site is unconsolidated silt in a clay matrix with interspersed fine- to medium-grained sand (10% to 30%). Calcareous (calcium-carbonate-bearing) materials and small gypsum (hydrated calcium sulfate) crystals are documented discontinuously throughout the upper 30 feet of the surface materials, which have been presumed to be the result of diagenetic processes which occur above the water table during alternating wetting and drying cycles (Groenewold et al., 1983). The presence of these minerals can be a source of high calcium concentrations in groundwater.

The boring logs for CCR wells and pre-landfill wells note calcareous material and gypsum occurrences across the Site (Appendix E). As groundwater fluctuates and surface water infiltration occurs, periodic dissolution of these calcium-bearing minerals into the water column may occur, resulting in elevated calcium concentrations.

In 2022, the Site received a new permit from the North Dakota Department of Environmental Quality (NDDEQ). Under the previous permit, the monitoring network included seven upgradient wells to define

background rather than the one upgradient well (MW-13) included in the current network. The high degree of heterogeneity in historical background concentrations, including for calcium, means that the long-term monitoring record includes background data that may exceed statistically determined thresholds. The maximum and median concentrations measured in the seven background wells while the previous groundwater monitoring system was operating are shown below in Table 3.

Table 3 Previously Measured Upgradient Concentration Results for SSI Parameters

Parameter	Interwell Prediction Limit (mg/L)	May 2022 SSI (mg/L)	Maximum upgradient concentration, 2016-2021 (mg/L)	Median upgradient concentration, 2016-2021 (mg/L)
Calcium	442	451 (MW2-90) 506 (MW3-90)	600 (MW-103)	438
Chloride	95.9	162	271 (MW-44R)	35.8
Fluoride	1.04	1.12	1.01 (MW-13)	0.25
TDS	11,100	11,600	10,800 (MW-44R)	5,070

Based on 123 samples collected from seven upgradient/background wells (Barr, 2017) between 2016 and 2021 (Barr, 2018-2022).

The data in Table 3 indicate that higher calcium concentrations than those leading to the May 2022 SSIs have been measured in upgradient/background wells at the Site. Therefore, the degree of natural variability in groundwater calcium concentrations at the Site encompasses the SSIs at MW2-90 and MW3-90.

The presence of soluble calcium-bearing minerals in native subsurface deposits and documentation of elevated calcium in pre-landfill and upgradient groundwater provide multiple lines of evidence substantiating the hypothesis that the SSIs for calcium at MW2-90 and MW3-90 are due to natural variation in groundwater quality. Therefore, we accept the hypothesis that calcium concentrations at MW2-90 and MW3-90 are due to variability in natural conditions and are consistent with regional and Site background groundwater data.

3.2.2 Chloride at MW-80R

As with calcium, heterogeneity in chloride concentrations have been observed at the Site prior to landfill construction and within additional upgradient measurements. Pre-landfill chloride concentrations collected from groundwater at the Site and reported in the 1989 Permit Application were measured as high as 558 mg/L (Well 44, 1986), indicating that high chloride concentrations pre-date construction of the CCR unit. This conclusion is substantiated by concentrations measured in samples from the additional upgradient/background wells at the Site, which have been as high as 271 mg/L (MW-44R, Table 3), exceeding the 162 mg/L measured at MW-80R in May 2022. These results support the hypothesis that the SSI for chloride at MW-80R is due to natural variation in groundwater quality. **Therefore, we accept the hypothesis that chloride concentrations observed at MW-80R are due to variability in natural conditions and are consistent with regional and Site background groundwater data.**

3.2.3 Fluoride at MW1-90

Source Hypothesis #2 was tested by comparing fluoride concentrations collected as part of several regional groundwater quality studies on the Cannonball Formation and associated units. A summary of the range of fluoride concentrations in the Cannonball Formation and associated units is included in Table 4 below.

Table 4 Fluoride Concentrations in Morton County, North Dakota

Reference	Fluoride Conc. Range	Formation/Units	Data Source Location
Ackerman, D.J., 1980. Ground-Water Resources of Morton County, North Dakota. North Dakota Geological Survey Bulletin 72, Part III. 51 p.	0.0 to 4.0 mg/L	Cannonball and Ludlow formations, undifferentiated	Morton County
Crosby, O.A. and Klausing, R.L., 1984. Hydrology of Area 47, Northern Great Plains and Rocky Mountain Coal Provinces, North Dakota, South Dakota, and Montana. USGS Water-Resources Investigations Open- File Report 83-221, 93 p.	0.1 to 6.3 mg/L	Entire Fort Union Formation (includes Cannonball Formation)	Morton County

The Ackerman study provides summary statistics for the fluoride concentrations observed in Morton County. Forty-six samples were analyzed for fluoride; of those, 20 (or 43%) had concentrations greater than 1.3 mg/L (Ackerman, 1980). The fluoride concentration observed at MW1-90 in May 2022 (1.12 mg/L) is within the range of values consistent with naturally occurring concentrations of fluoride associated with the Cannonball Formation in Morton County. However, a statistically significant increasing trend for fluoride at MW1-90 was observed. Therefore, we accept the hypothesis that fluoride concentrations observed at MW1-90 are consistent with regional (background) groundwater data; however, additional source considerations were evaluated, as described in Section 3.3.

3.2.4 TDS at MW1-90

As noted in previous sections, high variability and concentrations of various parameters have been noted in groundwater at the Site and in the region. This observation extends to TDS. The maximum TDS concentration reported in the 1989 Permit Application from 1986 (pre-landfill) was 14,917 mg/L (Well 60), with similar concentrations observed two years later, indicating that high TDS pre-dates landfill construction.

In groundwater at the Site, sulfate accounts for approximately 50-70% of TDS. Therefore, sulfate and TDS concentrations are strongly related. The well-documented presence of gypsum, a source of groundwater sulfate, is discussed in Section 3.2.1. As noted, the boring logs for CCR wells and pre-landfill wells note gypsum occurrences across the Site (Appendix E). As groundwater fluctuates and surface water infiltration occurs, periodic dissolution of gypsum into the water column may occur, resulting in elevated sulfate, and therefore sulfate-dominated TDS, concentrations.

Based on presence of gypsum in native subsurface deposits and documentation of elevated TDS in prelandfill groundwater, the hypothesis that the SSI for TDS at MW1-90 may be due to natural conditions is possible. However, a statistically significant increasing trend for TDS at MW1-90 was observed. Natural/ background groundwater can be affected by site-wide aquifer changes, resulting in trending data, and significantly increasing TDS concentrations were observed in other monitoring system wells, including upgradient well MW-13. **TDS concentrations at MW1-90 may be due to natural conditions; however, additional source considerations were evaluated, as described in Section 3.3.**

3.3 Source Hypothesis #3: Evaporation Pond Release

Two conditions are necessary to accept the hypothesis that a release of Evaporation Pond water is the source of one or more of the SSIs: (1) mechanism of release (such as an issue with the Evaporation Pond liner integrity) and (2) geochemically similar groundwater chemistry at one or more of the potentially impacted wells with water from the Evaporation Pond. Based on proximity, only the SSIs observed at MW1-90 (TDS and fluoride) are being evaluated for this potential source.

3.3.1 TDS and Fluoride at MW1-90

A statistically significant increasing trend in TDS was observed at MW1-90 following the May 2022 detection monitoring event. The only statistically significant trend observed for other Appendix III parameters at this location was for fluoride. Past ASD Reports (Barr, 2020; Barr, 2021; Barr, 2022) attributed elevated TDS concentrations at MW-104 to either natural conditions or a release from the Evaporation Pond. MW-104 is located between the CCR unit and the Evaporation Pond (a non-CCR unit), approximately 225 feet southwest of MW1-90, which is located north of the Evaporation Pond. The Evaporation Pond was designed and constructed to collect surface water run-off from the Site as well as leachate from the CCR Unit. It is not a CCR unit as defined in §257.53. Due to the relative proximity of MW1-90 to the Evaporation Pond and MW-104, an evaluation was conducted to assess the Evaporation Pond liner integrity and potential impacts to downgradient wells and determine the geochemical feasibility of Evaporation Pond water contributing to the conditions observed at MW1-90.

Liner Integrity Evaluation

In the 2010 Annual Report for the Special Waste Disposal Permit (SP-087), it was noted that erosion was encountered at the Evaporation Pond. More specifically, "cuts in the banks of the pond ranged from 8 to 24-inches. Erosion was caused from storm water running into the evaporation pond from closed Slots and the haul road" (MDU, 2011). No repairs were made at that time due to standing water in the pond. Similar erosional features were noted in the 2011 and 2012 Annual Reports, citing erosion cuts of 8 to 48 inches (MDU, 2012; MDU, 2013). These erosion cuts were repaired in 2013 during the construction of Slot 10. Additionally, the 2013 Annual Report stated that "the west wall of the evaporation pond was raised and graded to reroute storm water that accumulates outside of the ash disposal area from the cover of Phase I ash disposal site away from the pond during rain events" (MDU, 2014).

These reports did not specify if the erosional cuts were 8 to 48 inches wide or 8 to 48 inches deep. Based on the Phase I Development "as-constructed" Plan Sheets (January and November 1990), the Evaporation Pond was built with a 3-foot-thick compacted clay liner (MDU, 1989, Exhibit 6-B). If the erosional cuts

were up to 48 inches deep, then the cuts would extend through the entirety of the liner thickness, creating a conduit for Evaporation Pond water to enter the groundwater. Additionally, no details were provided on the materials used for repairing the Evaporation Pond (i.e., if the liner was impacted, whether the erosion cuts were filled in with a comparable clay liner material).

Additionally, the integrity of the Evaporation Pond liner may have been compromised due to cation exchange. Time series plots of groundwater quality at well MW1-90 (Appendix F) show an increase in sodium; this increase is most apparent at MW1-90 between 2012 and 2021. The Evaporation Pond liner may be composed of a clay with sodium as its main interlayer cation (e.g., sodium-montmorillonite and/or sodium-bentonite, which are common in the area (Groenewold et al., 1983)), and cation exchange processes can occur between the sodium in the clay and positively charged cations concentrated in the Evaporation Pond water (calcium, magnesium, potassium, and aluminum), increasing the concentration of dissolved sodium as it is released from the clay structure. Over time this exchange may decrease swelling potential and increase hydraulic conductivity of the clay constituting the pond liner, resulting in increased leakage of Evaporation Pond water.

Potential Downgradient Effects

The base of the Evaporation Pond sits at approximately 1675 feet above MSL, whereas historical groundwater elevations in MW-104 and MW1-90 remain below 1675 feet MSL. Therefore, any water leaking from the Evaporation Pond would move radially outward from the pond through the unsaturated zone downward into the groundwater, toward both MW-104 and MW1-90, reaching both wells downgradient of the Pond.

Groundwater monitoring data have consistently been collected from MW1-90 since 1990. As seen in the time series plots (Appendix F; 1990-2022), in approximately 2010 the concentrations of chloride, sulfate, TDS, magnesium, sodium, and specific conductance at MW1-90 began increasing more rapidly. To a lesser extent, changes in concentrations were observed around this same time for potassium, nitrogen, and total alkalinity. This timing corresponds to when the erosional cuts at the Evaporation Pond were first observed in the Annual Monitoring Reports. The increasing trends have continued, despite reports of the erosional cuts being repaired in 2013, except for chloride, which has since leveled off.

Geochemical Feasibility

A simple mixing model was developed in April 2019 (Barr, 2020) to determine the potential of producing a similar water quality to that observed at MW-104 and MW1-90 when mixing Evaporation Pond water with unimpacted upgradient water. This mixing model was conducted in Geochemist's Workbench® v.12.0, using data from water samples collected from the Evaporation Pond and upgradient monitoring well MW-103. The mixing model assumes a starting concentration equal to the upgradient groundwater concentrations and then iteratively mixes it with incremental amounts of Evaporation Pond water. The upgradient groundwater concentrations used in the model were from a sample from upgradient monitoring well MW-103 collected in April 2019, which is assumed to represent the long-term composition of groundwater in that vicinity due to the fairly stable concentrations of major ions exhibited in samples from MW-103 (Barr, 2020). The Evaporation Pond concentrations used in the model were from

a sample collected from the pond in September 2014, which is assumed for the purposes of the model to represent a typical Evaporation Pond water composition during the period when the pond liner was compromised.

The results of the model are provided in Appendix G. Figure G.1 shows the results of the mixing model on a Piper diagram. Downgradient wells MW-104 and MW1-90 are shown as gray and green diamonds, respectively. The blue line represents the various possible outcomes when mixing the upgradient water (represented by a blue triangle) with the Evaporation Pond (represented by a red circle). The black circles represent specific proportions (1-part upgradient water to 0.01-, 0.05-, 0.1-, 0.5-, and 1-part Evaporation Pond water). Figure G.2 shows the results as Stiff plots. Table G.1 provides the numerical inputs and results of the various mixing proportions.

As shown on Figure G.1, the downgradient well compositions are similar to the chemistry anticipated if the Evaporation Pond is mixing with upgradient groundwater emanating from the proximity of monitoring well MW-103. The path of the mixing reaction from MW-103 to the Evaporation Pond transects MW1-90 when 1-part upgradient (MW-103) water is mixed with as little as 0.05-part Evaporation Pond water. Therefore, it appears plausible that a relatively small portion of Evaporation Pond water would be needed to "impact" groundwater from upgradient to get a similar chemistry as observed downgradient in MW1-90. The geometry of the Stiff plots in Figure G.2 shows the similarity in ionic composition in the mixing models.

Recorded measurements of fluoride concentrations in the Evaporation Pond have generally been low (<0.3 mg/L), and therefore a release from the Evaporation Pond is unlikely to be a direct source of fluoride to groundwater. However, the Evaporation Pond water has several characteristics that can lead to the release of fluoride from clays and other minerals in aquifer sediments. The pH of the Evaporation Pond is high (≥10), meaning that the water has a high concentration of hydroxide ions. Hydroxide and fluoride have similar ionic radii and charge. Mineralogically, this means that fluoride can easily substitute for hydroxide within mineral structures. In addition, fluoride can sorb to clay, particularly in slightly acidic conditions. A release of high-pH water provides ample hydroxide that can replace fluoride in mineral structures and cause the desorption of fluoride from clay minerals, leading to an increase in fluoride concentrations in groundwater (Edmunds and Smedley, 2013; McMahon et al., 2020).

Based on the description of erosional features extending upwards of 48 inches into the liner of the Evaporation Pond in 2010-2013, corresponding with the increased concentrations of several parameters observed in downgradient monitoring well MW1-90, it is possible that a release from the Evaporation Pond occurred starting in approximately 2011. Furthermore, the results of the geochemical model along with the general proximity and hydraulic position of MW1-90 relative to the Evaporation Pond support the hypothesis that the SSIs for fluoride and TDS at MW1-90 are due to a "source other than the CCR unit." Therefore, we accept the hypothesis that the fluoride and TDS concentrations observed at MW1-90 are consistent with a potential release from the Evaporation Pond, a non-CCR unit.

4 Conclusions

Five SSIs were identified from the May 2022 detection monitoring event. This report demonstrates that a "source other than the CCR unit" caused the SSIs (natural variation in regional and/or pre-landfill groundwater quality and the Evaporation Pond), as allowed by §257.94(e)(2). The results of this alternative source demonstration are summarized in Table 5 below.

Table 5 Summary of SSIs and Alternative Sources

Well	Parameter	Report Section	Evidence for Alternative Source
MW2-90	Calcium	3.2.1	Natural variation (pre-landfill values, upgradient groundwater, and geologic background)
MW3-90	Calcium	3.2.1	Natural variation (pre-landfill values, upgradient groundwater, and geologic background)
MW-80R	Chloride	3.2.2	Natural variation (pre-landfill values, upgradient groundwater, and geologic background)
MW1-90	Fluoride	3.2.3, 3.3.1	Natural variation and/or Other (Evaporation Pond, a non-CCR unit)
MW1-90	TDS	3.2.4, 3.3.1	Natural variation and/or Other (Evaporation Pond, a non-CCR unit)

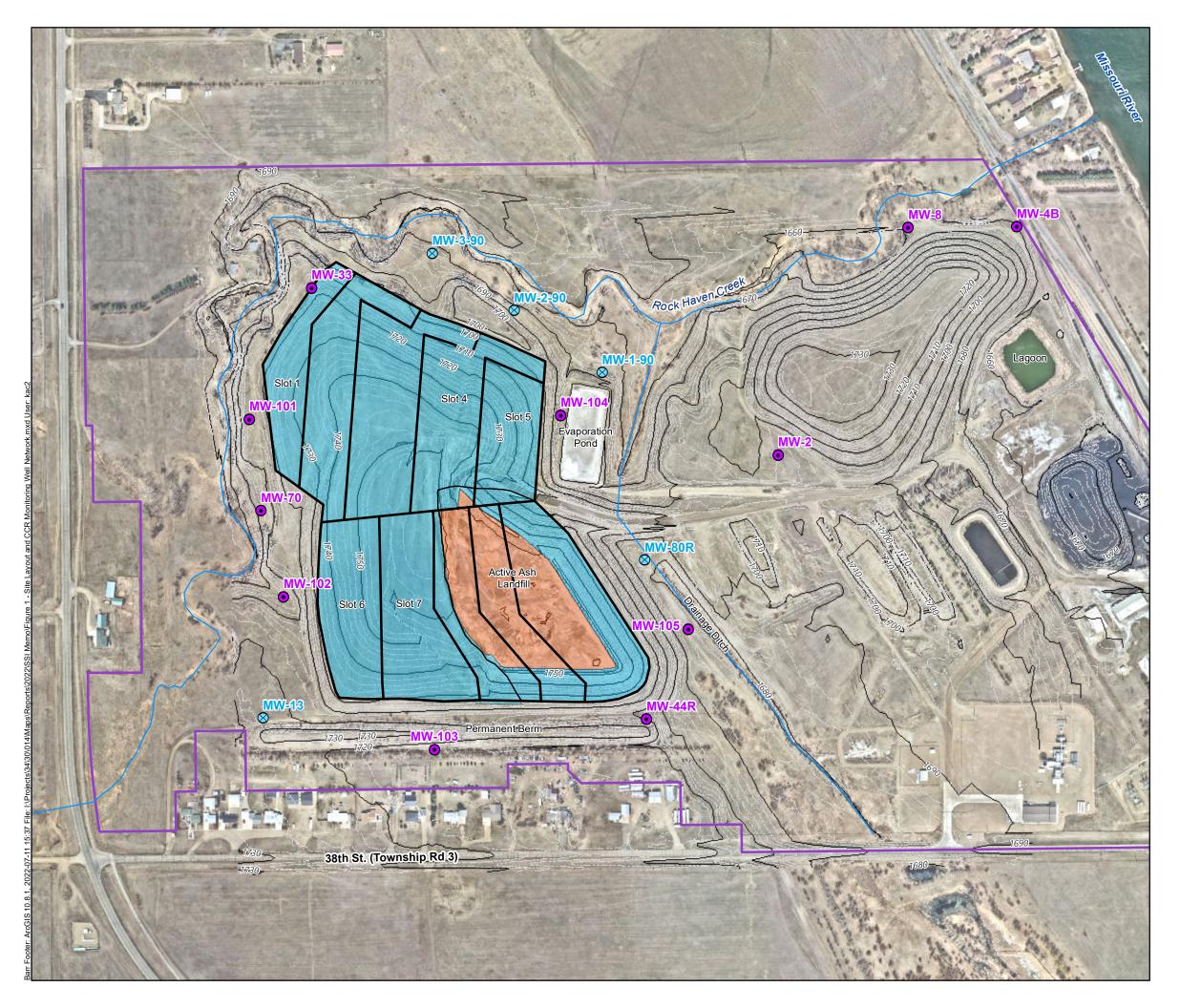
Based on the foregoing, the alternative source demonstration presented herein meets the requirements of CCR Rule §257.94(e)(2). As coal unit operations ended in early March 2022, MDU will work with the NDDEQ on closure options for the Evaporation Pond as it is regulated under a permit through the NDDEQ.

5 References

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US EPA, 2015, Hazardous and Solid Waste Management Systems; Management of Coal Combustion Residuals from Electric Utility, CFR Parts 257 and 261, Federal Register, Vol. 80, No. 74, April 17, 2015.

Figures





- Monitoring Well Location

 Monitoring Well Location Water Level Only;
 Monitoring Well Water Level Only

 Existing Slot Boundaries

 Streams

 Property Line

 10' Contour

 2' Contour

 Active CCR Landfill Limits

 Closed CCR Landfill Limits
 - CAD Data Source: Slot Linework.dwg

 Feet
 0 0 350

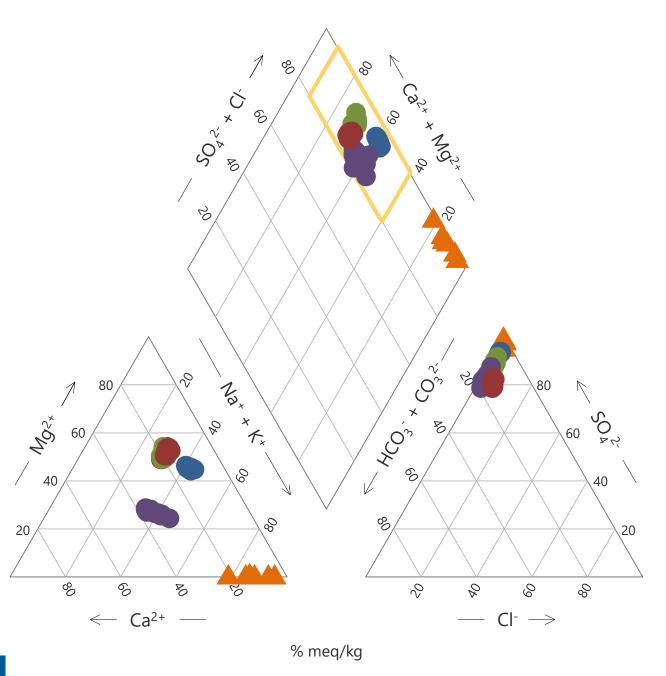
Image Source: NearMap May 2021

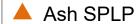


Figure 1

SITE LAYOUT AND CCR MONITORING WELL NETWORK R. M. Heskett Station

> Montana Dakota Utilities Mandan, North Dakota





MW1-90

MW2-90

MW3-90

MW80R

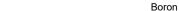
Upgradient Range

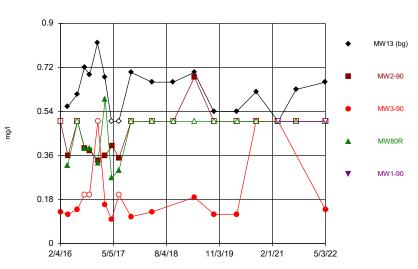
Figure 2
PIPER PLOT: ALTERNATIVE
SOURCE DEMONSTRATION
R.M. Heskett Station
Mandan, North Dakota

Appendices

Appendix A

Appendix III Time Series Plots

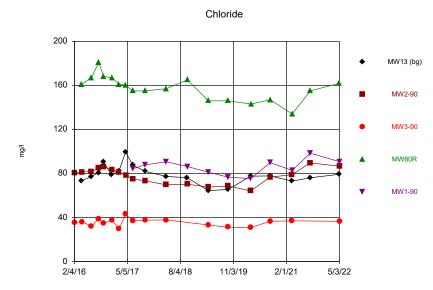




Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

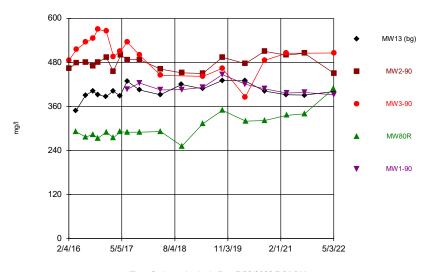
Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

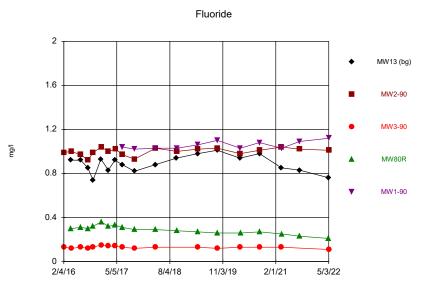
Calcium, Total



Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

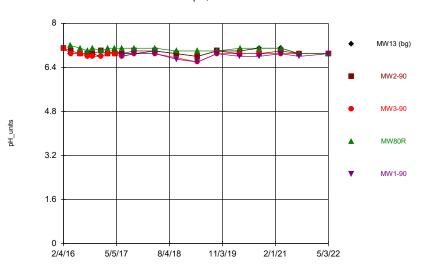


Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



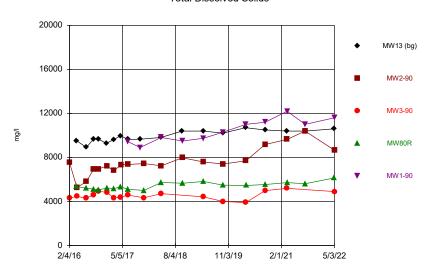


Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

Total Dissolved Solids

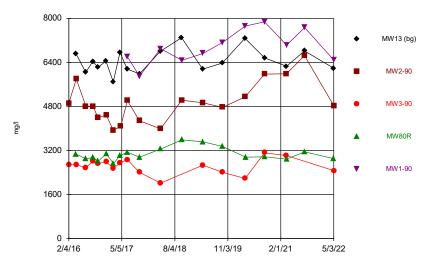


Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

Sulfate



Time Series Analysis Run 7/28/2022 7:21 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII_new

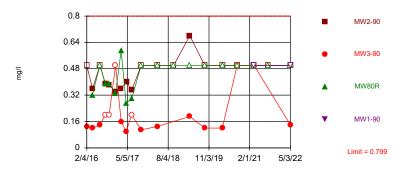
Appendix B

Prediction Limit Plots

 ${\it Sanitas}^{\tt w}\,v.9.6.32\,{\it For the statistical analyses of ground water by Barr Engineering Company only.\,{\it UG}}\,{\it Hollow symbols indicate censored values}.$

Within Limit Boron

Interwell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.6095, Std. Dev.=0.09284, n=17, 17.65% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9408, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 7/28/2022 4:53 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Chloride

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

2/4/16

5/5/17

Exceeds Limit: MW80R

Interwell Parametric 200 160 MW3-90 120 80 MW80R

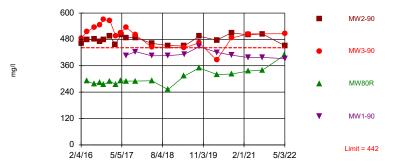
8/4/18

Background Data Summary: Mean=78.76, Std. Dev.=8.397, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9338, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

11/3/19

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

Exceeds Limit: MW2-90, MW3-90 Calcium, Total Interwell Parametric

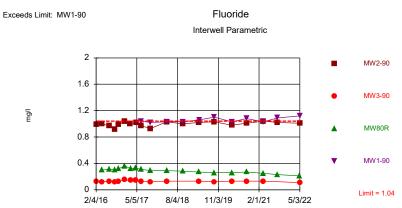


Background Data Summary: Mean=400.7, Std. Dev.=20.06, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8935, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 7/28/2022 4:53 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG



Background Data Summary: Mean=0.8953, Std. Dev.=0.06956, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9654, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 7/28/2022 4:53 PM

2/1/21

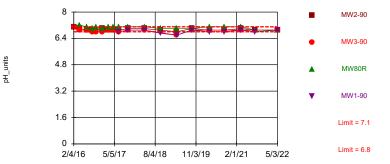
5/3/22

Limit = 95.9

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG

Within Limits pH, Field

Interwell Non-parametric

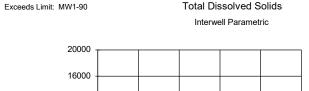


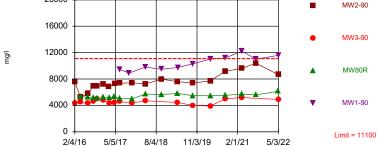
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 17 background values. Annual perconstituent alpha = 0.08687. Individual comparison alpha = 0.01107 (1 of 2). Comparing 4 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 7/28/2022 4:53 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG





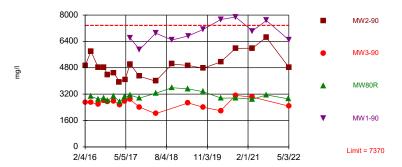
Background Data Summary: Mean=10276, Std. Dev.=332.5, n=9. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8605, critical = 0.829. Kappa = 2.447 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit

Prediction Limit Analysis Run 7/28/2022 4:53 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett SanitasAppIII new

Sanitas™ v.9.6.32 For the statistical analyses of ground water by Barr Engineering Company only. UG





Background Data Summary: Mean=6474, Std. Dev.=437, n=17. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9637, critical = 0.892. Kappa = 2.04 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Comparing 4 points to limit.

Prediction Limit Analysis Run 7/28/2022 4:53 PM
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: Heskett_SanitasAppIII_new

Prediction Limit

		R.M. Heskett Stat	ion Client: M	ontana-Dakota	a Utilities Co.	Data	: Hesk	ett_Sanitas	AppIII_new	Printed 7/28/20	22, 4:54 PM
Constituent	<u>Well</u>	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	Sig.	Bg N	%NDs	Transform	<u>Alpha</u>	Method
Boron (mg/l)	MW2-90	0.799	n/a	5/3/2022	0.5ND	No	17	17.65	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW3-90	0.799	n/a	5/3/2022	0.14	No	17	17.65	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW80R	0.799	n/a	5/2/2022	0.5ND	No	17	17.65	No	0.00188	Param Inter 1 of 2
Boron (mg/l)	MW1-90	0.799	n/a	5/3/2022	0.5ND	No	17	17.65	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW2-90	442	n/a	5/3/2022	451	Yes	17	0	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW3-90	442	n/a	5/3/2022	506	Yes	17	0	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW80R	442	n/a	5/2/2022	409	No	17	0	No	0.00188	Param Inter 1 of 2
Calcium, Total (mg/l)	MW1-90	442	n/a	5/3/2022	392	No	17	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW2-90	95.9	n/a	5/3/2022	86.6	No	17	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW3-90	95.9	n/a	5/3/2022	36.5	No	17	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW80R	95.9	n/a	5/2/2022	162	Yes	17	0	No	0.00188	Param Inter 1 of 2
Chloride (mg/l)	MW1-90	95.9	n/a	5/3/2022	90.7	No	17	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW2-90	1.04	n/a	5/3/2022	1.01	No	17	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW3-90	1.04	n/a	5/3/2022	0.11	No	17	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW80R	1.04	n/a	5/2/2022	0.21	No	17	0	No	0.00188	Param Inter 1 of 2
Fluoride (mg/l)	MW1-90	1.04	n/a	5/3/2022	1.12	Yes	17	0	No	0.00188	Param Inter 1 of 2
pH, Field (pH_units)	MW2-90	7.1	6.8	5/3/2022	6.9	No	17	0	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW3-90	7.1	6.8	5/3/2022	6.9	No	17	0	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW80R	7.1	6.8	5/2/2022	6.9	No	17	0	n/a	0.01107	NP Inter (normality) 1 of 2
pH, Field (pH_units)	MW1-90	7.1	6.8	5/3/2022	6.9	No	17	0	n/a	0.01107	NP Inter (normality) 1 of 2
Sulfate (mg/l)	MW2-90	7370	n/a	5/3/2022	4830	No	17	0	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW3-90	7370	n/a	5/3/2022	2470	No	17	0	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW80R	7370	n/a	5/2/2022	2910	No	17	0	No	0.00188	Param Inter 1 of 2
Sulfate (mg/l)	MW1-90	7370	n/a	5/3/2022	6490	No	17	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids (mg/l)	MW2-90	11100	n/a	5/3/2022	8670	No	9	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids (mg/l)	MW3-90	11100	n/a	5/3/2022	4900	No	9	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids (mg/l)	MW80R	11100	n/a	5/2/2022	6140	No	9	0	No	0.00188	Param Inter 1 of 2
Total Dissolved Solids (mg/l)	MW1-90	11100	n/a	5/3/2022	11600	Yes	9	0	No	0.00188	Param Inter 1 of 2

Appendix C

Ash SPLP Laboratory Report (2011)



1126 North Front 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 51 West Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885 www.mvtl.com



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Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.2	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	8778	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	3	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	1120	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Phenolphthalein Alk	1090	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	60	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	1060	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	4860	mg/l	NA	SM1030-F	3 Aug 11 8:40	Calculated
Total Hardness as CaCO3	524	mg/1	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	30.7	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	74.3	meg/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	74.6	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	-0.24	뭄	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	27.1		NA	USDA 20b	3 Aug 11 8:4) Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	3
Radon 222	Attached	<u> </u>			28 Jul 11 4:3	
Radium 226	Attached	pCi/l			22 Aug 11 22:2	
Radium 228	Attached	pCi/l			16 Aug 11 16:5	
Total Organic Carbon	0.7	mg/l	0.5	SM5310-C	1 Aug 11 8:0	
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:0	
Sulfate	2440	mg/l	5.00	ASTM D516-02	27 Jul 11 9:0	
Chloride	50.5	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:0	
Nitrate-Nitrite as N	0.21	mg/l	0.10	EPA 353.2	28 Jul 11 14:3	
Ammonia-Nitrogen as N	0.32	mg/l	0.10	EPA 350.1	28 Jul 11 10:4	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:0	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:0	
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:3	•
Calcium - Total	210	mg/l	1.0	6010	3 Aug 11 8:4	-
Magnesium - Total	< 2.5	mg/l	1.0	6010	3 Aug 11 8:4	
Sodium - Total	1440	mg/l	1.0	6010	3 Aug 11 8:4	4
Potassium - Total	44.8	mg/l	1.0	6010	3 Aug 11 8:4	•
Aluminum - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:3	4
Iron - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:3	4
Strontium - Total	28.2	mg/l	0.10	6010	2 Aug 11 9:3	
Titanium - Total	< 0.5	mg/l	0.10	6010	2 Aug 11 9:3	4
Boron - Total	< 0.5	mg/l	0.10	6010	11 Aug 11 8:4	0 Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2450 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Bottom Ash

Sample Site: MDU Heskett

	As Receiv Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0044	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.1135	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00164	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0065	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.0213	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0027	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.6860	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0074	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0133	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0189	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0151	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Page:

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Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
pH	11.1	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	20110	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	21	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	203	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Phenolphthalein Alk	171	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Carbonate	64	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	Claudette
Hydroxide	139	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	Claudette
Tot Dis Solids (Summation)	22500	mg/l	NA	SM1030-F	3 Aug 11 8:40	Calculated
Total Hardness as CaCO3	1200	mg/l	NA	SM2340-B	3 Aug 11 8:40	Calculated
Hardness in grains/gallon	70.2	gr/gal	NA	SM2340-B	3 Aug 11 8:40	Calculated
Cation Summation	318	meg/L	NA	SM1030-F	3 Aug 11 8:40	Calculated
Anion Summation	314	meg/L	NA	SM1030-F	28 Jul 11 14:30	Calculated
Percent Error	0.65	용	NA	SM1030-F	3 Aug 11 8:40	Calculated
Sodium Adsorption Ratio	80.9		NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	See Attacl	hed			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	< 0.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	Eric
Fluoride	< 0.1	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	CLB
Sulfate	14900	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	KMP
Chloride	2.0	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:00	KMP
Nitrate-Nitrite as N	< 0.1	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	KMP
Ammonia-Nitrogen as N	0.10	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	KMP
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	KMP
Mercury - Total	< 0.0002	mg/1	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	< 5	mg/l	5.0	HACH 8000	1 Aug 11 8:30	Wayne
Calcium - Total	481	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	6500	mq/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	459	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	1.09	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 1	mg/1	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	66.0	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	5.96	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @= Due to sample matrix != Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Duane Leingang Montana Dakota Utilities

PO Box 40

Mandan ND 58554

Page: 2 of 2

Report Date: 8 Sep 11 Lab Number: 11-M2451 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Sample Description: Unit II Sand Ash

Sample Site: MDU Heskett

	As Receiv	ed	Method RL	Method Reference	Date Analyzed	Analyst
	Result		KII	Reference	121017 200	12102/20
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.0822	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0930	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00182	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0244	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/1	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.1108	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0052	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.1000	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0136	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.0937	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.3026	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.0327	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479 Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
рн	12.9	units	N/A	SM4500 H+ B	22 Jul 11 17:00	Claudette
Specific Conductance	50660	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	Claudette
Total Suspended Solids	30	mg/l	1	SM2540-D	22 Jul 11 14:00	CLB
Total Alkalinity	7020	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Phenolphthalein Alk	6900	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	Claudette
Carbonate	240	mg/l CaCO3	4	SM2320-B	25 Jul 11 17:00	
Hydroxide	6780	mg/l CaCO3	0	SM2320-B	25 Jul 11 17:00	
Tot Dis Solids (Summation)	42200	mg/l	NA	SM1030-F	3 Aug 11 8:40	
Total Hardness as CaCO3	1750	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	102	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	663	meg/L	NA	SM1030-F	3 Aug 11 8:40	
Anion Summation	613	meg/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	3.99	8	NA	SM1030-F	3 Aug 11 8:40	
Sodium Adsorption Ratio	143		NA	USDA 20b	3 Aug 11 8:40	Calculated
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached	-			28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/1			16 Aug 11 16:50	
Total Organic Carbon	1.5	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	5.60	mg/l	0.10	SM4500-F-C	10 Aug 11 17:00	
Sulfate	22600	mg/l	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	53.8	mg/l	1.0	SM4500-Cl-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.68	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	7.22	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/l	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	Eric
Chemical Oxygen Demand	22.4	mg/1	5.0	HACH 8000	1 Aug 11 8:30	Wayne
Calcium - Total	700	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 25	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	14100	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Potassium - Total	580	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Iron - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Strontium - Total	59.5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Titanium - Total	< 5	mg/l	0.10	6010	2 Aug 11 9:30	Stacy
Boron - Total	1.89	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

Due to sample concentration
+ Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2452 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit I Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
Antimony - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Arsenic - Total	0.1128	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Barium - Total	0.0906	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Beryllium - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Cadmium - Total	0.00244	mg/l	0.00100	6020	25 Jul 11 16:18	Claudette
Chromium - Total	0.0270	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Cobalt - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Copper - Total	0.2934	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Lead - Total	0.0161	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Manganese - Total	0.0102	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Molybdenum - Total	0.9246	mg/l	0.0020	6020	26 Jul 11 12:46	Claudette
Nickel - Total	0.0175	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Selenium - Total	0.1959	mg/l	0.0020	6020	26 Jul 11 9:46	Claudette
Silver - Total	< 0.001	mg/l	0.0010	6020	25 Jul 11 16:18	Claudette
Thallium - Total	< 0.002	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Tin - Total	< 0.05	mg/l	0.0500	6020	25 Jul 11 16:18	Claudette
Vanadium - Total	0.0158	mg/l	0.0020	6020	25 Jul 11 16:18	Claudette
Zinc - Total	0.3984	mg/l	0.0100	6020	25 Jul 11 16:18	Claudette
Uranium	< 0.002	mg/l	0.002	6020	25 Jul 11 16:18	Claudette

All analyses were performed on the extract from Method 1312 (SPLP) with a modified solution to solids ratio of 4:1.

Approved by:

RL = Method Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix $\frac{1}{2}$ = Due to sample quantity

= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267



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Report Date: 8 Sep 11 Lab Number: 11-M2453 Work Order #:81-818 Account #: 013479

Date Sampled:

Date Received: 28 Jun 11 9:00

PO #: 131460 OP

Duane Leingang Montana Dakota Utilities PO Box 40 Mandan ND 58554

Sample Description: Unit II Fly Ash

Sample Site: MDU Heskett

	As Receive Result	ed	Method RL	Method Reference	Date Analyzed	Analyst
SPLP Extraction				1312	22 Jul 11	SS
На	12.8	units	N/A	SM4500 H+ B	22 Jul 11 17:00	
Specific Conductance	27240	umhos/cm	N/A	SM2510-B	22 Jul 11 17:00	
Total Suspended Solids	13	mg/l	1	SM2540-D	22 Jul 11 14:00	
Total Alkalinity	4570	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Phenolphthalein Alk	4520	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Bicarbonate	< 4	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Carbonate	100	mg/l CaCO3	4	SM2320-B	22 Jul 11 17:00	
Hydroxide	4470	mg/l CaCO3	0	SM2320-B	22 Jul 11 17:00	
Tot Dis Solids (Summation)	16000	mg/l	NA	SM1030-F	3 Aug 11 8:40	4
Total Hardness as CaCO3	1960	mg/l	NA	SM2340-B	3 Aug 11 8:40	
Hardness in grains/gallon	115	gr/gal	NA	SM2340-B	3 Aug 11 8:40	
Cation Summation	252	meq/L	NA	SM1030-F	9 Aug 11 9:09	
Anion Summation	247	meq/L	NA	SM1030-F	28 Jul 11 14:30	
Percent Error	1.00	8	NA	SM1030-F	9 Aug 11 9:09	
Sodium Adsorption Ratio	46.1		NA	USDA 20b	3 Aug 11 8:40	
Gross Alpha Radiation	Attached	pCi/l			22 Aug 11 2:03	
Radon 222	Attached				28 Jul 11 4:37	
Radium 226	Attached	pCi/l			22 Aug 11 22:20	
Radium 228	Attached	pCi/l			16 Aug 11 16:50	
Total Organic Carbon	1.6	mg/l	0.5	SM5310-C	1 Aug 11 8:00	
Fluoride	3.60	mg/l	0.10	SM4500-F-C	4 Aug 11 17:00	
Sulfate	7400	mg/1	5.00	ASTM D516-02	27 Jul 11 9:00	
Chloride	66.0	mg/l	1.0	SM4500-C1-E	27 Jul 11 14:00	
Nitrate-Nitrite as N	0.38	mg/l	0.10	EPA 353.2	28 Jul 11 14:30	
Ammonia-Nitrogen as N	15.0	mg/l	0.10	EPA 350.1	28 Jul 11 10:45	
Phosphorus as P - Total	< 0.1	mg/1	0.10	EPA 365.1	28 Jul 11 13:00	
Mercury - Total	< 0.0002	mg/l	0.0002	EPA 245.1	28 Jul 11 8:00	
Chemical Oxygen Demand	9.4	mg/l	5.0	HACH 8000	1 Aug 11 8:30) Wayne
Calcium - Total	785	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Magnesium - Total	< 5	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Sodium - Total	4720	mg/l	1.0	6010	3 Aug 11 8:40	4
Potassium - Total	275	mg/l	1.0	6010	3 Aug 11 8:40	Stacy
Aluminum - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	-
Iron - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	
Strontium - Total	85.0	mg/l	0.10	6010	9 Aug 11 9:09	Stacy
Titanium - Total	< 1	mg/l	0.10	6010	9 Aug 11 9:09	
Boron - Total	< 1	mg/l	0.10	6010	11 Aug 11 8:40	Stacy

RL = Method Reporting Limit

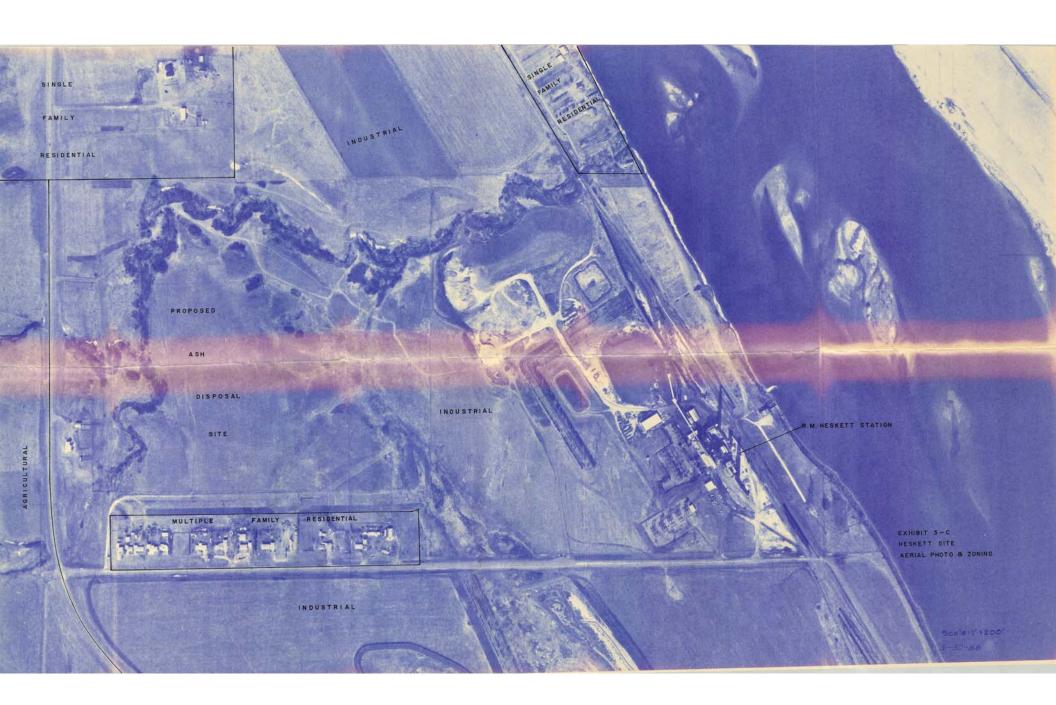
Elevated "Less Than Result" (<): @ = Due to sample matrix ! = Due to sample quantity

= Due to sample concentration + = Due to extract volume

CERTIFICATION: MN LAB # 038-999-267

Appendix D

Aerial Photo (March 30, 1998)



Appendix E Boring Logs

EXHIBIT 5-E

LITHOLOGIC LOGS

- Wells 10, 11, 12 and 13

 O-1 Top soil, silty, clayey, sandy, brown, calcareous; with some limestone pebbles.
- 1-11 Silt, clayey, brownish-tan, slightly indurated, very dry, calcareous; with thin coarse-grained, clean silt lenses and a few small (less than .5 in.) iron oxide concretions. Abundant small gypsum crystals (less than .13 in. long). Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- Silt, as above, with some (less than 20%) very fine- to fine-grained sand interspersed.
- Silt, as above, clayey, less sand than above interval, oxidized; with very fine-grained silty sand lenses and very few gypsum crystals.
- 30-41 Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with fewer small gypsum crystals than above intervals.
- Silt, as above, very clayey, with some (less than 20%) fine- to medium-grained sand interspersed in a silt and clay matrix.
- 59-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- Silt, clayey, steel-gray to bluish, moderately indurated; with thin coarse-grained silt to very fine-grained sand lenses in an otherwise fine silt to clay matrix.
- 81-84 Clay, silty, steel-gray to bluish, moderately indurated, dense.
- Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- 91-110 Silt, clayey, bluish-gray, moderately indurated; with thin (less than 1 foot) mudstone lenses.
- 110-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.

Wells 20 and 21

- 0-1 Top soil, silty, sandy, clayey, dark-brown, calcareous; with some limestone and granite pebbles.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- 21-26 Silt, as above, steel-gray (color change).
- Silt, clayey, with some (less than 20%) very fine- to medium-grained sand interspersed, steel-gray to bluish, slightly indurated; with very few small gypsum crystals and some thin (less than 1 foot) siltstone lenses.
- 49-53 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 53-63 Silt, as above, clayey, less sand, with thin (less than 1 foot) siltstone to mudstone lenses.
- Silt, very clayey, steel-gray to bluish, moderately indurated, very dense.
 Cannonball-Ludlow Formations.

Wells 30, 31, 32 and 33

- 0-1 Top soil, silty, sandy, brownish, calcareous; with some granite and limestone pebbles.
- 1-2 Pebble-loam (glacial till), silty, sandy, clayey, yellowish-brown, dry, calcareous.
- 2-31 Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions.

 Some small, black flakes organic plant material. Cannonball-Ludlow Formations.
- Silt, clayey, steel-gray (color change), slightly indurated, calcareous; with small iron oxide concretions, thin coarse silt lenses, small gypsum crystals and gray to reddish-brown mottling.

- Silt, as above, with some (less than 20%) fineto medium-grained sand interspersed.
- 61-65 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed, dense.
- Silt, as above, clayey, less sand, some thin (less than 1 foot) lenses of siltstone to mudstone.
- 76-80 Siltstone, sandy, clayey, steel-gray to bluish, slightly indurated; with small fine-grained sand lenses and abundant (more than 20%) fine-grained sand interspersed in the matrix.
- 80-92 Silt, clayey, steel-gray to bluish, moderately indurated, with some (less than 20%) very fine- to fine grained sand interspersed.
- 92-120 Silt, very clayey, steel-gray to bluish, moderately indurated, very dense. Cannonball-Ludlow Formations.
- Well 40
 0-1
 Top soil, sandy, silty, brownish-tan, calcareous; with some granite and limestone pebbles.
- Pebble-loam (glacial till), sandy, silty, with detrital lignite and organic matter, yellowish-brown, very dry, calcareous.
- 5-22 Sand, very fine- to medium-grained, unconsolidated, with thin lenses of clay and detrital lignite, brownish-yellow, calcareous.
- 22-40 Silt, clayey, with minor amounts (less than 10%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, oxidized; with small iron oxide concretions and small gypsum crystals; Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.

- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.
- 70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.
- 80-120 Silt, as above, dark-steel-gray. Cannonball-Ludlow Formations.

Wells 41, 42 and 43

- O-1 Top soil, sandy, silty, dark-brown, calcareous; with some granite and limestone pebbles.
- 1-4 Pebble-loam (glacial till), sandy, silty, clayey, yellowish-brown, very dry, calcareous.
- Silt, clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, unconsolidated, noncompacted, calcareous to 25 feet, oxidized; with small iron oxide concretions and abundant small gypsum crystals.

 Cannonball-Ludlow Formations.
- Silt, clayey, with minor amounts (less than 10%) of very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with some reddish-brown mottling and some very thin (less than 6 inches) mudstone lenses.
- 51-58 Silt, as above, with abundant (more than 20%) fine-grained sand and thin silty-clay lenses.
- 58-62 Siltstone, sandy, clayey, steel-gray to bluish, moderately indurated; with small fine-grained sand lenses and abundant (more than 20%) sand interspersed in the matrix.
- Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with thin (less than 2 feet) sandy lenses.

70-80 Silt, as above, very clayey, some (less than 10%) fine-grained sand interspersed; less sand than above interval.

Wells 43 and 44

- O-2 Top soil, clayey, silty, some sand, brownish-tan to light-gray, calcareous.
- 2-20 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, slightly indurated, very dry, calcareous; with small iron oxide concretions, abundant small gypsum crystals and occasional thin silt lenses. Cannonball-Ludlow Formations.
- Silt, as above, very clayey, oxidized, with minor amounts (less than 10%) of fine-grained sand.
- 25-35 Silt, as above, dark-brownish-tan to bluish-gray (color change), with thin very fine-grained sand lenses.
- 35-60 Silt, clayey, with some (less than 20%) fine- to medium-grained sand interspersed, steel-gray to bluish, moderately indurated; with some indurated silty sand lenses. Cannonball-Ludlow Formations.

Wells 50, 51 and 52 0-4 Top soil, clayey, silty, very dark-brown.

- 4-10 Clay, silty, with some (less than 20%) fine-grained sand, dark-brownish-tan, soft, cohesive, wet, sticky; with some pebbles.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, brownish-tan, slightly indurated, calcareous, dense; with abundant small gypsum crystals and very thin silt and sand lenses; Cannonball-Ludlow Formations.
- 22-23 Sandstone, fine-grained, silty, indurated, oxidized, dark-brown.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin medium grained sand lenses.

30-40 Silt, as above, very clayey, less sand than above interval, dark-steel-gray.
Cannonball-Ludlow Formations.

Wells 53 and 54 0-4 Top soil, clayey, silty, very dark-brown, wet, sticky.

- 4-15 Clay, silty, with some (less than 20%) fine- to medium-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional reddish-brown mottling; Cannonball-Ludlow Formations.
- Sand, very fine-grained to medium-grained, silty, clayey, unconsolidated, yellowish-brown, oxidized.
- 20-30 Silt, clayey, with some (less than 20%) fine-grained sand interspersed, steel-gray (color change), slightly indurated; with clay and sand lenses, some small concretions and some small gypsum crystals.
- 30-45 Silt, as above, very clayey.
- 45-60 Silt, as above, clayey, brownish-gray, moderately indurated, some reddish-brown mottling.
 Cannonball-Ludlow Formations.

Wells 55 and 56

- O-5 Sandy-loam (glacial), with fine- to medium-grained sand, silty, calcareous; with small granite and limestone pebbles.
- Clay, silty, with minor amounts (less than 10%) of very fine-grained sand, dark-brownish-tan, moderately indurated, brittle, very dry, calcareous; with small iron oxide concretions, small gypsum crystals and occasional thin sandstone laminae. Some small, black flakes of organic plant material. Cannonball-Ludlow Formations.
- 26-35 Clay, as above, very silty, sandy, brownish-tan, oxidized.

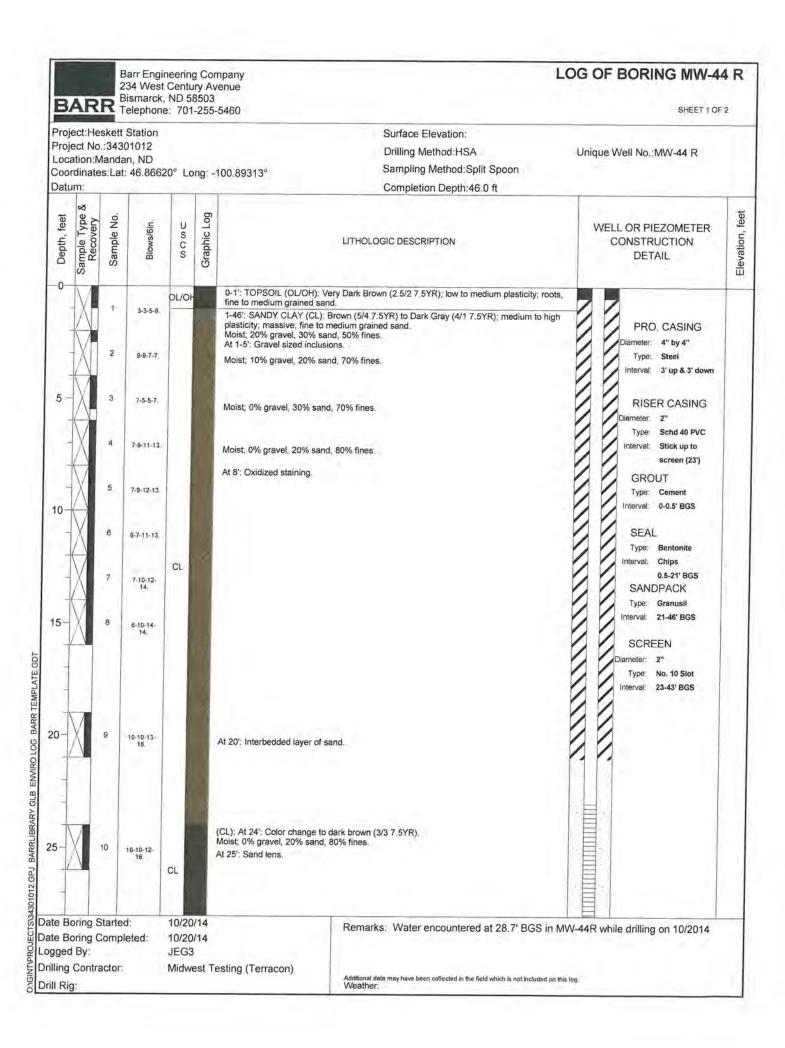
- Silt, clayey, with some (less than 20%) very fine- to fine-grained sand interspersed, steel-gray (color change) moderately indurated; with small gypsum crystals and occasional clay lenses.
- Silt, as above, with minor amounts (less than 10%) of fine-grained sand interspersed.
- 60-85 Silt, as above, clayey, less sand than above interval.
- 85-100 Silt, as above, very clayey, with minor amounts (less than 10%) of sand interspersed, light-gray. Cannonball-Ludlow Formations.
- Wells 60, 61 and 62 0-2 Top soil, silty, clayey, dark-brown to tanish-brown, calcareous.
- 2-25 Silt, very clayey, with some minor amounts (less than 10%) of very fine- to fine-grained sand interspersed, brownish-tan, slightly indurated, dry, calcareous; with abundant small gypsum crystals and thin silt and sand lenses; Cannonball-Ludlow Formations.
- 25-29 Silt, as above, with abundant (more than 20%) fine- to medium-grained sand interspersed.
- 29-36 Silt, as above, clayey, less sand than above interval, dark-brownish-tan, oxidized.
- Silt, very clayey, with some (less than 20%) very fine-grained sand interspersed, steel-gray (color change), moderately indurated; with thin (less than 1 foot) sandy-silt lenses.

 Cannonball-Ludlow Formations.
- Well 70 0-2 Pebble-loam (glacial till), clayey, sandy, yellowish-brown, unconsolidated, damp, calcareous.
- 2-21 Silty, clayey, with some (less than 20%) fine-grained sand interspersed, brownish-tan, moderately indurated, very dry, calcareous, oxidized; with small iron oxide concretions and abundant small gypsum crystals. Cannonball-Ludlow Formations.

21-24	Shale, silty, steel- to dark-gray (color change), indurated, fissile, very dry; with occasional thin silt and sand lenses.
24-31	Silt, clayey, with abundant (more than 30%) sand, steel-gray, moderately indurated.
31-62	Silt, clayey, with some (less than 20%) very fine- to fine- grained sand interspersed, steel-gray, moderately indurated; with some small gypsum crystals and small iron oxide concretions.
62-76	Silt, as above, with some (less than 20%) fine-grained sand interspersed.
76-82	Silt, as above, with abundant (more than 20%) fine- to medium-grained sand.
82-100	Silt, as above, clayey, with some (less than 20%)
	fine-grained sand interspersed, dark-gray. Cannonball-Ludlow Formations.

The lithologic logs for wells 1-4 were described by personal from Water Supply Incorporated (WS), Bismarck, North Dakota. The wells were installed during a previous ground water investigation at Heskett Station.

Well WS 2	
0-1	Top soil, silty, black.
1-4	Pebble-loam (glacial till), silty, clayey, some
	cobbles, yellowish-brown.
4-7	Gravel, sand and rocks.
7-21	Sand, fine- to coarse-grained, some pebbles.
21-39	Clay silty sandy vollowish brown to annu
39-52	Clay, silty, sandy, yellowish-brown to gray.
52-67	Clay, silty, sandy, gray.
32-07	Sand, fine-grained, bluish, with some clay
67-89	Clay cilty candy because
07-05	Clay, silty, sandy, brown to gray.
Wells WS 1, 1	A and IP
0-1	
1-4	Top soil, silty, black
1,74	Clay, (glacial), silty, with pebbles,
4-21	yellowish-brown.
4-21	Sand, fine- to medium-grained, yellowish-brown;
21 20	with clay and silt lenses.
21-25	Clay, silty, yellowish-brown.
25-30	Sand, fine-grained, yellowish-brown, some
	indurated layers.
30-35	Clay, silty, yellowish-brown.
35-45	Sand, fine-grained, yellowish-brown.
45-50	Clay, silty, sandy, gray, about 50 percent shale.
50-56	Sand, fine-grained, with clay layers.
56-73	Clay, silty, sandy, gray.
WE11s WS 4, 4	A and 4B
0-13	Pebble-loam (glacial till), silty, sandy, with
	some cobbles, yellowish-brown.
13-23	Sand, fine- to medium-grained, yellowish-brown.
23-25	Slay, silty, sandy, yellowish-brown.
25-27	Sandstone, indurated.
27-30	Clay, sandy, silty, gray.
30-36	Sand, fine-grained, gray.
36-52	
	Clay, silty, sandy, gray; with some sand layers.
Wells WS 3 and	4 3Δ
0-1	
1-12	Top soil, silty, black.
1.12	Pebble-loam, clayey, silty, with some cobbles,
12-16	yellowish-brown.
16-18	Clay, silty, gray; with some shale layers.
	Limestone, indurated.
18-23	Clay, silty, yellowish-brown; with some sand
00:44	layers.
23-44	Sand, fine- to medium-grained, gray; with some
44.50	clay layers.
44-50	Clay, silty, medium-gray.



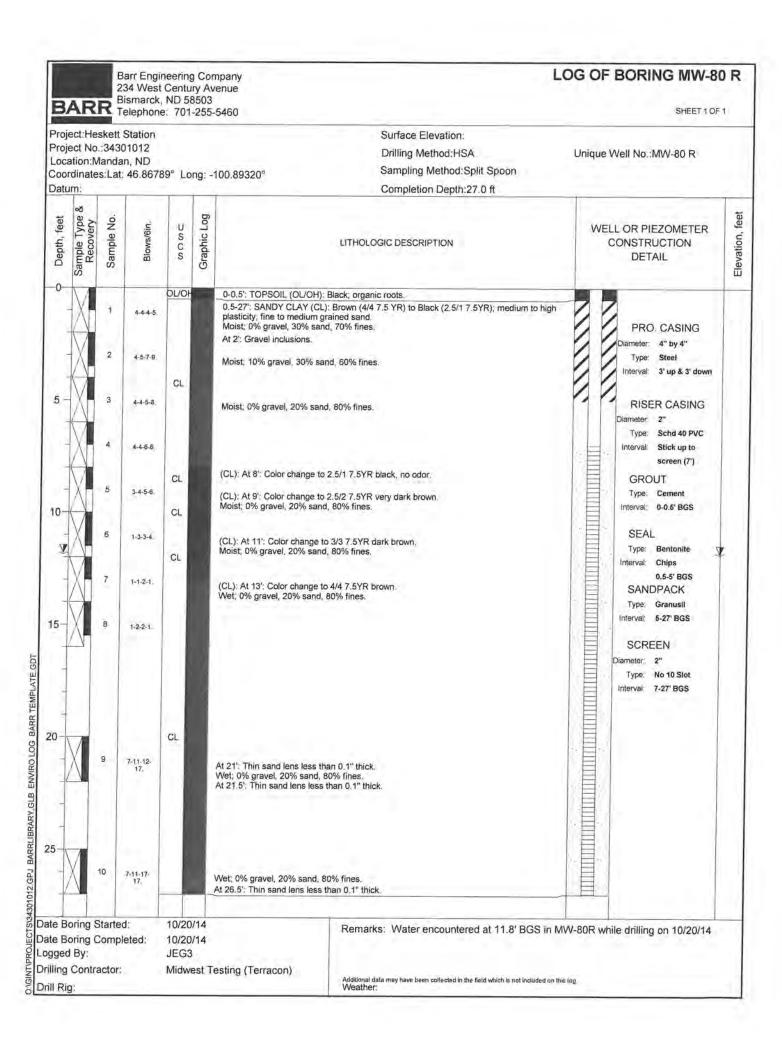
			Barr Engi 234 Wes Bismarck	t Centi	ury Av	npany enue	LOC	G OF	BORING MW-4
	AR	R	Telephon	e: 70°	1-255				SHEET 2 OF
Proje Loca	ect No ation:N dinate	.:343 Manda	Station 01012 an, ND t: 46.866	20° Lo	ong: -	Surface Elevation: Drilling Method:HSA 100.89313° Sampling Method:Split S Completion Depth:46.0	Spoon	Inique	Well No.:MW-44 R
Depth, feet	Sample Type & Recovery	Sample No.	Blows/6in.	2000	Graphic Log	LITHOLOGIC DESCRIPTION			LL OR PIEZOMETER CONSTRUCTION DETAIL
30-	-	11	8-12-14- 18. 8-13-16- 27.	CL		(CL): At 24': Color change to dark brown (3/3 7.5YR). (continued) Wet; 0% gravel, 20% sand, 80% fines. At 30.5': Sand lens. (CL): At 32': Color change to dark gray (4/1 7.5YR).			PRO. CASING Diameter. 4" by 4" Type: Steel Interval: 3' up & 3' down RISER CASING Diameter. 2" Type: Schd 40 PVC Interval: Stick up to screen (23') GROUT Type: Cement Interval: 0-0.5' BGS
40	X	13	11-19-25- 27.	\ <u>SC</u> /		(SC): At 45.8°. Clayey Sand (SC), fine to medium grained, low to mediu greenish gray (4/10G Gley 2).	m plasticity, dark		Type: Bentonite Interval: Chips 0.5-21' BGS SANDPACK Type: Granusil Interval: 21-46' BGS SCREEN Diameter: 2" Type: No. 10 Stot Interval: 23-43' BGS
55-									
te Bo gged	By: Contr	Comp	oleted:	10/20 10/20 JEG: Midw	0/14 3	Remarks: Water encountered at esting (Terracon) Additional data may have been collected in the field weather:		44R wh	nile drilling on 10/2014

State of North Dakota

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well. 1. WELL OWNER Well head completion: 24" above grade _____ Other ____ x Name MDU-Heskett Station If other, specify 4" x 4" x 5' steel cover 2025 38th Street Address Was protective casing installed? ■ Yes □ No Mandan, North Dakota Was well disinfected upon completion? □ Yes ■ No 2. WELL LOCATION (MW-44R) Address (if in city) (see attached drawing) 5. WATER LEVEL Static water level 28.5 feet below surface If flowing: closed in pressure _____ psi or ft. above land surface Morton County _____ SE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W. 6. WELL LOG Depth (Ft.) Lat. 46.86620 Long.: -100.89313 Altitude:_____ Formation From To 3. METHOD DRILLED Topsoil 0.5 Auger Other 0.5 Sandy lean clay 5 4. WELL CONSTRUCTION 5 Sandy fat clay 46 Diameter of Hole 8 inches Depth 46 feet Riser: ■ PVC □ Other ■ Threaded □ Solvent □ Other Riser rating SDR _____ Schedule _____40 Diameter 2.0 inches From ____ +2 ___ ft. to ___ 23 ft. Was a well screen installed? ■ Yes □ No Material Schedule 40 PVC Diameter 2.0 inches Slot Size <u>#10</u> set from <u>23</u> feet to <u>43</u> feet (Use separate sheet if necessary) Sand packed from 21 ft to 46 ft 7. WAS THE HOLE PLUGGED OR ABANDONED? Depth grouted from 1 ft to 21 ft □ Yes ■ No Grouting Material If so, how? _____ Bentonite ____x Other____ If other explain: One foot concrete collar at surface 8. REMARKS 3 steel bumpers installed around well head 9. DATE COMPLETED 10-21-14 10. CONTRACTOR CERTIFICATION This well was drilled under my jurisdiction and this report is true to the best of my knowledge. Midwest Testing Laboratory, Inc. Monitoring Well Contractor Certificate No. P.O. Box 2084, Bismarck, ND 58502-2084 Address 10-22-14



State of North Dakota

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD • BISMARCK, NORTH DAKOTA 58505

MONITORING WELL REPORT

State law requires that this report be filed with the State Board of Water Well Cont	
1. WELL OWNER	Well head completion:
Name MDU-Heskett Station	24" above grade Other x
Address 2025 38 th Street	If other, specify 4" x 4" x 5' steel cover
	Was protective casing installed? ■ Yes □ No
Mandan, North Dakota	Was well disinfected upon completion? ☐ Yes ■ No
2. WELL LOCATION (MW-80R)	
Address (if in city) (see attached drawing)	5. WATER LEVEL
	Static water level 12 feet below surface
County	If flowing: closed in pressure psi or ft. above land surface
NE ¼ SE ¼ SW ¼ Sec. 10 Twp. 139 N. Rge. 81 W.	6. WELL LOG Depth (Ft.)
Lat. <u>46.86789</u> Long.: <u>-100.89320</u>	
Altitude:	Formation From To
3. METHOD DRILLED	Topsoil 0 0.5
■ Auger Other	Sandy lean clay 0.5 27
4. WELL CONSTRUCTION	Sality leaf clay 0.5 2/
Diameter of Hole 8 inches Depth 27 feet	
Riser: ■ PVC □ Other	
■ Threaded □ Solvent □ Other	
Riser rating SDR Schedule40	
Diameter 2.0 inches	
From+2.5ft. to7ft.	
Was a well screen installed? ■ Yes □ No	
Material Schedule 40 PVC Diameter 2.0 inches	
Slot Size #10 set from 7 feet to 27 feet	(Use compared about if accessing)
Sand packed from5ft toft	(Use separate sheet if necessary)
Depth grouted from 1 ft to 5 ft	7. WAS THE HOLE PLUGGED OR ABANDONED?
Grouting Material	□ Yes ■ No
Bentonitex Other	If so, how?
If other explain:	
One foot concrete collar at surface	8. REMARKS
	3 steel bumpers installed around well head
	9. DATE COMPLETED 10-21-14
	10. CONTRACTOR CERTIFICATION
	This well was drilled under my jurisdiction and this report is true to the
	best of my knowledge. Midwest Testing Laboratory, Inc. 444
	Monitoring Well Contractor Certificate No.
	P.O. Box 2084, Bismarck, ND 58502-2084
	Address
	M/ // 10-22-14
	Signature Date



LOG OF BORING MW-101 DRAFT

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum:NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No U S C S WELL OR PIEZOMETER Blows/6in Elevation, Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 4-4-4-6 SANDY LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); PRO. CASING 1715 moist; thinly laminated; some mottling; low plasticity; [Cannonball Formation]. iameter: 4" At 2': Start to see gravel inclusions. Type: Steel pipe 4-6-6-7 Interval: 3.5' ags - 1.5' bgs At 4': Oxidized staining. RISER CASING 5 7-9-14-16 At 5': Oxidized staining. Type: PVC SCH 80 Interval: 2.98' ags - 34' 1710⁻ bgs 8-9-12-15. At 7': Oxidized staining and white staining. **GROUT** Type: Neat cement Interval: 0 - 29' bgs 5 10-15-21-26. **SEAL** 10 Type: Bentonite chips Interval: 29 - 32' bgs CL 7-18-24-At 11': Oxidized staining. 1705 **SANDPACK** Type: Silica 40-70 8-12-19-23. Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 8-14-18-23. At 15': Gypsum. Type: PVC SCH 80 Interval: 34 - 54' bgs 16-20': No recovery. 1700 20 At 20.5': Gypsum. 7-10-13-15. LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to 1695· high plasticity; [Cannonball Formation]. At 22': Color change to Brown (4/2 7.5YR). 10 7-9-13-15. CL At 24': Interbedded sand, fine grained. Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



LOG OF BORING MW-101

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum: NAD 83 Completion Depth:58.0 ft feet Sample Type & Recovery Graphic Log feet Sample No WELL OR PIEZOMETER USCS Blows/6in Elevation, Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); oxidized staining, some mottling; medium to high plasticity; [Cannonball Formation]. (continued) At 25' and 25.5': Gypsum. PRO. CASING 1690 At 26.5': Gypsum. 12 8-11-15-19. iameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 13 8-11-13-15. RISER CASING At 29.5': Gypsum. 30 meter: 2" CL Type: PVC SCH 80 14 6-11-14-17. 2.98' ags - 34' Interval: 1685⁻ bgs **GROUT** 15 8-13-17-22. Type: Neat cement At 33': Gypsum. Interval: 0 - 29' bgs 1 At 34.5': Gypsum. **SEAL** 35 8-14-19-21. Type: Bentonite chips At 35.5-36': Color change to Black (2.5/1 7.5YR), turns back to brown. Interval: 29 - 32' bgs FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball 1680· Formation]. **SANDPACK** 17 11-16-20-27 Type: Silica 40-70 Interval: 32 - 56' bgs At 38': Oxidized staining. 18 9-13-20-25. **SCREEN** Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 34 - 54' bgs 19 7-14-23-26. At 41': Oxidized staining. 1675 9-16-23-45 1670 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. Date Boring Completed: 8/19/15 DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) M:\GINT\PRO. Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-101 DRAFT

BARR Telephone: 952-832-2600 SHEET 3 OF 3 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1716.6 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438844.919° Long: 1868647.777° Datum: NAD 83 Completion Depth:58.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** -50 FAT CLAY (CH): Black (2.5/1 7.5YR); very stiff; hight plasticity; wet at 43'; [Cannonball Formation]. (continued) PRO. CASING 1665 Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 55 Diameter: 2" Type: PVC SCH 80 Interval: 2.98' ags - 34' 1660· bgs **GROUT** Type: Neat cement End of boring 58.0 feet Interval: 0 - 29' bgs **SEAL** 60 Type: Bentonite chips Interval: 29 - 32' bgs SANDPACK Type: Silica 40-70 Interval: 32 - 56' bgs **SCREEN** Diameter: 2"; No.6 slot 65 Type: PVC SCH 80 Interval: 34 - 54' bgs 70 Date Boring Started: 8/18/15 Remarks: Hole caved in from 56 - 58' bgs. DTW = 36.66' TOR on 9/23/2015 (elev. 1682.87) Date Boring Completed: 8/19/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



LOG OF BORING MW-102

SHEET 1 OF 2

Project:R.M. Haskett Station CCR Monitoring Network

Project No.:34300014.12

Surface Elevation:1703.8 ft Drilling Method: HSA

Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum: NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet ž WELL OR PIEZOMETER USCS Blows/6in Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 3-3-3-2 LEAN CLAY (CL): medium grained; Brown (4/3 7.5YR); moist; low to medium plasticity; PRO. CASING with gravel to 4'; [Cannonball Formation]. ameter: 4" Type: Steel pipe 3-2-2-3 Interval: 3.5' ags - 1.5' 1700bgs RISER CASING 3 CL 3-3-4-5 2" Type: PVC SCH 80 2.85' ags - 10' Interval: bgs 3-4-5-7 **GROUT** Type: None Interval: None 1695⁻ 4-8-7-4 SANDY SILT WITH GRAVEL (ML): Strong Brown (5/6 7.5YR); fine to coarse sand, fine to ML medium gravel, unconsolidated; [Cannonball Formation]. **SEAL** 10 LEAN CLAY WITH GRAVEL (CL): fine to medium grained; Brown (5/3 7.5YR); some Bentonite chips Type: mottling; medium plasticity; [Cannonball Formation]. Interval: 0 - 8' bgs CI 4-3-5-9 **SANDPACK** LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Type: Silica 40-70 Formation] Interval: 8 - 31' bgs 3-5-7-9 1690· **SCREEN** $\sqrt{}$ Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 6-8-12-14 Type: PVC SCH 80 Interval: 20 - 30' bas 6-10-12-16 CL 1685 10 5-9-14-16 20 5-12-15-18. At 21': Color changes to Black (2.5/1). 12 9-15-18-22. 1680-Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. Logged By:

JEG3 Drilling Contractor: Terracon

Rig mounted HSA

Drill Rig:

DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51

Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

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Drill Rig:

Rig mounted HSA

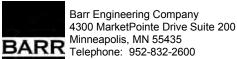
LOG OF BORING MW-102

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1703.8 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438161.145° Long: 1868782.871° Datum: NAD 83 Completion Depth:46.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 9-14-19 LEAN CLAY (CL): Dark Brown (3/2 7.5YR); medium to high plasticity; [Cannonball Formation]. (continued) PRO. CASING 14 10-17-18-24. Diameter: 4" Type: Steel pipe Interval: 3.5' ags - 1.5' 1675 bgs 15 6-15-18-At 29': Gypsum. RISER CASING 30 Diameter: 2" Type: PVC SCH 80 16 7-14-18-22. Interval: 2.85' ags - 10' bgs **GROUT** 17 11-16-20-27. Type: None Interval: None At 33.5' and 34': Gypsum. 1670· CL **SEAL** 35 10-14-15-24 Type: Bentonite chips Interval: 0 - 8' bgs **SANDPACK** 19 13-19-25-35. Type: Silica 40-70 Interval: 8 - 31' bgs 1665⁻ 20 8-17-26-31. **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 20 - 30' bgs 21 10-20-27-38. 22 13-20-27-37. 1660 SILTY SAND (SM): fine to medium grained; Dark Gray (4/1 7.5YR); wet; [Cannonball Formation1. 45 23 SM 15-27-27-32. End of boring 46.0 feet Date Boring Started: 8/18/15 Remarks: Lithological descriptions for a hole that was abandoned. Monitoring well Date Boring Completed: 8/18/15 blind drilled and installed next to abandoned hole. DTW = 17.09' TOR on 8/21/2015 (elev. 1689.51 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather:

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435 BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 Project No.:34300014.12

LOG OF BORING MW-103

SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum: NAD 83 Completion Depth:44.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL (OL/OH): Brown (5/4 7.5YR). DL/OH 3-4-5-5 LEAN CLAY (CL): Very Dark Gray (3/1 7.5YR); moist; stiff; medium to high plasticity; PRO. CASING [Cannonball Formation]. iameter: 4" Type: Steel pipe 5-5-8-8 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 1710 5-8-10-11 Type: PVC SCH 80 2.79' ags - 24' Interval: bgs 6-9-15-15. POORLY GRADED SAND WITH GRAVEL (SP): fine to coarse grained; Brown (5/4 **GROUT** 7.5YR); some oxidized staining, some mottling; [Cannonball Formation]. Type: Neat cement Interval: 0 - 19' bgs 5-6-5-4 SP **SEAL** 1705 10 Type: Bentonite chips Interval: 19 - 22' bgs 4-5-5-7 **SANDPACK** POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; Brown (5/4 Type: Silica 40-70 7.5YR); [Cannonball Formation]. Interval: 22 - 44' bgs 2-2-2-3 SP-**SCREEN** SM 1700 Diameter: 2"; No.6 slot JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 15 3-3-3-3 Type: PVC SCH 80 Interval: 24 - 44' bas NO RECOVERY (16 - 20'). 1695 20 SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. 3-3-5-5 CL 1690· Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-103

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation:1714.7 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 437578.205° Long: 1869355.992° Datum: NAD 83 Completion Depth:44.0 ft Elevation, feet Sample Type & Recovery Graphic Log feet Sample No U S C S WELL OR PIEZOMETER Blows/6in Depth, 1 LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** SANDY LEAN CLAY (CL): fine to medium grained; Light Brown (6/4 7.5YR); wet; some mottling and oxidized staining, cohesive; low to medium plasticity; [Cannonball Formation]. (continued) 2-2-4-4 PRO. CASING Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs RISER CASING 1685 30-Diameter: 2" SILTY SAND WITH GRAVEL (SM): wet; [Cannonball Formation]. SM Type: PVC SCH 80 10-10-7-9. LEAN CLAY (CL): Brown (4/4 7.5YR); moist; oxidized staining; medium to high plasticity; Interval: 2.79' ags - 24' [Cannonball Formation]. bgs **GROUT** At 32.5': Sand lens, color changes to Black (2.5/1 7.5YR). 12 8-15-17-22. Type: Neat cement Interval: 0 - 19' bgs At 33.5': Sand lens. At 34': Interbedded sand with oxidized staining. **SEAL** 1680-35 13 7-19-15-Type: Bentonite chips Interval: 19 - 22' bgs At 36.5': Sand lens. **SANDPACK** 11-16-21-50 for 5". At 37': Sand lens. CI Type: Silica 40-70 At 37.5': Color change to Gray (5/1 7.5YR). Interval: 22 - 44' bgs At 38-38.5': 6" thick layer of hard material. 15 50 for 2"`-. **SCREEN** 1675 Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 24 - 44' bas 16 12-17-22-30. At 42-42.5': Silt layer. 9-18-24-50. At 43.5-44': Silt layer. End of boring 44.0 feet 45 Date Boring Started: 8/19/15 Remarks: DTW = 33.24' TOR on 8/20/2015 (elev. 1684.29) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-104 DRAFT

BARR MILITINE PROPERTY SERVICE PROPERTY SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum: NAD 83 Completion Depth:32.0 ft feet Sample Type & Recovery Graphic Log feet Š WELL OR PIEZOMETER Blows/6in USCS Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). LEAN CLAY WITH SAND (CL): fine to medium grained; Brown (5/4 7.5YR); moist; gravel; 4-5-5-5 medium plasticity; [Cannonball Formation]. 1680· PRO. CASING ameter 4" CL Type: Steel pipe 3-5-6-8 Interval: 3.5' ags - 1.5' bgs LEAN CLAY (CL): Brown (4/4 7.5YR); oxidized staining and mottling; medium to high plasticity; with gypsum throughout; [Cannonball Formation]. RISER CASING 5 3 3-7-9-10 Type: PVC SCH 80 3.06' ags - 9' Interval: 1675 bgs 5-7-9-10. **GROUT** Type: None Interval: None 5 5-9-9-10. **SEAL** 10₹ Type: Bentonite chips Interval: 0 - 7' bgs 5-7-9-10. CL 1670⁻ **SANDPACK** At 12': Heavily oxidized. Type: Silica 40-70 5-8-8-12. Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot 15 8 5-9-11-15. At 15': Start seeing black staining. Type: PVC SCH 80 Interval: 9 - 29' bas 1665 6-9-11-13. At 17': Heavily oxidized. SILTY SAND (SM): Strong Brown (5/6 7.5YR); wet; [Cannonball Formation]. 10 4-7-16-19 At 19.5': Color change to Brown (5/4 7.5YR). 20 SM 5-16-22-26 At 21': Oxidized layer. 1660· FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand layers below 27'; [Cannonball Formation]. 12 7-11-14-CH Date Boring Started: 8/20/15 Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26) Date Boring Completed: 8/20/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA



Drilling Contractor:

Drill Rig:

Terracon

Rig mounted HSA

LOG OF BORING MW-104

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1681.5 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location:Mandan, ND Sampling Method:SPT Coordinates:Lat: 438853.542° Long: 1869832.72° Datum: NAD 83 Completion Depth:32.0 ft Elevation, feet Sample Type & Recovery Graphic Log Sample No. Depth, feet U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** 6-12-16 17. FAT CLAY (CH): Dark Gray (4/1 7.5YR); moist; stiff; high plasticity; with interbedded sand layers below 27'; [Cannonball Formation]. (continued) 1655· PRO. CASING 14 8-12-16-21. Diameter: 4" CH Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 15 8-12-16-20. RISER CASING 30 Diameter: 2" Driller notes: sluff. Type: PVC SCH 80 16 Interval: 3.06' ags - 9' 1650bgs End of boring 32.0 feet **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 32' bgs **SCREEN** Diameter: 2"; No.6 slot M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT 40 Type: PVC SCH 80 Interval: 9 - 29' bgs 45 _50____ Date Boring Started: 8/20/15 Remarks: DTW = 13.25' TOR on 8/21/2015 (elev. 1671.26) Date Boring Completed: 8/20/15 Logged By: JEG3

Additional data may have been collected in the field which is not included on this log. Weather:



JECTS/34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-105

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 1 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum: NAD 83 Completion Depth:30.0 ft feet Sample Type & Recovery Graphic Log feet Š U S C S WELL OR PIEZOMETER Blows/6in Elevation, Sample ! Depth, LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** TOPSOIL: Brown (5/4 7.5YR). 1685⁻ 6-7-6-5 SANDY LEAN CLAY (CL): fine to medium grained; Brown (4/2 7.5YR); moist; gravel; PRO. CASING medium plasticity; [Cannonball Formation]. ameter: 4" Type: Steel pipe 5-5-5-6 Interval: 3.5' ags - 1.5' bgs CL RISER CASING 5 3 3-2-4-5 neter: 2" Type: PVC SCH 80 1680-3.16' ags - 10' Interval: bgs 4 2-2-2-3 **GROUT** Type: None LEAN CLAY (CL): Brown (4/2 7.5YR); soft; high plasticity; wet at 16'; [Cannonball Formation]. Interval: None 2-1-2-2. 10<u>⊣</u> **SEAL** Type: Bentonite chips At 10.5': Color change to Reddish-Yellow (6/6 7.5YR). Interval: 0 - 7' bgs 1675 2-1-2-1 **SANDPACK** Type: Silica 40-70 Interval: 7 - 30' bgs 2-1-1-3 **SCREEN** At 14.5-15.5': Gravel inclusions. Diameter: 2"; No.6 slot 15 CL 4-3-5-5 Type: PVC SCH 80 At 15.5': Color change to Brown (4/3 7.5YR). Interval: 10 - 30' bas 1670-7-9-11-13. At 18': Color change to Brown (5/3 7.5YR). 10 7-9-11-13 20 1665 11 7-9-13-15. POORLY GRADED SAND WITH SILT (SP-SM): medium to coarse grained; Brown (5/4 7.5YR); [Cannonball Formation]. 12 19-26-28-30. SP-SM Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 Drilling Contractor: Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

Barr Engineering Company 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

M:\GINT\PROJECTS\34300014.GPJ BARRLIBRARY.GLB ENVIRO LOG BARR TEMPLATE.GDT

LOG OF BORING MW-105 DRAFT

BARR Millineapons, Mil 50 .52 Telephone: 952-832-2600 SHEET 2 OF 2 Project:R.M. Haskett Station CCR Monitoring Network Surface Elevation: 1686.0 ft Project No.:34300014.12 Drilling Method: HSA Unique Well No.: Location: Mandan, ND Sampling Method:SPT Coordinates:Lat: 438042.079° Long: 1870325.657° Datum: NAD 83 Completion Depth:30.0 ft Elevation, feet Sample Type & Recovery Graphic Log Depth, feet Sample No. U S C S WELL OR PIEZOMETER Blows/6in LITHOLOGIC DESCRIPTION CONSTRUCTION **DETAIL** FAT CLAY (CL): Dark Brown (3/4 7.5YR); high plasticity; sand lens at 26.5'; [Cannonball 1660· At 26': Color change to Gray (5/1 7.5YR). PRO. CASING 14 10-15-18-30. Diameter: 4" CL Type: Steel pipe Interval: 3.5' ags - 1.5' bgs 11-16-22-32. RISER CASING 30 Diameter: 2" End of boring 30.0 feet Type: PVC SCH 80 Interval: 3.16' ags - 10' bgs **GROUT** Type: None Interval: None **SEAL** 35 Type: Bentonite chips Interval: 0 - 7' bgs SANDPACK Type: Silica 40-70 Interval: 7 - 30' bgs **SCREEN** Diameter: 2"; No.6 slot 40 Type: PVC SCH 80 Interval: 10 - 30' bgs 45 _50____ Date Boring Started: 8/17/15 Remarks: DTW = 13.22' TOR on 8/21/2015 (elev. 1675.92) Date Boring Completed: 8/17/15 Logged By: JEG3 **Drilling Contractor:** Terracon Additional data may have been collected in the field which is not included on this log. Weather: Drill Rig: Rig mounted HSA

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

1. WELL OWNER	7. WATER LEVEL
Name <u>Montana Dakota Utilities</u>	Static water level12.3feet below land surface If flowing: closed-in pressurepsi
AddressBismarck, ND	GPM flowthroughinch pipe
2. WELL LOCATION	Controlled by: [7] Valve [7] Reducers [7] Other
Sketch map location must agree with written location.	If other, specify
Heskett Ash Dispoal Site #1-90	8. WELL TEST DATA Pump
139-81-10CAD \(\frac{\xi}{2}\)	Pumping level below land surface:
Top nof pipe	ft. afterhrs. pumpinggpm
1675.54 Ground level	ft. afterhrs. pumpinggpm
Sec. [1 Mile] 1673 Morton	ft. afterhrs. pumpinggpm
SE 1/4 NE 1/4 SW 1/4 Sec. 10 Twp. 139 N. Rg. 81 W.	
3. PROPOSED USE Geothermal Monitoring	9. WELL LOG
☐ Domestic ☐ Irrigation ☐ Industrial	Formation Depth (ft.) From To
Stock Municipal Test Hole	Clay, fill 3
4. METHOD DRILLED	Sand, fine to medium, yellowish
Cable Reverse Rotary Bored	brown Clay, silty, yellowish brown,
X Forward Rotary Jetted Auger Auger If other, specify	bedrock 13
5. WATER QUALITY	Clay, silty, medium gray 13 15
Was a water sample collected for:	
Chemical Analysis?	
Bacteriological Analysis? Yes No If so, to what laboratory was it sent	
6. WELL CONSTRUCTION	
Diameter of hole $\frac{5}{1000}$ inches. Depth $\frac{15}{1000}$ feet.	
Casing: Steel X Plastic Concrete	
Threaded Welded Other	
If other, specify	
Pipe Weight: Diameter: From: To:	
SDR-21 books _2inches _+2.0feet _5feet	
lb/ftinchesfeetfeet	
lb/ftinchesfeetfeet	
Was perforated pipe used?	
Perforated pipe set fromft tofeet	(Use separate sheet if necessary.)
Was casing left open end?	
T37.77	10. DATE COMPLETED 2/5/90
Material <u>PVC</u> Diameter <u>2</u> inches (stainless steel, bronze, etc.)	11. WAS WELL PLUGGED OR ABANDONED?
Slot size 10 set from 5 feet to 15 feet	☐ Yes ② No
Slot sizeset fromfeet tofeet	If so, how
Was a packer or seal used? X Yes No	12. REMARKS:
If so, what material cse bentonibepth 3 to 4 Ft.	2" PVC cap on bottom of screen 160# of silica sand pack
Type of well: Straight screen Gravel packed	160# of Silica Sand pack
Depth grouted: From 3 To surface	
	13. DRILLER'S CERTIFICATION
If other explain: <u>w/bentonite</u>	This well was drilled under my jurisdiction and this report is
Well head completion: Pitless unit	true to the best of my knowledge.
12" above grade X Other	Water Supply, Inc. Drillor's or Firm's Name Cartificate No.
	Driller's or Firm's Name Box 1191 - Bismarck, ND 58502
If other, specify	Address
Was pump installed: Yes No	-120ul/Muller 2/5/90
Was well disinfected upon completion? Yes 🗵 No	Signed by Lewis Knutson Date

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

1. WELL OWNER	7. WATER LEVEL
Name <u>Montana Dakota Utilities</u>	Static water level <u>dry</u> feet below land surface
AddressBismarck, ND	If flowing: closed-in pressurepsi
2. WELL LOCATION	GPM flowthroughinch pipe Controlled by: Ualve Reducers Other
Sketch map location must agree with written location.	If other, specify
Heskett Ash NORTH	
Disposal Site	8. WELL TEST DATA
#2-90 139-81-10CAB1	Description Descri
Top of pipe	Pumping level below land surface:
1686.54	ft. afterhrs. pumpinggpm
Ground level	ft. afterhrs. pumpinggpm
County Morton	ft. afterhrs. pumpinggpm
SW 1/4NE 1/4 NW 1/4 Sec. 10 Twp. 139 N. Rg. 81 W.	9. WELL LOG
3. PROPOSED USE Geothermal Monitoring	
☐ Domestic ☐ Irrigation ☐ Industrial	Formation Depth (ft.) From To
Stock [] Municipal [] Test Hole	Topsoil, silty, black 0 1
4. METHOD DRILLED	Sand, fine, yellowish gray 1 6.5
Cable Reverse Rotary Bored	Clay, silty, yellowish brown, 6.5 11
[X Forward Rotary [] Jetted [] Auger	Clay, silty, medium gray 11 13
If other, specify	Sand 15.5
5. WATER QUALITY Was a water sample collected for:	Clay, silty, medium gray, bedrock 15.5 23
Chemical Analysis?	bedrock 15.5 23
Bacteriological Analysis?	
If so, to what laboratory was it sent	
6. WELL CONSTRUCTION	
Diameter of hole $\frac{5}{}$ inches. Depth $\frac{23}{}$ feet.	
Casing: Steel Plastic Concrete	
Threaded Welded Other	
If other, specify	
Pipe Weight: Diameter: From: To: SDR-21 PSOR. 2 inches +2.3 feet 13 feet	
lb/ftinchesfeetfeet	
lb/ftinchesfeetfeet	
Was perforated pipe used? Yes X No	
Perforated pipe set fromft tofeet	(Use separate sheet if necessary.)
Was casing left open end?	
	10. DATE COMPLETED 2/5/90
Material PVC Diameter 2 inches (stainless steel, bronze, etc.)	11. WAS WELL PLUGGED OR ABANDONED?
Slot size 10 set from 13 feet to 23 feet	☐ Yes ☑ No
Slot sizeset fromfeet tofeet	If so, how
Was a packer or seal used? XYes . No	12. REMARKS:
If so, what materiacs <u>e bentonit</u> epth <u>11 to 12 Ft.</u>	2" PVC cap on bottom of screen
Type of well: Straight screen 🔲 Gravel packed 🔯	TOOH OTTTO PACIT
Depth grouted: From 11To_surface	
	13. DRILLER'S CERTIFICATION
If other explain: W/bentonite	This well was drilled under my jurisdiction and this report is
	true to the best of my knowledge.
Well head completion: Pitless unit	Water Supply, Inc. 46
12" above gradeXOther	Driller's or Firm's Name Certificate No. Box 1191 - Bismarck, ND 58502
If other, specify	Address
Was pump installed: Yes 🖾 No	2/5/90 2/5/90
Was well disinfected upon completion? Yes 🗓 No	Signed by Lewis Knutson Date
VHITE-DRILLER'S CORY YELLOW-BOARD'S CORY PINK-CLI	STONER'S CORY

STATE OF NORTH DAKOTA

BOARD OF WATER WELL CONTRACTORS

900 E. BOULEVARD . BISMARCK, NORTH DAKOTA 58501

WELL DRILLER'S REPORT

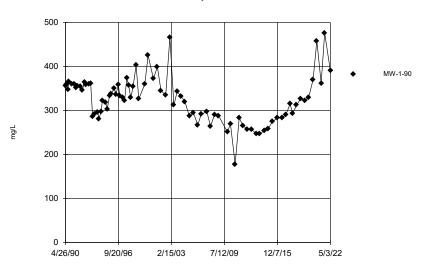
State law requires that this report be filed with the State Board of Water Well Contractors within 30 days after completion or abandonment of the well.

11. WELLOWNER	7. WATER LEVEL	
Name <u>Montana Dakota Utilities</u>	Static water level dry	
AddressBismarck, ND	If flowing: closed-in pressure	
2. WELL LOCATION	Controlled by: [] Valve []	Reducers
Sketch map location must agree with written location.	If other, specify	
Heskett Ash Disposal Site		
#3-90	8. WELL TEST DATA	
139-81-10CAB2	Pump Bailer Oth	er Andrew Andrew Andrew Andrew Andrew
Top of pipe ——————————————————————————————————	Pumping level below land surface:	
Ground level		pumpinggpm
1683.6 Sec. [1 Mile] County Morton		pumpinggpm
CountyMorton	ft. afterhrs.	pumpinggpm
	9. WELL LOG	
3. PROPOSED USE Geothermal Monitoring		Depth (ft.)
□ Domestic □ Irrigation □ Industrial □ Stock □ Municipal □ Test Hole	Formation	From To
	Topsoil, silty, black Clay, silty, yellowish brown,	
4. METHOD DRILLED Reverse Rotary Bored	till till	
Forward Rotary [] Jetted Auger	Sand, fine, yellowish brown	7
If other, specify	Clay, silty, medium gray, til. Clay, silty to sandy, medium	
5. WATER QUALITY	gray, abt 40% sand	15 20
Was a water sample collected for:		
Chemical Analysis?		
If so, to what laboratory was it sent		
6. WELL CONSTRUCTION		
Diameter of hole5inches. Depth20feet.		
Casing: Steel X Plastic Concrete		
☐ Threaded ☐ Welded ☐ Other		
If other, specify		
Pipe Weight: Diameter: From: To:		
SDR-21 XXXXXX. 2 inches $\frac{+2.3}{}$ feet $\frac{10}{}$ feet		
lb/ftinchesfeetfeet		
lb/ftinchesfeetfeet		
Was perforated pipe used?		
Perforated pipe set fromft tofeet	(Use separate sheet if n	ecessary.)
Was casing left open end?		
Was a well screened installed? X Yes \(\subseteq \text{No} \)	10. DATE COMPLETED	2/5/90
Material <u>PVC</u> <u>Diameter 2</u> inches (stainless steel, bronze, etc.)	11. WAS WELL PLUGGED OR ABAND	ONED?
Slot size 10 set from 10 feet to 20 feet		No
Slot sizeset fromfeet tofeet	If so, how	
	12. REMARKS:	
aro bonton 7 5 to 0	2" PVC cap on bottom of screen	
	160# silica sand pack	
Type of well: Straight screen Gravel packed 🖾		
Depth grouted: From 7.5 To surface		
Grouting Material: Cement X_Other	13. DRILLER'S CERTIFICATION	
If other explain: <u>W/bentonite</u>	This well was drilled under my juristrue to the best of my knowledge.	sulction and this report is
Well head completion: Pitless unit	Water_Supply,_Inc	46
12" above gradeXOther	Driller's or Firm's Name	Certificate No.
If other, specify	Box 1191 - Bismarck, ND 58	502
Was pump installed:	Address	
Was well disinfected upon completion? Yes 🔼 No	Signed-by Lewis Knutson	2/5/90 Date

Appendix F

MW1-90 Time Series Plots

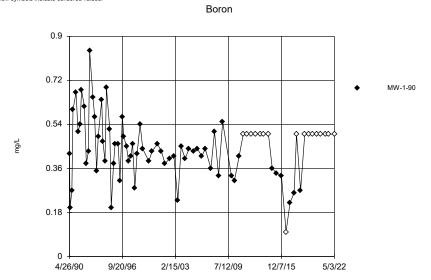
Alkalinity, bicarbonate



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

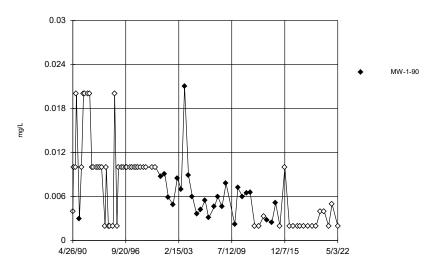
${\it Sanitas}^{\rm tw}\,v.9.6.36\,{\it For the statistical analyses of ground water by Barr Engineering Company only.\,UG\,Hollow symbols indicate censored values.}$



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

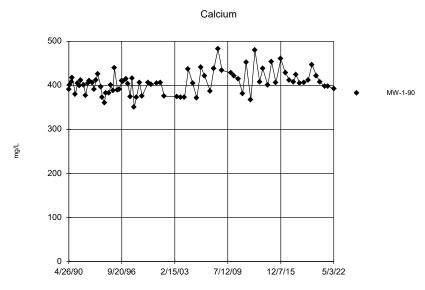
Arsenic



Time Series Analysis Run 12/14/2022 1:52 PM

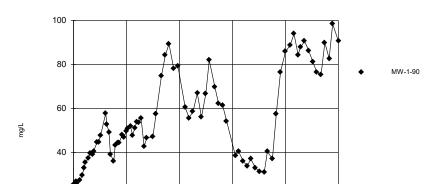
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190



Chloride

Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

7/12/09

12/7/15

5/3/22

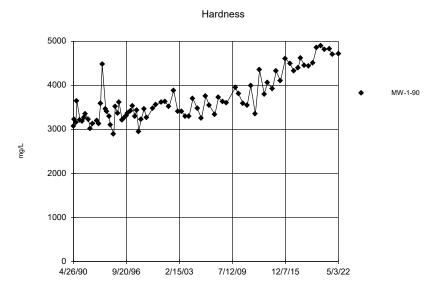
2/15/03

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

9/20/96

20

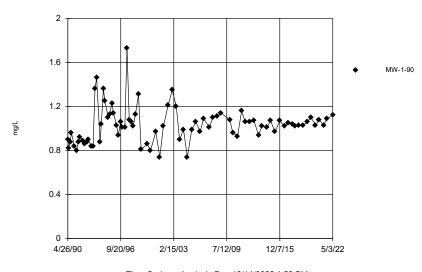
4/26/90



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

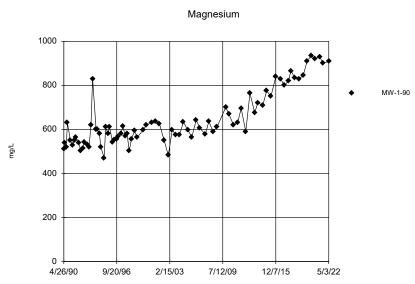
Fluoride



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

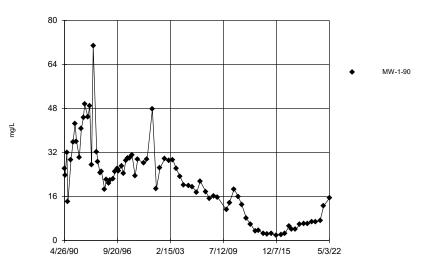
Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

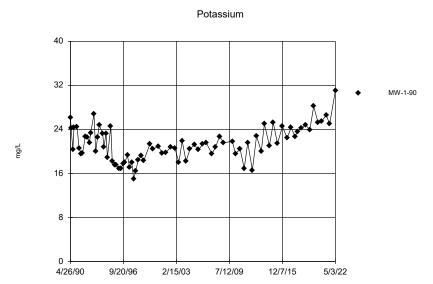




Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

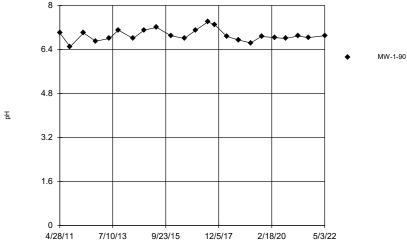
Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190



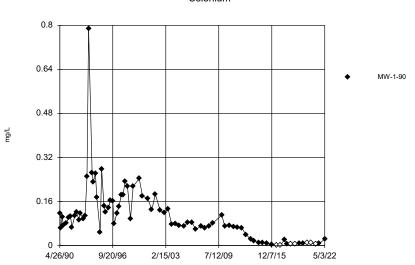


Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

 $Sanitas^{\text{tw}}\,v.9.6.36\,For\,the\,statistical\,analyses\,of\,ground\,water\,by\,Barr\,Engineering\,Company\,only.\,UG\,Hollow\,symbols\,indicate\,censored\,values.$

Selenium



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

2000 1600 1200 800

Sodium

Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

7/12/09

12/7/15

5/3/22

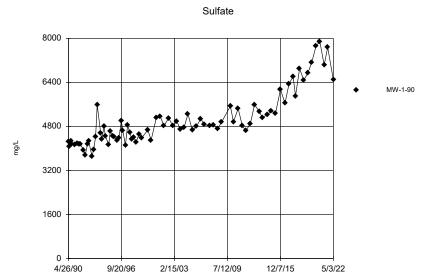
2/15/03

$Sanitas^{\text{\tiny{IM}}} \text{ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG}$

9/20/96

400

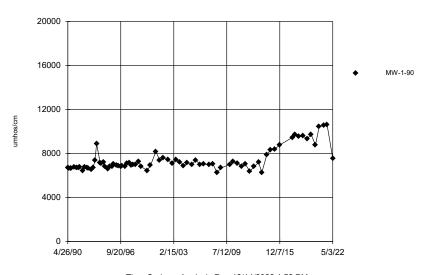
4/26/90



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett_AMR_MW190

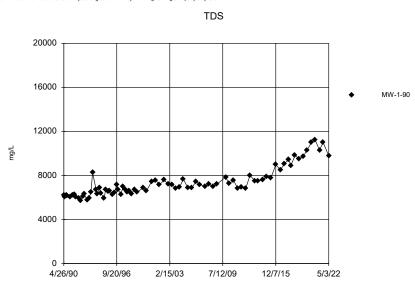
Specific conductance



Time Series Analysis Run 12/14/2022 1:52 PM

R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Sanitas™ v.9.6.36 For the statistical analyses of ground water by Barr Engineering Company only. UG

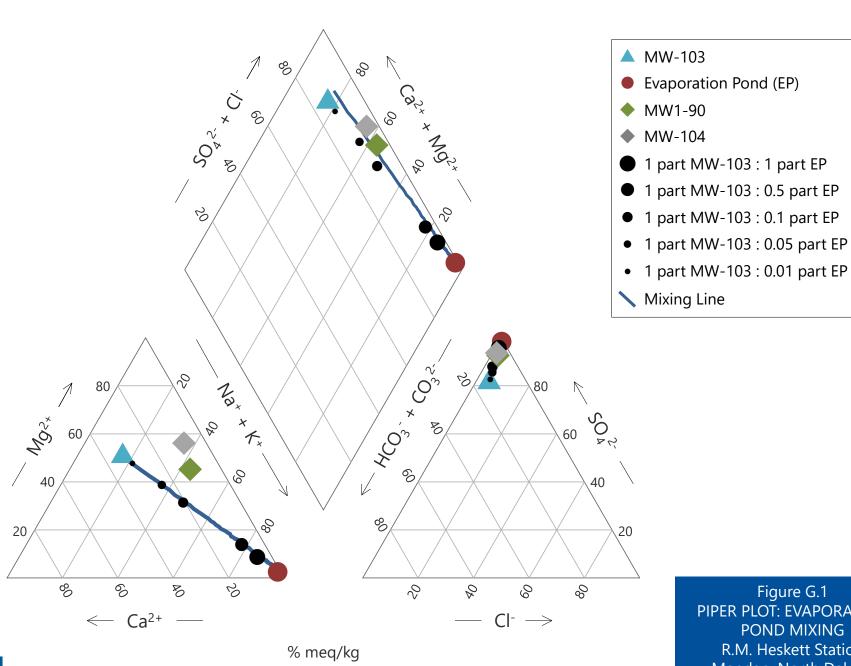


Time Series Analysis Run 12/14/2022 1:52 PM

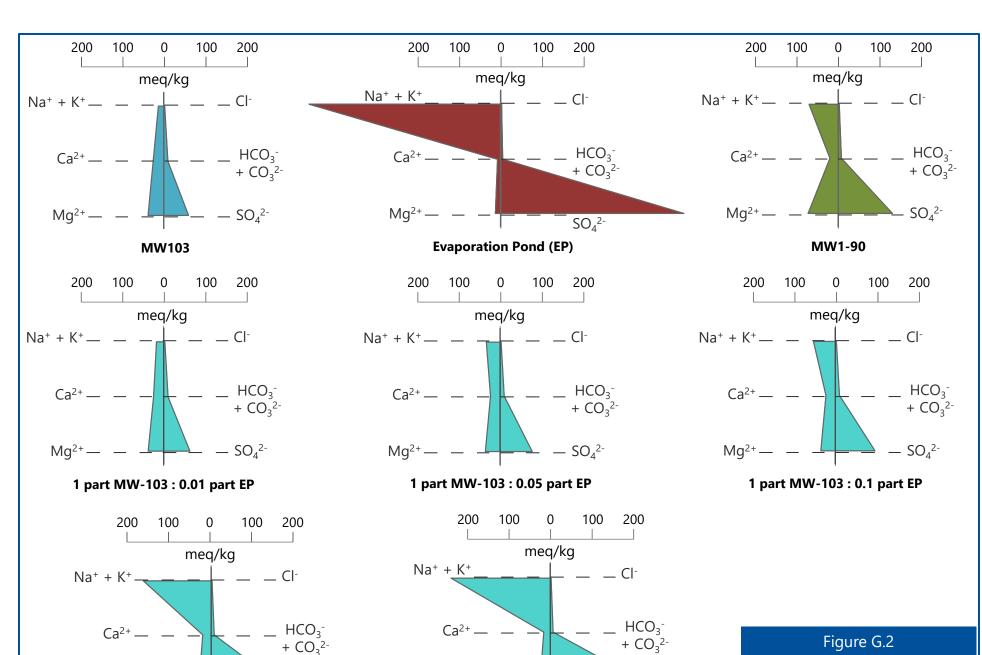
R.M. Heskett Station Client: Montana-Dakota Utilities Co. Data: MDUHeskett AMR MW190

Appendix G

Geochemist's Workbench Results



PIPER PLOT: EVAPORATION **POND MIXING** R.M. Heskett Station Mandan, North Dakota



STIFF PLOT: EVAPORATION
POND MIXING
R.M. Heskett Station
Mandan, North Dakota



1 part MW-103 : 0.5 part EP

1 part MW-103 : 1 part EP

Table G.1
Geochemist's Workbench Mixing Model Results

Descr	ription	Upgradient	Evap Pond		Mixing Evap Pond into MW 103				Downg	radient
Samı	ple ID	MW-103	Evap Pond	1:0.01	1:0.01 1:0.05 1:0.1 1:0.5 1:1					MW 104
Sampl	le Date	8/23/2021	9/16/2014			n/a			5/3/2022	8/24/2021
HCO3	mg/l	645	340	642	630	617	543	492	476	820
Ca++	mg/l	500	125	496	482	466	375	313	392	422
CI	mg/l	119	79.8	119	117	115	106	99	90.7	94.1
F	mg/l	0.30	0.1	0.30	0.29	0.28	0.23	0.20	1.12	0.54
Mg++	mg/l	464	165	461	450	437	364	315	909	1,640
K+	mg/l	20.0	734	27.1	54.0	84.9	258	377	31.0	34
Na+	mg/l	266	10,600	368	758	1,210	3,710	5,430	1,620	1,940
SO4	mg/l	3,000	22,100	3,190	3,910	4,740	9,370	12,500	6,490	11,600
рН	SU	6.6	10.7	6.6	6.7	6.7	7.4	8.9	6.9	6.9
TDS	mg/kg	4,950	34,100	5,240	6,350	7,610	14,700	19,600	9,980	16,500

Appendix C

Groundwater Elevation and Flow Rate

Appendix C Groundwater Levels 2022 Annual Monitoring Report

Heskett CCR Groundwater Compliance

		Top of Riser Elevation	Depth to Water	Water Level Elevation
Location	Date	ft amsl	ft	ft amsl
MW101	5/2/2022	1719.53	37.94	1681.59
MW102	5/2/2022	1706.64	19.50	1687.14
MW103	5/2/2022	1717.53	36.74	1680.79
MW104	5/2/2022	1684.51	14.18	1670.33
MW105	5/2/2022	1689.14	11.78	1677.36
MW13	5/2/2022	1724.27	31.25	1693.02
MW33	5/2/2022	1717.95	42.76	1675.19
MW44R	5/2/2022	1711.57	27.14	1684.43
MW70	5/2/2022	1706.34	21.78	1684.56
MW80R	5/2/2022	1686.78	12.96	1673.82
MW1-90	5/3/2022	1675.86	9.99	1665.87
MW2-90	5/3/2022	1687.08	21.28	1665.80
MW3-90	5/3/2022	1686.46	18.31	1668.15
MW2-90	8/8/2022	1687.08	22.25	1664.83
MW3-90	8/8/2022	1686.46	19.75	1666.71
MW80R	8/8/2022	1686.78	14.85	1671.93
MW1-90	8/11/2022	1675.86	14.15	1661.71
MW101	10/17/2022	1719.53	38.50	1681.03
MW102	10/17/2022	1706.64	19.28	1687.36
MW103	10/17/2022	1717.53	35.68	1681.85
MW104	10/17/2022	1684.51	15.54	1668.97
MW105	10/17/2022	1689.14	13.53	1675.61
MW13	10/17/2022	1724.27	30.63	1693.64
MW33	10/17/2022	1717.95	44.10	1673.85
MW44R	10/17/2022	1711.57	28.91	1682.66
MW70	10/17/2022	1706.34	22.50	1683.84
MW80R	10/17/2022	1686.78	15.40	1671.38
MW1-90	10/18/2022	1675.86	>14.48	<1661.38
MW2-90	10/18/2022	1687.08	>22.40	<1664.68
MW3-90	10/18/2022	1686.46	>20.22	<1666.24

Appendix C **Groundwater Flow Rate** 2022 Annual Monitoring Report **Heskett CCR Groundwater Compliance**

Heskett Groundwater Velocity Calculation

Sampling Date	5/2/2022-5/3/2022
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Upgradient: MW13

Top of Casing Elevation	1724.27 ft amsl	
Depth to Water	31.25 ft below T	ОС
Water Level Elevation	1693.02 ft amsl	

Groundwater Monitoring System Report (Barr, 2016)

Downgradient: MW1-90

Top of Casing Elevation	1675.86	ft amsl
Depth to Water	9.99	ft below TOC
Water Level Elevation	1665.87	ft amsl

Groundwater Monitoring System Report (Barr, 2016)

horizontal hydraulic	1.00E-04	cm/s
conductivity (Kh)	2.83E-01	ft/day
porosity (n)	0.25	
horizontal distance	1850	ft
WL elevation difference	27.15	ft
gradient (i)	0.015	ft/ft
linear velocity (V)	0.0166401	ft/day
V	6.1	ft/yr

Groundwater Monitoring System Documentation (Barr, 2017)

Groundwater Monitoring System Documentation (Barr, 2017)

Appendix C Groundwater Flow Rate 2022 Annual Monitoring Report **Heskett CCR Groundwater Compliance**

Heskett Groundwater Velocity Calculation

Sampling Date	10/17/2022-10/18-2022
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Upgradient: MW13

Top of Casing Elevation	1724.27 ft amsl
Depth to Water	30.63 ft below TOC
Water Level Elevation	1693.64 ft amsl

Groundwater Monitoring System Report (Barr, 2016)

Downgradient: MW104

Top of Casing Elevation	1684.51	ft amsl
Depth to Water	15.54	ft below TOC
Water Level Elevation	1668.97	ft amsl

Groundwater Monitoring System Report (Barr, 2016)

horizontal hydraulic	1.00E-04	cm/s
conductivity (Kh)	2.83E-01	ft/day
porosity (n)	0.25	
horizontal distance	1640	ft
WL elevation difference	24.67	ft
gradient (i)	0.015	ft/ft
linear velocity (V)	0.0170563	ft/day
V	6.2	ft/yr

Groundwater Monitoring System Documentation (Barr, 2017)

Groundwater Monitoring System Documentation (Barr, 2017)