2024 Annual Groundwater Monitoring and Corrective Action Report

AVS CCR Landfill

Antelope Valley Station
Beulah, North Dakota

Prepared for
Basin Electric Power Cooperative

Prepared by
Barr Engineering Co.

January 2025

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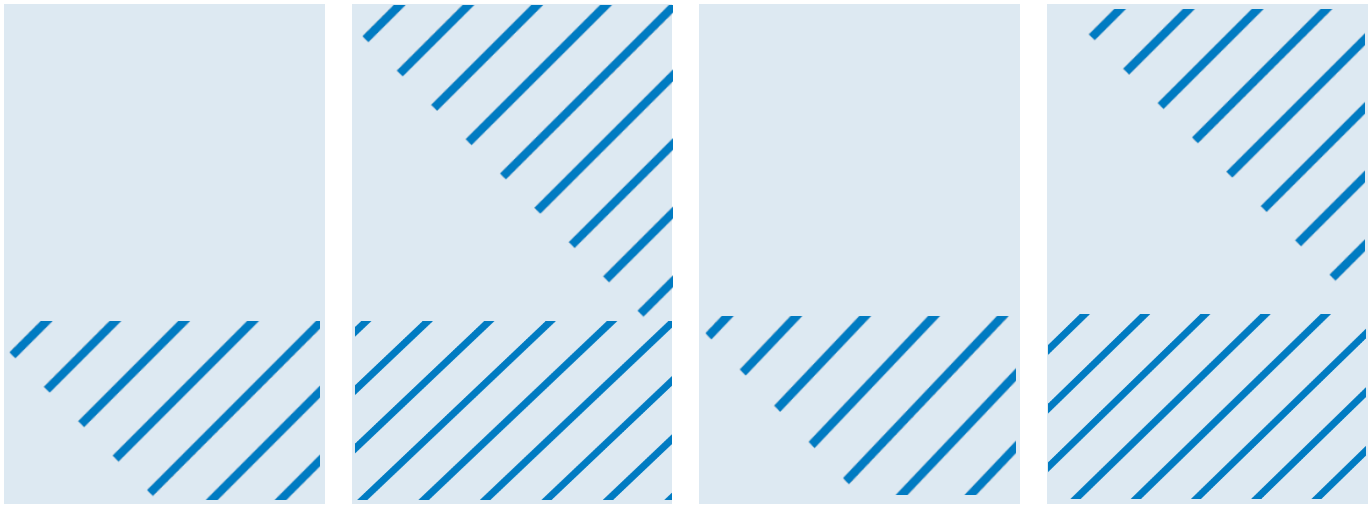

2024 Annual Groundwater Monitoring and Corrective Action Report

January 2025

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Abbreviations

asml	above mean sea level
ASD	Alternative Source Demonstration
AVS	Antelope Valley Station
bgs	below ground surface
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
cm	centimeters
EPA	Environmental Protection Agency
FGD	flue gas desulfurization
ft	feet
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
SAP	Sampling and Analysis Plan
sec	second
SSI	Statistically Significant Increase
TDS	Total Dissolved Solids

Executive Summary

This 2024 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the Coal Combustion Residuals (CCR) landfill at Basin Electric Power Cooperative's (Basin Electric) Antelope Valley Station (Site). The permitted landfill is the only CCR Unit at this Site. Content of this report is to satisfy requirements of the federal CCR rule.

In 2018 the CCR Unit began operating under a detection monitoring program as described in 40 CFR § 257.94 and NDAC 33.1-20-08-06-04. At the beginning, end, and throughout 2024, the CCR Unit was operating under a detection monitoring program with semi-annual detection monitoring events conducted in the early summer and fall. Landfill expansion required the installation of three additional monitoring wells in September 2020: background well MW-21(S) and downgradient wells MW-22(S) and MW-24(S). In late 2023, three new downgradient landfill expansion wells, MW-25(S), MW-26(S), and MW-27(S), were installed at the Site. In May 2023, CCR waste began being placed into the landfill expansion area. Chloride in monitoring well MW-24(S) was verified as an SSI at the end of the 2023 reporting year, and a successful ASD was completed in 2024. During this report timeframe, and pursuant to § 257.94 and NDAC 33.1-20-08-06-04, statistically significant increases (SSIs) were determined for:

- June 2024: chloride at MW-16(S), MW-20(S), MW-24(S), MW-25(S), and MW-26(S) and boron, calcium, chloride, and total dissolved solids (TDS) at MW-27(S)
- October 2024: chloride at MW-16(S), MW-20(S), MW-24(S), MW-25(S), and MW-26(S) and boron, calcium, and chloride at MW-27(S)

Subsequent determinations and actions (if any) will be addressed in the 2025 Annual Report. Successful alternative source demonstrations (ASDs) were completed for the SSIs determined during the October 2023 and June 2024 sampling events. The ASD documentation for SSIs determined for both the fall 2023 and spring 2024 monitoring events are included in this report under Appendix B. An ASD for the October 2024 detection monitoring results is in progress, and results of the ASD are anticipated in 2025. 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 Introduction

Basin Electric Power Cooperative (Basin Electric) owns and operates Antelope Valley Station (AVS), comprised of a coal-fired generating station consisting of two power generating units, located in Beulah, North Dakota (Figure 1). Unit 1 coal-based operations began in 1984 and Unit 2 operations began in 1986. One coal combustion residual (CCR) 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 landfill (Site or CCR Landfill) was permitted by the North Dakota Department of Environmental Quality (NDDEQ) in 1995 under Permit SP-160 (now designated 0160) and began accepting CCR in 1996. The most recent Permit 0160 was issued by NDDEQ in early 2022, and the most recent cell including a composite liner system and leachate collection system was constructed the same year.

The CCRs including fly ash, bottom ash, and flue gas desulfurization (FGD) waste are managed at the Site along with other minor wastes accepted as per the NDDEQ permit. 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 NDDEQ CCR Rule (NDAC Title 33.1, Article 20, Chapter 8).

This 2024 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) describes the monitoring program and results for the CCR landfill. No corrective actions were required or conducted in 2024.

Basin Electric utilizes a consulting firm, Barr Engineering Co. (Barr) to assist in groundwater reporting and analysis. Barr is familiar with the Site and installed and certified the most recent added to the network wells (MW-25(S), MW-26(S), and MW-27(S)). Barr has reviewed the historical groundwater data, CCR information for the Site, and is knowledgeable about facility design and operation.

Additional Site monitoring information, including CCR reports and certifications can be found on Basin Electric's CCR website: Section 7 CCR Landfill - AVS - Basin Electric Power Cooperative.

1.1 Physical Setting

The geology underlying the Site includes mine spoils underlain by the Sentinel Butte Formation. This formation is comprised of continental deposits more than 1,000-feet thick, consisting of dense clay, weakly cemented sandstone, mudstone, and lignite beds.

The base of the CCR Landfill is underlain by 115 to 200 feet (approximately) of clay-rich mine spoil that overlies the Lower Sentinel Butte Formation. At the Site, the Sentinel Butte is comprised primarily of dense clay with a trace of very fine sand and lignite beds typically ranging from 6- to 9-feet thick.

The uppermost aquifer is found within the 6- to 9-foot unmined lignite bed, mapped locally as the Spaer Bed or Spaer Lignite, located at depths ranging roughly from 180 to 260 feet below ground surface (ft bgs). The elevation of the Spaer Lignite varies across the Site by approximately 35 feet from 1,844 feet above mean sea level (ft amsl) at MW-18(S) to 1,879 ft amsl at MW-23(S). The potentiometric surface reflects that variation.

Across the southern portions of the landfill, the potentiometric surface generally slopes to the east with groundwater elevations ranging from approximately 1,893 ft amsl on the western side of the CCR Landfill to 1,886 ft amsl on the eastern side. In the northern portion of the landfill, the potentiometric surface

generally slopes to the northeast with groundwater elevations ranging from 1,893 ft amsl in the southwestern corner to 1,864 ft amsl in the northeastern corner. Field hydraulic conductivity measurements from 2017 for the uppermost aquifer range from 1.65 x 10^{-4} centimeters per second (cm/sec) in MW-19(S) to 2.48 x 10^{-9} cm/sec in Well MW-16(S).

Additional Site information can be found on Basin Electric's CCR website in the CCR Groundwater Monitoring System Report (AECOM, 2017).

1.2 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.

1.3 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)	§ 33.1-20-08-06-01(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 3, Table 4, Table 5, 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)	n/a	**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 Groundwater Monitoring Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR unit in 2024. 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 2025 are described in Section 2.4.

2.1 Groundwater Monitoring System

The certified groundwater monitoring well network around the CCR unit consists of three background wells and nine downgradient wells, sampled for groundwater analysis on a semi-annual basis as described in Table 2 below:

Table 2 Groundwater Monitoring System

CCR Unit	Background Wells	Downgradient Wells
Active Landfill	MW-18(S), MW-19(S)	MW-15(S), MW-16(S), MW-17(S), MW-20(S)
Landfill Expansion Area	MW-21(S)	MW-22(S), MW-24(S), MW-25(S), MW-26(S), MW-27(S)

The wells monitor the uppermost aquifer underlying the CCR unit in the lignite bed mapped locally as the Spaer Bed or the Spaer Lignite, within the Sentinel Butte Formation approximately 180 to 260 ft bgs. Well locations are shown on Figure 2. Monitoring wells MW-21(S), MW-22(S), MW-23(S), and MW-24(S) were installed in September 2020 in advance of northward landfill expansion to be used as background and downgradient monitoring wells. Wells MW-25(S), MW-26(S), and MW-27(S) were installed in late-2023 to provide enhanced downgradient coverage for the future expansion area. Background wells monitor background water quality that is not potentially influenced by the presence of the CCR unit.

Two monitoring wells, MW-14(S) and MW-23(S) have been historically excluded from the groundwater monitoring network due to insufficient water production. The wells remain in place for optional collection of groundwater level measurements for potential inclusion in the potentiometric evaluation of the Site.

Baseline monitoring was initiated in August 2016 for wells in the pre-expansion portion of the monitoring network and included sampling groundwater over ten baseline monitoring events. Baseline monitoring for wells MW-21(S), MW-22(S), MW-23(S), and MW-24(S) began in the spring of 2021 and continued through 2022. These wells were added to the well network in May 2023. The results of baseline monitoring are discussed in previous Annual Reports.

Detection monitoring events in 2024 and prior to 2024 were performed in general accordance with procedures established in the site-specific Sampling and Analysis Plan (SAP) (AECOM, 2018), which is included in the facility's Operating Record. The CCR Landfill was placed in Detection monitoring in October 2017, with the first Detection monitoring groundwater sampling event completed in April 2018. Detection monitoring events have been completed semi-annually since April 2018. The results of previous

Detection monitoring events were presented and discussed in the previous Annual Reports, which can be found on Basin Electric's CCR website.

2.1.1 Changes to Groundwater Monitoring System

Monitoring locations MW-25(S), MW-26(S), and MW-27(S) were added to the monitoring network in late 2023 in anticipation of waste placement in the landfill expansion area. Baseline monitoring and inclusion in detection monitoring began in June 2024 and will continue until at least eight samples have been collected. Baseline sampling results are included in Appendix D. The system described in Section 2.1 and shown on Figure 2 are described in the Groundwater Monitoring System Certification (Barr, 2024).

2.2 Actions Completed/Problems Encountered

The following actions were completed in 2024:

- **Background Update:** Background was statistically evaluated and updated to include data through 2023 from upgradient wells MW-18(S), MW-19(S), and MW-21(S) in accordance with the Groundwater Statistical Method Selection Certification (AECOM, 2017). The updated prediction limits were used for the spring and fall 2024 detection monitoring events.

- **Baseline Sampling:** Baseline Groundwater samples were collected at MW-25(S), MW-26(S), and MW-27(S) in June and October 2024 (Appendix D).

- **Detection Monitoring Sampling:** Groundwater samples were collected from each well in the groundwater monitoring system on June 11-13 and 17, 2024 and October 1-2 and 8, 2024. 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) (Table 3).

- **SSI Evaluation:** SSI evaluations were conducted in accordance with the Groundwater Statistical Method Selection Certification (AECOM, 2017) for the June 2024 and October 2024 detection monitoring events. Both detection monitoring events resulted in verified SSIs (Table 4).

- **Alternative Source Demonstration (ASD):** ASDs were conducted on the verified SSIs for the October 2023 and June 2024 detection monitoring events. The October 2023 SSIs were identified in the 2023 Annual Report (AECOM, 2024). 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)). An ASD for the October 2024 detection monitoring event is in progress and will be completed within 90 days of the SSI determination. More details are provided in Section 2.3. Subsequent determinations and actions (if any) will be addressed in the 2025 Annual Report.

Problems encountered in 2024:

- The water levels and field turbidity for samples collected at MW-27(S) suggest the well was screened in a low yielding interval of the uppermost aquifer. Groundwater may not fully recharge for the Site's semi-annual sampling frequency.

2.3 Data and Collection Summary

2.3.1 June 2024 Detection Monitoring Event

Groundwater samples were collected from the twelve groundwater monitoring network wells at the Site on June 11-13 and 17, 2024. Nine SSIs (chloride at MW-16(S), MW-20(S), MW-24(S), MW-25(S), MW-26(S) and boron, calcium, chloride, and total dissolved solids (TDS) at MW-27(S)) were identified. No verification resampling was performed. A summary of results is included in Table 5. 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.

An 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" and/or statistical methods and/or sampling methods 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: June 2024 Event Report is included in Appendix B.

2.3.2 October 2024 Detection Monitoring Event

Groundwater samples were collected from the twelve groundwater monitoring network wells at the Site on October 1-2 and 8, 2024. Eight SSIs (chloride at MW-16(S), MW-20(S), MW-24(S), MW-25(S), MW-26(S) and boron, calcium, and chloride at MW-27(S)) were identified. No verification resampling was performed. A summary of results is included in Table 5. Field data sheets and analytical laboratory reports for detection monitoring sampling are included in Appendix A. Water level contours are shown on Figure 4, and flow calculations are included in Appendix C.

An ASD was ongoing at the end of 2024. If the ASD is not successful, appropriate actions will be initiated per the CCR Rule as applicable.

2.4 Activities for Upcoming Year

The following key activities for analytical results and statistical evaluations are planned for 2025:

- Complete the ASD or assessment monitoring determination for the October 2024 detection monitoring event in accordance with the Statistical Certification (AECOM, 2017).
- Evaluate analytical results from 2025 semi-annual detection monitoring events for SSIs according to the Statistical Certification (AECOM, 2017).
- Continue baseline sample collection at MW-25(S), MW-26(S), and MW-27(S) until eight baseline samples have been collected.
- Evaluate sampling frequency and recharge rates at MW-27(S).
- Review the conceptual site model and consider recommendations for improvements to the monitoring well network if needed.

3 References

AECOM, 2017. CCR Groundwater Monitoring System Report, Antelope Valley Station. Prepared for Basin Electric Power Cooperative. October 2017.

AECOM, 2018. Sampling and Analysis Plan, CCR Monitoring Program, Antelope Valley Station. Prepared for Basin Electric Power Cooperative. January 2018.

AECOM, 2024. 2023 Annual Groundwater Monitoring and Corrective Action Report: AVS CCR Landfill. Prepared for Basin Electric Power Cooperative. January 2024.

Barr Engineering Co. (Barr), 2024. Groundwater Monitoring System Certification, Antelope Valley Station Landfill. Prepared for Basin Electric Power Cooperative. June 2024.

Tables

Table 3 Sampling Summary

Table 3
Sampling Summary
2024 Annual Monitoring Report
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Event Classification and Number	Monitoring Well	Up or Down Gradient	Event date	No. Samples
Detection Monitoring Event #1	MW-15S	Down	6/11/2024	1
Detection Monitoring Event #1	MW-16S	Down	6/12/2024	1
Detection Monitoring Event #1	MW-17S	Down	6/12/2024	1
Detection Monitoring Event #1	MW-18S	Up	6/12/2024	1
Detection Monitoring Event #1	MW-19S	Up	6/12/2024	2
Detection Monitoring Event #1	MW-20S	Down	6/11/2024	1
Detection Monitoring Event #1	MW-21S	Up	6/13/2024	1
Detection Monitoring Event #1	MW-22S	Down	6/13/2024	1
Detection Monitoring Event #1	MW-24S	Down	6/13/2024	2
Detection Monitoring Event #1	MW-25S	Down	6/17/2024	1
Detection Monitoring Event #1	MW-26S	Down	6/13/2024	1
Detection Monitoring Event #1	MW-27S	Down	6/17/2024	1
Detection Monitoring Event #2	MW-15S	Down	10/1/2024	1
Detection Monitoring Event #2	MW-16S	Down	10/2/2024	1
Detection Monitoring Event #2	MW-17S	Down	10/2/2024	1
Detection Monitoring Event #2	MW-18S	Up	10/8/2024	1
Detection Monitoring Event #2	MW-19S	Up	10/8/2024	2
Detection Monitoring Event #2	MW-20S	Down	10/1/2024	1
Detection Monitoring Event #2	MW-21S	Up	10/8/2024	1
Detection Monitoring Event #2	MW-22S	Down	10/2/2024	2
Detection Monitoring Event #2	MW-24S	Down	10/2/2024	1
Detection Monitoring Event #2	MW-25S	Down	10/2/2024	1
Detection Monitoring Event #2	MW-26S	Down	10/2/2024	1
Detection Monitoring Event #2	MW-27S	Down	10/2/2024	1

Table 4 Statistical Evaluation Summary

Table 4
Statistical Evaluation Summary
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

Spring 2024

	Appendix III Constituents						
Well	**Boron (T)**	**Calcium (T)**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**TDS**
MW-15(S)							
MW-16(S)							
MW-17(S)							
MW-20(S)							
MW-22(S)							
MW-24(S)							
MW-25(S)							
MW-26(S)							
MW-27(S)							

Fall 2024

	Appendix III Constituents						
Well	**Boron (T)**	**Calcium (T)**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**TDS**
MW-15(S)							
MW-16(S)							
MW-17(S)							
MW-20(S)							
MW-22(S)							
MW-24(S)							
MW-25(S)							
MW-26(S)							
MW-27(S)							

Sample had a value higher than the prediction limit determined from background data and is a verified SSI

Sample did not have a value higher than the prediction limit determined from background data

pH: two-sided prediction limit; color indicates sample higher and/or lower than prediction limits

No data at MW-14(S) and MW-23(S) as they have been historically dry

Table 5 Water Quality Analytical Data Summary

Table 5
Water Quality Analytical Data Summary
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

		Location	MW-15S	MW-15S	MW-16S	MW-16S	MW-17S	MW-17S	MW-18S	MW-18S	MW-19S		MW-19S		MW-20S	MW-20S	MW-21S	MW-21S
		Date	6/11/2024	10/01/2024	6/12/2024	10/02/2024	6/12/2024	10/02/2024	6/12/2024	10/08/2024	6/12/2024		10/08/2024		6/11/2024	10/01/2024	6/13/2024	10/08/2024
		Sample Type	N	N	N	N	N	N	N	N	N	FD	N	FD	N	N	N	N
Parameter	Analysis Location	Units																
Appendix III																		
Boron, total	Lab	mg/l	**0.12**	**0.12**	**0.14**	**0.14**	**0.12**	**0.13**	< 0.1 U	**0.10**	**0.12**	**0.12**	**0.14**	**0.14**	**0.12**	**0.13**	**0.11**	**0.13**
Calcium, total	Lab	mg/l	**3.96**	**3.80**	**1.72**	**2.22**	**3.90**	**3.76**	**4.70**	**7.14**	**4.18**	**4.16**	**4.39**	**4.35**	**4.80**	**4.49**	**4.84**	**4.78**
Chloride	Lab	mg/l	**13.2**	**14.1**	**32.7**	**26.0**	**12.7**	**13.6**	**8.0**	**8.9**	**19.1**	**19.3**	**19.4**	**19.6**	**25.9**	**25.8**	**19.2**	**19.2**
Fluoride	Lab	mg/l	**1.36**	**1.30**	**2.31**	**2.16**	**1.48**	**1.53**	**1.23**	**1.23**	**0.67**	**0.74**	**0.67**	**0.64**	**1.17**	**1.12**	**1.49**	**1.51**
pH	Field	pH units	**8.04**	**8.07**	**9.0**	**8.2**	**7.91**	**7.97**	**9.37**	**9.31**	**8.06**	--	**8.03**	--	**8.27**	**8.04**	**7.98**	**7.91**
Solids, total dissolved	Lab	mg/l	**1880**	**1870**	**936**	**1150**	**1700**	**1720**	**1770**	**1770**	**2170**	**2150**	**2180**	**2100**	**1780**	**1720**	**2100**	**1980**
Sulfate, as SO4	Lab	mg/l	**407**	**412**	**67.8**	**131**	**295**	**284**	**564**	**536**	**811**	**777**	**763**	**762**	**69.9**	**69.6**	**491**	**458**

-- Not analyzed/Not available.

N Sample Type: Normal

FD: Sample Type: Field Duplicate

U: The analyte was analyzed for, but was not detected.

Table 5
Water Quality Analytical Data Summary
2024 Annual Monitoring Report
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		Location	MW-22S	MW-22S		MW-24S		MW-24S	MW-25S		MW-25S	MW-26S	MW-26S	MW-27S	MW-27S
		Date	6/13/2024	10/02/2024		6/13/2024		10/02/2024	6/17/2024		10/02/2024	6/13/2024	10/02/2024	6/17/2024	10/02/2024
		Sample Type	N	N	FD	N	FD	N	N	FD	N	N	N	N	N
Parameter	Analysis Location	Units													
Appendix III															
Boron, total	Lab	mg/l	**0.12**	**0.13**	**0.13**	**0.10**	**0.10**	**0.11**	**0.12**	**0.11**	**0.12**	**0.13**	**0.14**	**0.19**	**0.40**
Calcium, total	Lab	mg/l	**2.45**	**2.59**	**2.62**	**4.26**	**4.31**	**4.46**	**6.12**	**5.95**	**4.88**	**4.10**	**3.51**	**28.3**	**206**
Chloride	Lab	mg/l	**12.1**	**12.3**	**12.1**	**48.8**	**48.2**	**50.0**	**43.8**	**43.3**	**42.3**	**29.7**	**29.7**	**80.8**	**62.0**
Fluoride	Lab	mg/l	**1.69**	**1.59**	**1.72**	**1.43**	**1.42**	**1.44**	**1.29**	**1.29**	**1.30**	**1.34**	**1.33**	**1.17**	**1.27**
pH	Field	pH units	**8.18**	**8.19**	--	**8.13**	--	**8.14**	**8.18**	--	**8.19**	**8.15**	**8.17**	**8.03**	**8.08**
Solids, total dissolved	Lab	mg/l	**1590**	**1620**	**1610**	**1970**	**1960**	**1980**	**1900**	**1900**	**1900**	**1760**	**1730**	**2290**	**2160**
Sulfate, as SO4	Lab	mg/l	**233**	**228**	**235**	**61.9**	**61.9**	**64.7**	**24.6**	**24.7**	**40.2**	**45.1**	**41.0**	**252**	**6.83**

-- Not analyzed/Not available.

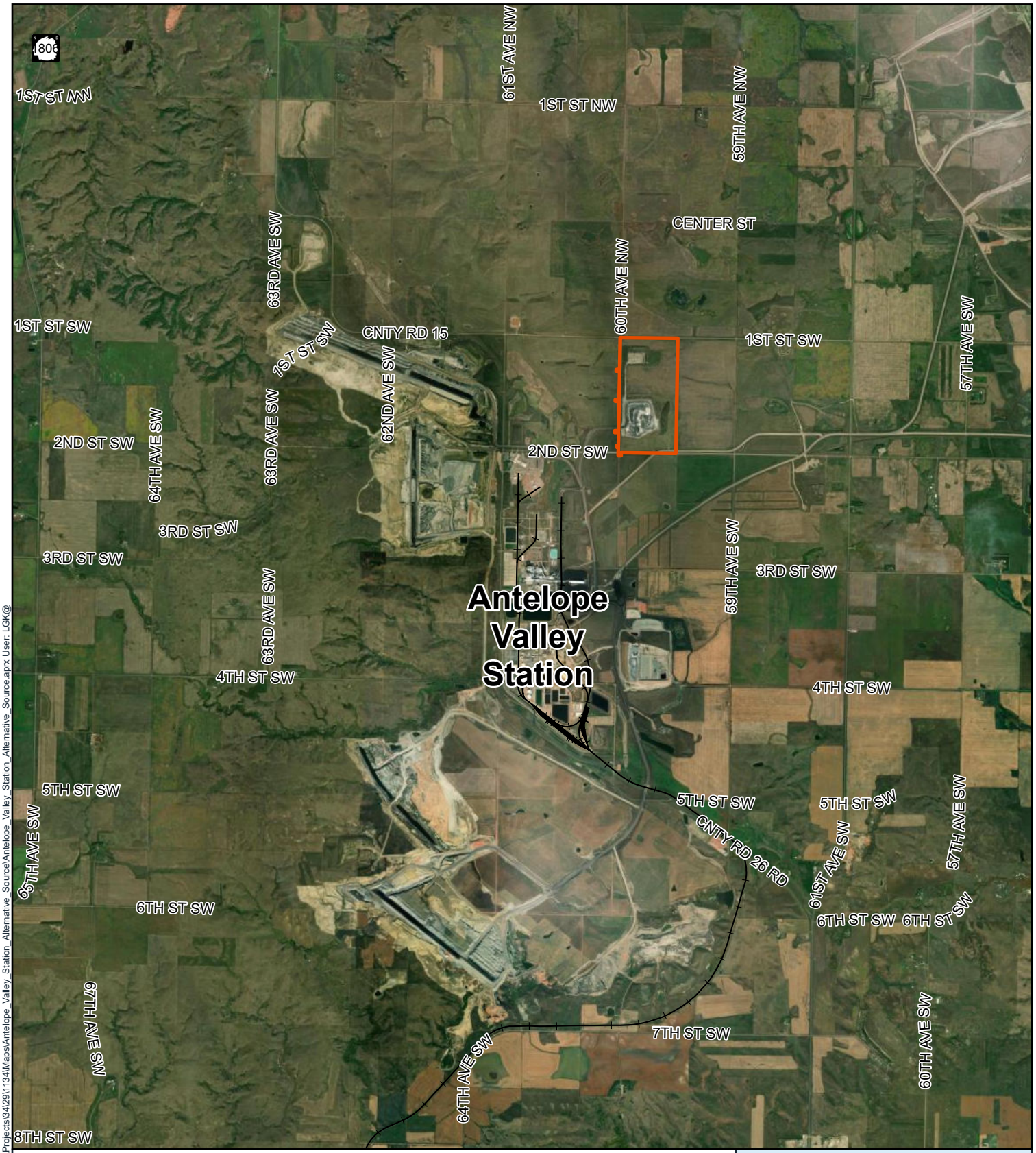
N Sample Type: Normal

FD: Sample Type: Field Duplicate

U: The analyte was analyzed for, but was not detected.

Figures

Figure 1 Site Location



Permit Boundary

Railroad

N

0 2,500 5,000

Feet

Imagery: ESRI 2024

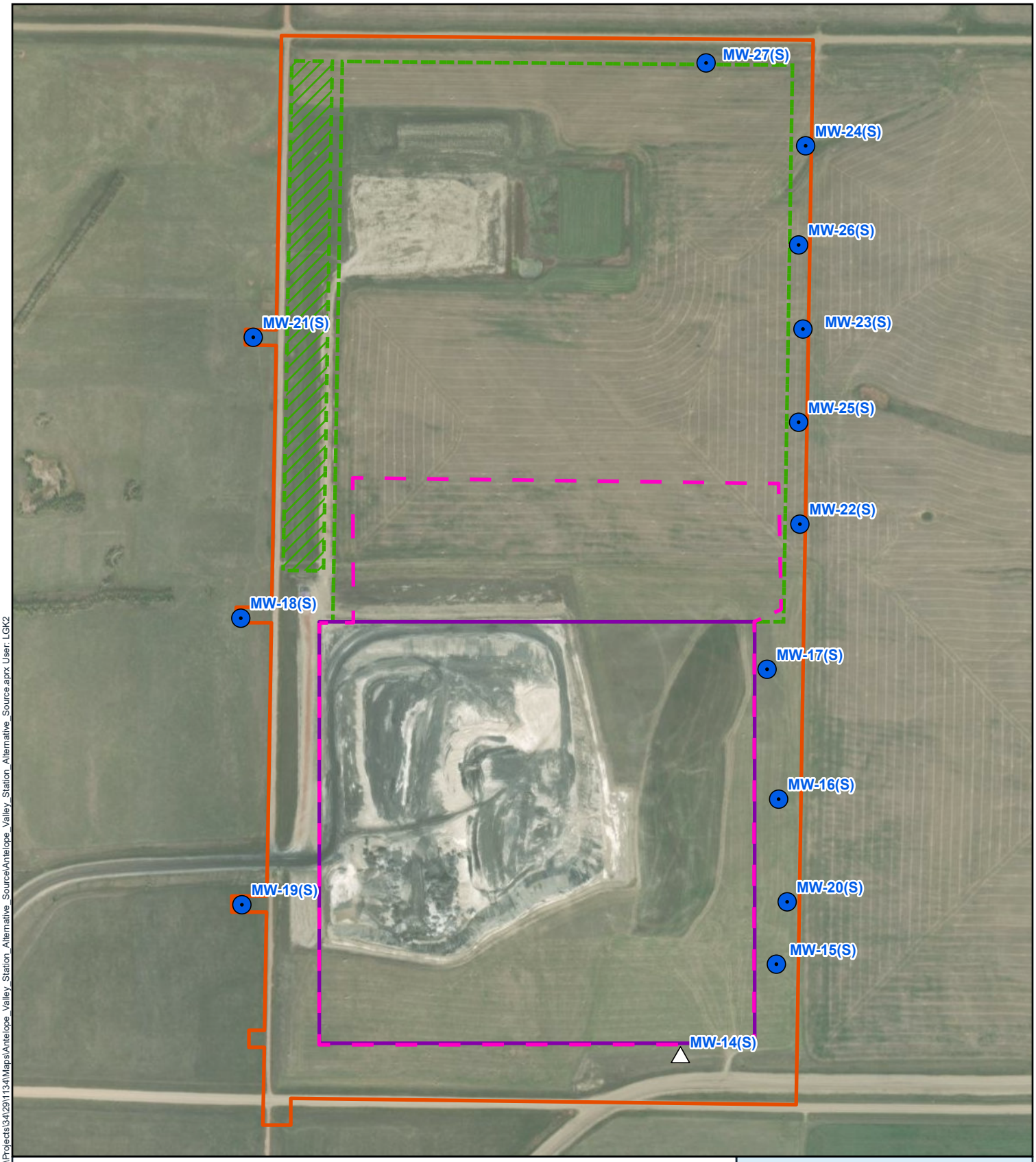
Site Location
Antelope Valley Station
2024 Annual Monitoring Report
Basin Electric Power Cooperative
Beulah, North Dakota

FIGURE 1

BARR

Barr footer: ArcGIS Pro 3.3.1, 2024-12-16, 12:57 File: I:\Projects\34\29\11\34\Maps\Antelope_Valley_Station_Alternative_Source\Antelope_Valley_Station_Alternative_Source.aprx User: LGK@

Figure 2 Monitoring Network



- Groundwater Monitoring System Wells
- Water Level Only Monitoring
- Permit Boundary
- Existing Landfill Limits
- Landfill Limits Expansion
- Leachate Management Area
- Limits of Ash as of 2025 (approximate)

N

0 300 600

Feet

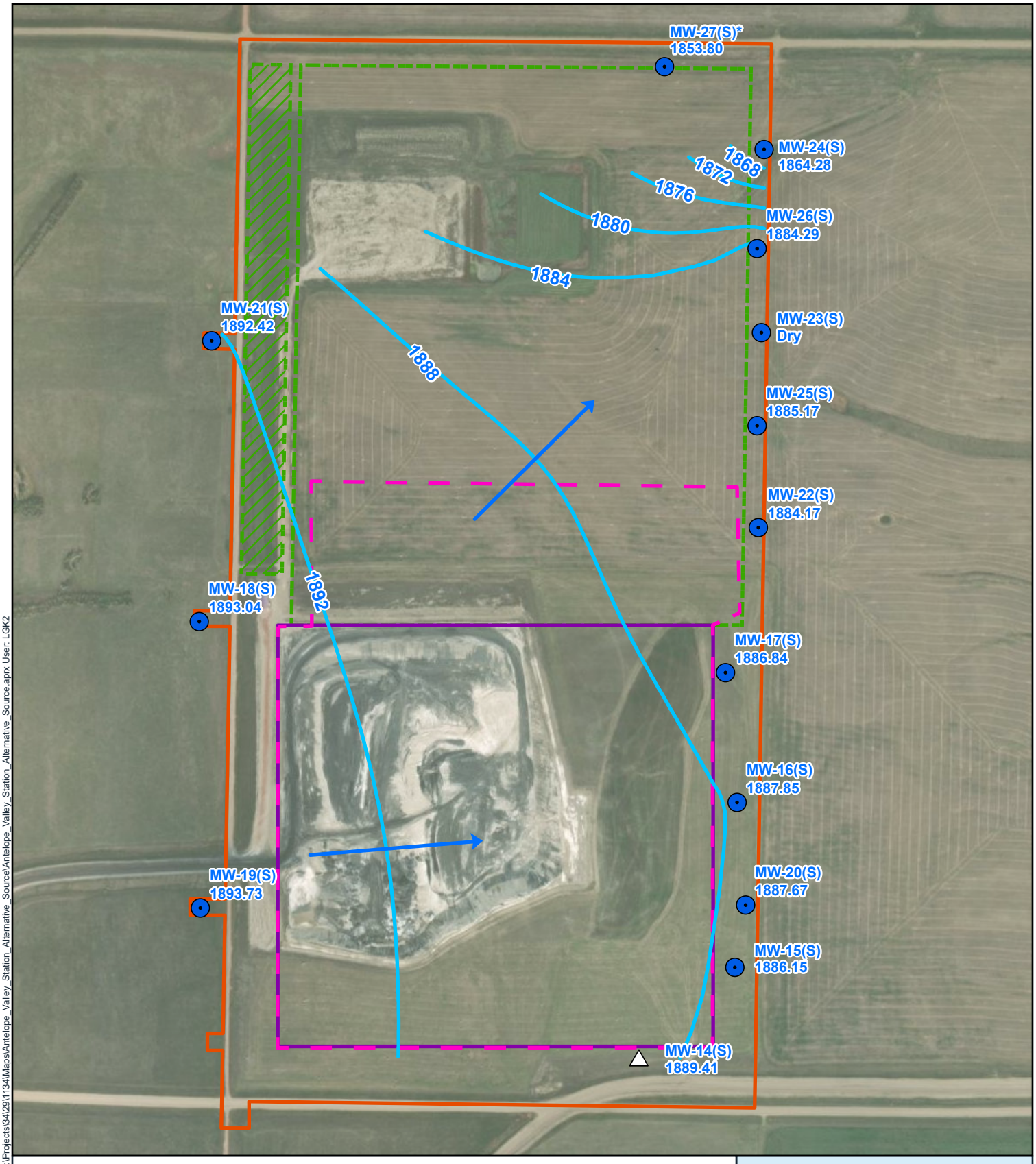
Imagery: ESRI 2024

Monitoring Network
Antelope Valley Station
2024 Annual Monitoring Report
Basin Electric Power Cooperative
Beulah, North Dakota

FIGURE 2

BARR

Figure 3 Spring 2024 Potentiometric Surface Map



- Groundwater Monitoring System Wells
- Water Level Only Monitoring
- Permit Boundary
- Existing Landfill Limits
- Landfill Limits Expansion
- Leachate Management Area
- Limits of Ash as of 2025 (approximate)
- Flow Direction
- Groundwater Contours

N

0 300 600

Feet

Imagery: ESRI 2024

**not used for contours because water elevations have not fully stabilized*

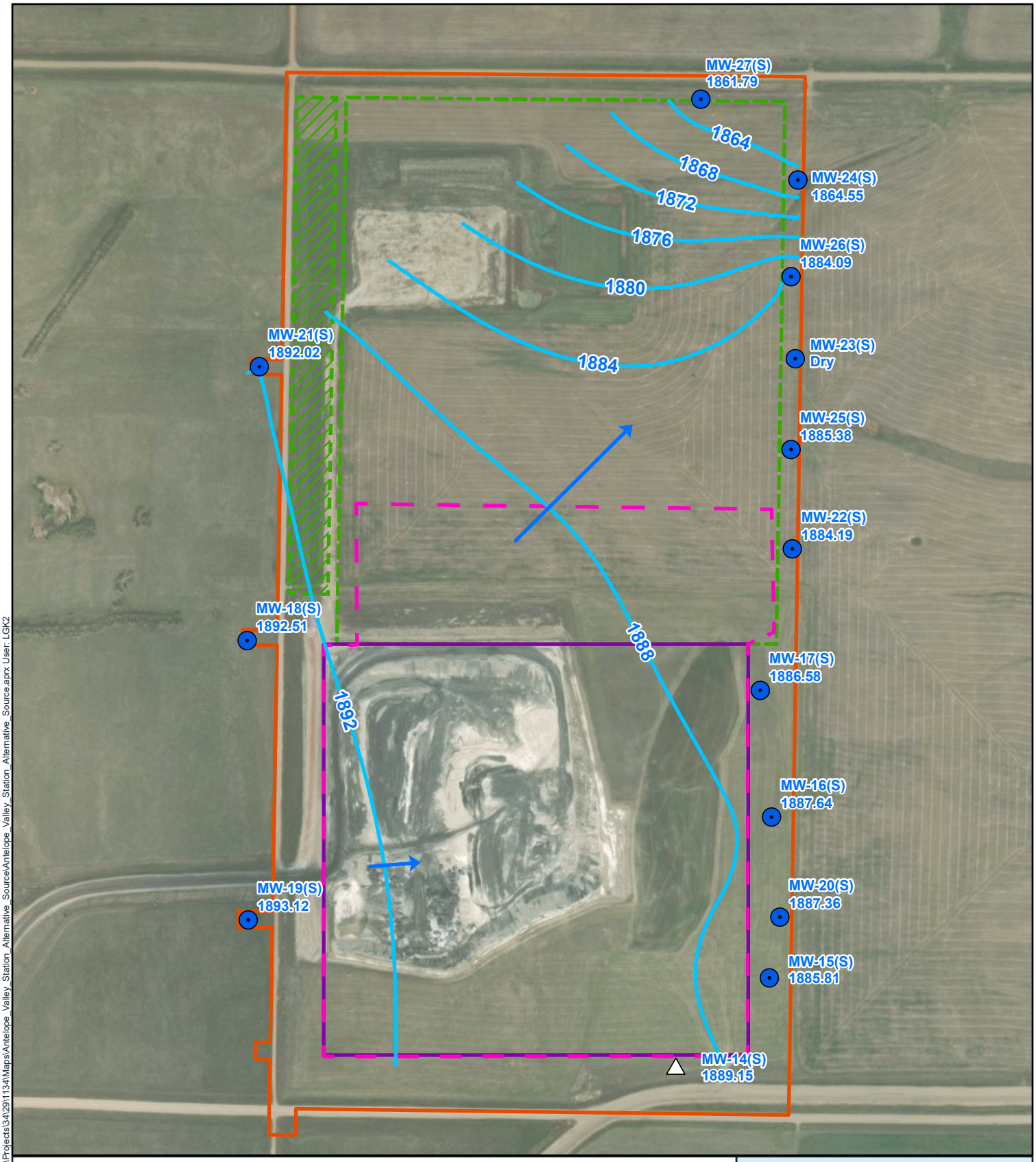
Spring 2024 Potentiometric Surface
Antelope Valley Station
2024 Annual Monitoring Report
Basin Electric Power Cooperative
Beulah, North Dakota

FIGURE 3

BARR

Barr footer: ArcGIS Pro 3.3.1, 2024-12-16, 12:57 File: I:\Projects\34\29\1134\Maps\Antelope_Valley_Station_Alternative_Source\Antelope_Valley_Station_Alternative_Source.aprx User: LGK2

Figure 4 Fall 2024 Potentiometric Surface Map



- Groundwater Monitoring System Wells
- Water Level Only Monitoring
- Permit Boundary
- Existing Landfill Limits
- Landfill Limits Expansion
- Leachate Management Area
- Limits of Ash as of 2025 (approximate)
- Flow Direction
- Groundwater Contour

N

0 300 600

Feet

Imagery: ESRI 2024

Fall 2024 Potentiometric Surface
Antelope Valley Station
2024 Annual Monitoring Report
Basin Electric Power Cooperative
Beulah, North Dakota

FIGURE 4

BARR

Barr footer: ArcGIS Pro 3.3.1, 2024-12-16, 12:57 File: I:\Projects\34291\1134\Maps\Antelope_Valley_Station_Alternative_Source\Antelope_Valley_Station_Alternative_Source.aprx User: LGK2

Appendices

Appendix A Lab and Field Reports

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.MVTL.com

Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS Landfill (51646) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

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

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646001 **Date Collected:** 06/11/2024 10:00 **Matrix:** Groundwater
Sample ID: MW-15s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**407**	mg/L	25	5		06/19/2024 11:38	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:08	
Calcium	**3.96**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:34	
Method: SM4500-Cl-E 2011							
Chloride	**13.2**	mg/L	2.0	1		06/18/2024 11:59	
Method: SM4500-F-C-2011							
Fluoride	**1.36**	mg/L	0.1	1		06/18/2024 12:38	
Method: USGS I-1750-85							
Total Dissolved Solids	**1880**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646002 **Date Collected:** 06/11/2024 10:25 **Matrix:** Groundwater
Sample ID: MW-20s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**69.9**	mg/L	5	1		06/19/2024 11:44	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:09	
Calcium	**4.80**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:37	
Method: SM4500-Cl-E 2011							
Chloride	**25.9**	mg/L	2.0	1		06/18/2024 12:00	
Method: SM4500-F-C-2011							
Fluoride	**1.17**	mg/L	0.1	1		06/18/2024 12:44	
Method: USGS I-1750-85							
Total Dissolved Solids	**1780**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646003 **Date Collected:** 06/12/2024 09:35 **Matrix:** Groundwater
Sample ID: MW-16s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**67.8**	mg/L	5	1		06/19/2024 11:45	
Method: EPA 6010D							
Boron	**0.14**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:09	
Calcium	**1.72**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:38	
Method: SM4500-Cl-E 2011							
Chloride	**32.7**	mg/L	2.0	1		06/18/2024 12:01	
Method: SM4500-F-C-2011							
Fluoride	**2.31**	mg/L	0.1	1		06/18/2024 12:50	
Method: USGS I-1750-85							
Total Dissolved Solids	**936**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646004 **Date Collected:** 06/12/2024 10:10 **Matrix:** Groundwater
Sample ID: MW-17s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**295**	mg/L	25	5		06/19/2024 11:50	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:10	
Calcium	**3.90**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:39	
Method: SM4500-Cl-E 2011							
Chloride	**12.7**	mg/L	2.0	1		06/18/2024 12:02	
Method: SM4500-F-C-2011							
Fluoride	**1.48**	mg/L	0.1	1		06/18/2024 12:56	
Method: USGS I-1750-85							
Total Dissolved Solids	**1700**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646005 **Date Collected:** 06/12/2024 11:06 **Matrix:** Groundwater
Sample ID: MW-19s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**811**	mg/L	25	5		06/19/2024 11:51	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:11	
Calcium	**4.18**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:43	
Method: SM4500-Cl-E 2011							
Chloride	**19.1**	mg/L	2.0	1		06/18/2024 12:03	
Method: SM4500-F-C-2011							
Fluoride	**0.67**	mg/L	0.1	1		06/18/2024 13:02	
Method: USGS I-1750-85							
Total Dissolved Solids	**2170**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646006 **Date Collected:** 06/12/2024 13:19 **Matrix:** Groundwater
Sample ID: MW-18s **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**564**	mg/L	25	5		06/19/2024 11:52	
Method: EPA 6010D							
Boron	<0.1	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:11	
Calcium	**4.70**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:44	
Method: SM4500-Cl-E 2011							
Chloride	**8.0**	mg/L	2.0	1		06/18/2024 12:04	
Method: SM4500-F-C-2011							
Fluoride	**1.23**	mg/L	0.1	1		06/18/2024 13:08	
Method: USGS I-1750-85							
Total Dissolved Solids	**1770**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646007 **Date Collected:** 06/11/2024 14:05 **Matrix:** Groundwater
Sample ID: AVS Leachate **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**503**	mg/L	25	5		06/19/2024 11:53	
Method: EPA 6010D							
Boron	**0.43**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 10:12	
Calcium	**124**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:46	
Method: SM4500-Cl-E 2011							
Chloride	**13.3**	mg/L	2.0	1		06/18/2024 12:06	
Method: SM4500-F-C-2011							
Fluoride	**0.46**	mg/L	0.1	1		06/18/2024 13:14	
Method: USGS I-1750-85							
Total Dissolved Solids	**906**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646008 **Date Collected:** 06/12/2024 07:45 **Matrix:** Groundwater
Sample ID: LOS Leachate **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**10600**	mg/L	250	50		06/19/2024 12:05	
Method: EPA 6010D							
Boron	**27.3**	mg/L	2.5	25	06/13/2024 17:15	07/02/2024 12:48	
Calcium	**400**	mg/L	10	10	06/13/2024 17:15	06/18/2024 13:47	
Method: SM4500-Cl-E 2011							
Chloride	**733**	mg/L	10.0	5		06/18/2024 12:14	
Method: SM4500-F-C-2011							
Fluoride	**2.73**	mg/L	0.1	1		06/18/2024 13:20	
Method: USGS I-1750-85							
Total Dissolved Solids	**15700**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51646009 **Date Collected:** 06/12/2024 11:06 **Matrix:** Groundwater
Sample ID: Duplicate **Date Received:** 06/13/2024 15:04 **Collector:** Client

Temp @ Receipt (C): 2.1 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**777**	mg/L	25	5		06/19/2024 11:55	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/13/2024 17:15	07/02/2024 12:46	
Calcium	**4.16**	mg/L	1	1	06/13/2024 17:15	06/18/2024 13:48	
Method: SM4500-Cl-E 2011							
Chloride	**19.3**	mg/L	2.0	1		06/18/2024 12:15	
Method: SM4500-F-C-2011							
Fluoride	**0.74**	mg/L	0.1	1		06/18/2024 13:26	
Method: USGS I-1750-85							
Total Dissolved Solids	**2150**	mg/L	10	1		06/14/2024 11:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QC Results Summary — WO #: 51646

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			100	102.0		85	115		
LFB			100	101.0		85	115		
LFB			100	100.0		85	115		
LFB			100	104.0		85	115		
LFB			100	99.5		85	115		
LFB			100	97.4		85	115		
LFB			100	109.0		85	115		
LFB			100	101.0		85	115		
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MS/MSD	51572002		100	100.0	96.8	85	115	2.6	20
MS/MSD	51572009		100	98.8	96.1	85	115	1.8	20
MS/MSD	51671003		500	96.1	96.1	85	115	0.0	20
MS/MSD	51714006		500	104.9	105.2	85	115	0.3	20
MS/MSD	51770005		100	89.5	87.7	85	115	2.0	20
MS/MSD	51856007		100	104.4	107.1	85	115	2.8	20
MS/MSD	51858003		500	92.9	101.3	85	115	4.7	20

Chloride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	101.0		90	110		
LFB			30	101.0		90	110		
LFB			30	100.0		90	110		
LFB			30	100.0		90	110		

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Chloride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	99.5		90	110		
LFB			30	98.9		90	110		
LFB			30	99.1		90	110		
LFB			30	98.8		90	110		
LFB			30	97.6		90	110		
LFB			30	96.7		90	110		
LFB			30	99.7		90	110		
LFB			30	97.9		90	110		
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MS/MSD	51175006		30	101.4	102.1	80	120	0.6	20
MS/MSD	51498017		30	102.7	102.2	80	120	0.3	20
MS/MSD	51510004		30	100.9	101.0	80	120	0.3	20
MS/MSD	51646006		30	98.5	99.1	80	120	0.5	20
MS/MSD	51770003		30	102.3	102.1	80	120	0.3	20
MS/MSD	51838003		30	90.6	90.0	80	120	0.3	20

Boron Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	102.0		85	115		
MB		<0.1							

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Calcium Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	111.0		85	115		
MB		<1							
PDS/PDSD	51175003		100	113.0	113.0	75	125	0.4	20
PDS/PDSD	51498003		100	105.0	105.0	75	125	0.1	20
PDS/PDSD	51498012		100	103.0	105.0	75	125	0.8	20
PDS/PDSD	51498022		100	104.0	103.0	75	125	0.1	20
DUP	51557001							17.5	20
PDS/PDSD	51572004		100	107.0	109.0	75	125	1.6	20
PDS/PDSD	51572008		100	111.0	111.0	75	125	0.3	20
PDS/PDSD	51572009		100	108.0	108.0	75	125	0.2	20
DUP	51646001							0.0	20
DUP	51646001							0.3	20
DUP	51646009							5.7	20
DUP	51646009							0.0	20
PDS/PDSD	51770003		100	111.0	109.0	75	125	1.2	20
PDS/PDSD	51770004		100	105.0	107.0	75	125	1.1	20

Fluoride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-F			3.06	106.0		83.99	111.11		
LFB-F			0.5	102.0		90	110		
LFB-F			0.5	102.0		90	110		
LFB-F			0.5	104.0		90	110		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	102.0		90	110		
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MS/MSD	51753001		0.5	94.0	94.0	80	120	0.0	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Fluoride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	51770005		0.5	102.0	102.0	80	120	0.0	20
MS/MSD	51856005		0.5	100.0	100.0	80	120	0.0	20
MS/MSD	51856007		0.5	102.0	106.0	80	120	3.9	20

Total Dissolved Solids Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			736	102.0		90.35	110.33		
MB		<10							
DUP	51057001							0.0	20

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Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coope
WO: 51646

Chain of Custody

Page __1___ of __1___

Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop. / Leland Olds Station / 3901 Highway 200A / Stanton, ND 58571	Account # 2040
Billing Address (indicate if different from above): Attn: Liabilities	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle
	Emails: mdihle@bepc.com aknutson@bepc.com
	Name of Sampler: Myles Shettler
	Ksolie@barr.com
	Quote Number
	Date Submitted: 6/13/2024
	Project Name/Number: AVS Landfill
	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW-15s	GW	6/11/2024	1000	2	N	B,Ca,Cl,F,SO4,TDS
002	MW-20s	GW	6/11/2024	1025	2	N	B,Ca,Cl,F,SO4,TDS
003	MW-16s	GW	6/12/2024	935	2	N	B,Ca,Cl,F,SO4,TDS
004	MW-17s	GW	6/12/2024	1010	2	N	B,Ca,Cl,F,SO4,TDS
005	MW-19s	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS
006	MW-18s	GW	6/12/2024	1319	2	N	B,Ca,Cl,F,SO4,TDS
007	AVS Leachate	SW	6/11/2024	1405	2	N	B,Ca,Cl,F,SO4,TDS
008	LOS Leachate	SW	6/12/2024	745	2	N	B,Ca,Cl,F,SO4,TDS
009	Duplicate	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS

Comments:

	Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
1.				[illegible]	13Jun24	1504	2.1C	(Y) / N	TN480
2.								Y / N	

Report Date: Wednesday, July 3, 2024 10:09:37 AM

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CCR Wells (51753) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

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

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51753001 **Date Collected:** 06/13/2024 10:52 **Matrix:** Groundwater
Sample ID: MW 26 S **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**45.1**	mg/L	5	1		06/19/2024 12:26	
Method: EPA 245.1							
Mercury	<0.0002	mg/L	0.0002	1	06/24/2024 09:50	06/24/2024 16:38	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	06/14/2024 15:51	07/02/2024 10:19	
Calcium	**4.10**	mg/L	1	1	06/14/2024 15:51	06/18/2024 14:07	
Lithium	**0.0490**	mg/L	0.02	1	06/14/2024 15:51	06/20/2024 14:15	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	06/14/2024 15:51	07/08/2024 18:31	
Arsenic	<0.002	mg/L	0.002	5	06/14/2024 15:51	07/08/2024 18:31	
Barium	**0.0486**	mg/L	0.002	5	06/14/2024 15:51	07/08/2024 18:31	
Beryllium	<0.0005	mg/L	0.0005	5	06/14/2024 15:51	07/08/2024 18:31	
Cadmium	<0.0005	mg/L	0.0005	5	06/14/2024 15:51	07/08/2024 18:31	
Chromium	<0.002	mg/L	0.002	5	06/14/2024 15:51	07/08/2024 18:31	
Cobalt	<0.002	mg/L	0.002	5	06/14/2024 15:51	07/08/2024 18:31	
Lead	<0.0005	mg/L	0.0005	5	06/14/2024 15:51	07/08/2024 18:31	
Molybdenum	**0.0052**	mg/L	0.002	5	06/14/2024 15:51	07/08/2024 18:31	
Selenium	<0.005	mg/L	0.005	5	06/14/2024 15:51	07/08/2024 18:31	
Thallium	<0.0005	mg/L	0.0005	5	06/14/2024 15:51	07/08/2024 18:31	
Method: SM4500-Cl-E 2011							
Chloride	**29.7**	mg/L	2.0	1		06/18/2024 14:06	
Method: SM4500-F-C-2011							
Fluoride	**1.34**	mg/L	0.1	1		06/18/2024 13:32	
Method: USGS I-1750-85							
Total Dissolved Solids	**1760**	mg/L	10	1		06/19/2024 10:55	

Report Date: Tuesday, July 9, 2024 12:04:00 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51753002 **Date Collected:** 06/13/2024 09:13 **Matrix:** Groundwater
Sample ID: MW 22 S **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**233**	mg/L	25	5		06/19/2024 12:20	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/14/2024 15:51	07/02/2024 10:22	
Calcium	**2.45**	mg/L	1	1	06/14/2024 15:51	06/18/2024 14:08	
Method: SM4500-Cl-E 2011							
Chloride	**12.1**	mg/L	2.0	1		06/18/2024 14:07	
Method: SM4500-F-C-2011							
Fluoride	**1.69**	mg/L	0.1	1		06/18/2024 14:24	
Method: USGS I-1750-85							
Total Dissolved Solids	**1590**	mg/L	10	1		06/19/2024 10:55	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51753003 **Date Collected:** 06/13/2024 12:03 **Matrix:** Groundwater
Sample ID: MW 24 S **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**61.9**	mg/L	5	1		06/19/2024 12:27	
Method: EPA 6010D							
Boron	**0.10**	mg/L	0.1	1	06/14/2024 15:51	07/02/2024 10:22	
Calcium	**4.26**	mg/L	1	1	06/14/2024 15:51	06/18/2024 14:10	
Method: SM4500-Cl-E 2011							
Chloride	**48.8**	mg/L	2.0	1		06/18/2024 14:08	
Method: SM4500-F-C-2011							
Fluoride	**1.43**	mg/L	0.1	1		06/18/2024 14:30	
Method: USGS I-1750-85							
Total Dissolved Solids	**1970**	mg/L	10	1		06/19/2024 10:55	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51753004 **Date Collected:** 06/13/2024 12:03 **Matrix:** Groundwater
Sample ID: DUP **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**61.9**	mg/L	5	1		06/19/2024 12:28	
Method: EPA 6010D							
Boron	**0.10**	mg/L	0.1	1	06/14/2024 15:51	07/02/2024 10:23	
Calcium	**4.31**	mg/L	1	1	06/14/2024 15:51	06/18/2024 14:11	
Method: SM4500-Cl-E 2011							
Chloride	**48.2**	mg/L	2.0	1		06/18/2024 14:10	
Method: SM4500-F-C-2011							
Fluoride	**1.42**	mg/L	0.1	1		06/18/2024 14:36	
Method: USGS I-1750-85							
Total Dissolved Solids	**1960**	mg/L	10	1		06/19/2024 10:55	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51753005 **Date Collected:** 06/13/2024 14:31 **Matrix:** Groundwater
Sample ID: MW 21 S **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**491**	mg/L	25	5		06/19/2024 12:48	
Method: EPA 6010D							
Boron	**0.11**	mg/L	0.1	1	06/14/2024 15:51	07/02/2024 10:23	
Calcium	**4.84**	mg/L	1	1	06/14/2024 15:51	06/18/2024 14:12	
Method: SM4500-Cl-E 2011							
Chloride	**19.2**	mg/L	2.0	1		06/18/2024 14:11	
Method: SM4500-F-C-2011							
Fluoride	**1.49**	mg/L	0.1	1		06/18/2024 14:43	
Method: USGS I-1750-85							
Total Dissolved Solids	**2100**	mg/L	10	1		06/19/2024 10:55	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QC Results Summary — WO #: 51753

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			100	97.4		85	115		
LFB			100	102.0		85	115		
LFB			100	101.0		85	115		
LFB			100	100.0		85	115		
LFB			100	99.5		85	115		
LFB			100	109.0		85	115		
LFB			100	101.0		85	115		
LFB			100	104.0		85	115		
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MS/MSD	51572002		100	100.0	96.8	85	115	2.6	20
MS/MSD	51572009		100	98.8	96.1	85	115	1.8	20
MS/MSD	51671003		500	96.1	96.1	85	115	0.0	20
MS/MSD	51714006		500	104.9	105.2	85	115	0.3	20
MS/MSD	51770005		100	89.5	87.7	85	115	2.0	20
MS/MSD	51856007		100	104.4	107.1	85	115	2.8	20
MS/MSD	51858003		500	92.9	101.3	85	115	4.7	20

Chloride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	97.6		90	110		
LFB			30	100.0		90	110		
LFB			30	100.0		90	110		
LFB			30	101.0		90	110		

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Chloride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	101.0		90	110		
LFB			30	98.9		90	110		
LFB			30	97.9		90	110		
LFB			30	99.5		90	110		
LFB			30	96.7		90	110		
LFB			30	99.7		90	110		
LFB			30	98.8		90	110		
LFB			30	99.1		90	110		
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MS/MSD	51175006		30	101.4	102.1	80	120	0.6	20
MS/MSD	51498017		30	102.7	102.2	80	120	0.3	20
MS/MSD	51510004		30	100.9	101.0	80	120	0.3	20
MS/MSD	51646006		30	98.5	99.1	80	120	0.5	20
MS/MSD	51770003		30	102.3	102.1	80	120	0.3	20
MS/MSD	51838003		30	90.6	90.0	80	120	0.3	20

Boron Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.5	105.0		85	115		
MB		<0.1							

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Boron				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	51753001		0.4	98.1	90.2	75	125	6.3	20

Calcium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	112.0		85	115		
MB		<1							
PDS/PDSD	51175003		100	113.0	113.0	75	125	0.4	20
PDS/PDSD	51498003		100	105.0	105.0	75	125	0.1	20
PDS/PDSD	51498012		100	103.0	105.0	75	125	0.8	20
PDS/PDSD	51498022		100	104.0	103.0	75	125	0.1	20
PDS/PDSD	51572004		100	107.0	109.0	75	125	1.6	20
PDS/PDSD	51572008		100	111.0	111.0	75	125	0.3	20
PDS/PDSD	51572009		100	108.0	108.0	75	125	0.2	20
DUP	51714006							0.7	20
PDS/PDSD	51770003		100	111.0	109.0	75	125	1.2	20
PDS/PDSD	51770004		100	105.0	107.0	75	125	1.1	20

Lithium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.5	104.0		85	115		
MB		<0.04							
MS/MSD	51753001		0.4	97.8	91.7	75	125	5.8	20

Antimony				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	103.0		80	120		
MB		<0.001							
MS/MSD	51753001		0.4	105.0	98.7	75	125	6.1	20

Arsenic				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	103.0		80	120		
MB		<0.002							
MS/MSD	51753001		0.4	106.0	100.0	75	125	6.3	20

Barium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	98.5		80	120		

Report Date: Tuesday, July 9, 2024 12:04:00 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Barium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MB		<0.002							
MS/MSD	51753001		0.4	97.8	91.8	75	125	5.6	20

Beryllium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	102.0		80	120		
MB		<0.0005							
MS/MSD	51753001		0.4	104.0	99.7	75	125	3.9	20

Cadmium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	101.0		80	120		
MB		<0.0005							
MS/MSD	51753001		0.4	100.0	93.2	75	125	7.0	20

Chromium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	107.0		80	120		
MB		<0.002							
MS/MSD	51753001		0.4	103.0	96.9	75	125	6.5	20

Cobalt				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	106.0		80	120		
MB		<0.002							
MS/MSD	51753001		0.4	102.0	94.9	75	125	6.9	20

Lead				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	107.0		80	120		
MB		<0.0005							
MS/MSD	51753001		0.4	100.0	96.3	75	125	3.8	20

Molybdenum				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	105.0		80	120		
MB		<0.002							
MS/MSD	51753001		0.4	100.0	94.7	75	125	5.6	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Selenium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	97.7		80	120		
MB		<0.005							
MS/MSD	51753001		0.4	103.0	97.8	75	125	5.7	20

Thallium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	107.0		80	120		
MB		<0.0005							
MS/MSD	51753001		0.4	98.3	94.3	75	125	4.2	20

Mercury — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			0.002	98.8		85	115		
LFB			0.002	94.8		85	115		
LFB			0.002	91.4		85	115		
LRB		<0.0002							
MB		<0.0002							
MB		<0.0002							
MS/MSD	51498002		0.002	96.3	97.7	70	130	5.1	20
MS/MSD	51498012		0.002	87.6	90.8	70	130	0.0	20
MS/MSD	51498022		0.002	96.8	100.0	70	130	5.1	20
MS/MSD	51753001		0.002	93.2	98.8	70	130	5.1	20
MS/MSD	51856007		0.002	91.4	92.8	70	130	0.0	20

Fluoride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-F			3.06	106.0		83.99	111.11		
LFB-F			0.5	102.0		90	110		
LFB-F			0.5	102.0		90	110		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	104.0		90	110		
LFB-F			0.5	102.0		90	110		
MB-F		<0.1							
MB-F		<0.1							

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Fluoride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MS/MSD	51753001		0.5	94.0	94.0	80	120	0.0	20
MS/MSD	51770005		0.5	102.0	102.0	80	120	0.0	20
MS/MSD	51856005		0.5	100.0	100.0	80	120	0.0	20
MS/MSD	51856007		0.5	102.0	106.0	80	120	3.9	20

Total Dissolved Solids Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			736	101.0		90.35	110.33		
CRM			736	100.0		90.35	110.33		
MB		<10							
MB		<10							
DUP	51856005							1.5	20
DUP	52102002							0.7	20
DUP	52104004							0.0	20
DUP	52104013							0.0	20

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Basin Electric Power Coop
WO: 51753

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
Billing Address (indicate if different from above)	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
	Quote Number	Date Submitted 6/14/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	6/13/2024	1052	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 22 S	GW	6/13/2024	913	2	N	B, Ca, Cl, F, SO_4, TDS
003	MW 24 S	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
004	DUP	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
005	MW 21 S	GW	6/13/2024	1431	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/14/2024			14Jun24	14:51	4.5°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CCR Wells (51754) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

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
SUBv	Energy Labs Casper	2393 Salt Creek Highway, Casper. WY 82601	307-235-0515	CERT

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 51754001 **Date Collected:** 06/13/2024 10:52 **Matrix:** Groundwater
Sample ID: MW 26 S **Date Received:** 06/14/2024 14:51 **Collector:** Client

Temp @ Receipt (C): 4.5 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		07/24/2024 13:04	
Radium 228	See Attached			1		07/24/2024 13:04	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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ANALYTICAL SUMMARY REPORT

July 20, 2024

Minnesota Valley Testing Laboratories
1126 N Front St
New Ulm, MN 56073-1176

Work Order: C24060726 Quote ID: C15480
Project Name: 51754

Energy Laboratories, Inc. Casper WY received the following 1 sample for Minnesota Valley Testing Laboratories on 6/19/2024 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C24060726-001	51754-001, MW 26 S	06/13/24 10:52	06/19/24	Groundwater	pH Check for Nitric Radiochem FIRST Radium 226 + Radium 228, Total Radium 226, Total Radium 228, Total

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy, Casper, WY 82601-9601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

Energy Laboratories, Inc. verifies the reported results for the analysis has been technically reviewed and approved for release.

If you have any questions regarding these test results, please contact your Project Manager.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 51754
Lab ID: C24060726-001
Client Sample ID: 51754-001, MW 26 S

Report Date: 07/20/24
Collection Date: 06/13/24 10:52
DateReceived: 06/19/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.08	pCi/L	U			E903.0	07/02/24 15:33 / alb
Radium 226 precision (±)	0.2	pCi/L				E903.0	07/02/24 15:33 / alb
Radium 226 MDC	0.3	pCi/L				E903.0	07/02/24 15:33 / alb
Radium 228	0.5	pCi/L	U			RA-05	06/27/24 13:47 / trs
Radium 228 precision (±)	0.8	pCi/L				RA-05	06/27/24 13:47 / trs
Radium 228 MDC	1.2	pCi/L				RA-05	06/27/24 13:47 / trs
Radium 226 + Radium 228	0.7	pCi/L	U			A7500-RA	07/03/24 11:19 / dmf
Radium 226 + Radium 228 precision (±)	0.8	pCi/L				A7500-RA	07/03/24 11:19 / dmf
Radium 226 + Radium 228 MDC	1.2	pCi/L				A7500-RA	07/03/24 11:19 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories **Work Order:** C24060726 **Report Date:** 07/03/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-11355
Lab ID: LCS-RA226-11355	3	Laboratory Control Sample				Run: TENNELEC-3_240621B			07/02/24 13:28	
Radium 226		9.9	pCi/L		99	70	130			
Radium 226 precision (±)		1.9	pCi/L							
Radium 226 MDC		0.23	pCi/L							
Lab ID: MB-RA226-11355	3	Method Blank				Run: TENNELEC-3_240621B			07/02/24 13:28	
Radium 226		0.06	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C24060770-007ADUP	3	Sample Duplicate				Run: TENNELEC-3_240621B			07/02/24 15:33	
Radium 226		0.074	pCi/L					180	30	UR
Radium 226 precision (±)		0.15	pCi/L							
Radium 226 MDC		0.24	pCi/L							

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than or equal to the limit of 3, the RER result is 0.33.

Qualifiers:

RL - Analyte Reporting Limit
R - Relative Percent Difference (RPD) exceeds advisory limit
ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)

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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories **Work Order:** C24060726 **Report Date:** 07/03/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-7423
Lab ID: LCS-228-RA226-11355	3	Laboratory Control Sample				Run: TENNELEC-4_240621B				06/27/24 13:47
Radium 228		9.8	pCi/L		94	70	130			
Radium 228 precision (±)		2.0	pCi/L							
Radium 228 MDC		1.1	pCi/L							
Lab ID: MB-RA226-11355	3	Method Blank				Run: TENNELEC-4_240621B				06/27/24 13:47
Radium 228		-0.3	pCi/L							U
Radium 228 precision (±)		0.6	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C24060770-007ADUP	3	Sample Duplicate				Run: TENNELEC-4_240621B				06/27/24 13:47
Radium 228		-0.042	pCi/L					130	30	UR
Radium 228 precision (±)		0.62	pCi/L							
Radium 228 MDC		1.0	pCi/L							

- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than or equal to the limit of 3, the RER result is 0.17.

Qualifiers:

RL - Analyte Reporting Limit
R - Relative Percent Difference (RPD) exceeds advisory limit
ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Work Order Receipt Checklist

Minnesota Valley Testing Laboratories C24060726

Login completed by: Lisa X. Quezada Date Received: 6/19/2024
Reviewed by: cjohnson Received by: CCS
Reviewed Date: 6/27/2024 Carrier name: UPS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.7°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Trip Blanks and/or Blind Duplicate samples are assigned the earliest collection time for the associated requested analysis in order to evaluate the holding time unless specifically indicated.

Contact and Corrective Action Comments:

The sample for Radionuclides was received at pH~7. Nitric acid (15 mL) was added to preserve to pH <2. In accordance with the method, these samples must held for 16 hours prior to analysis. LQ 6/20/24

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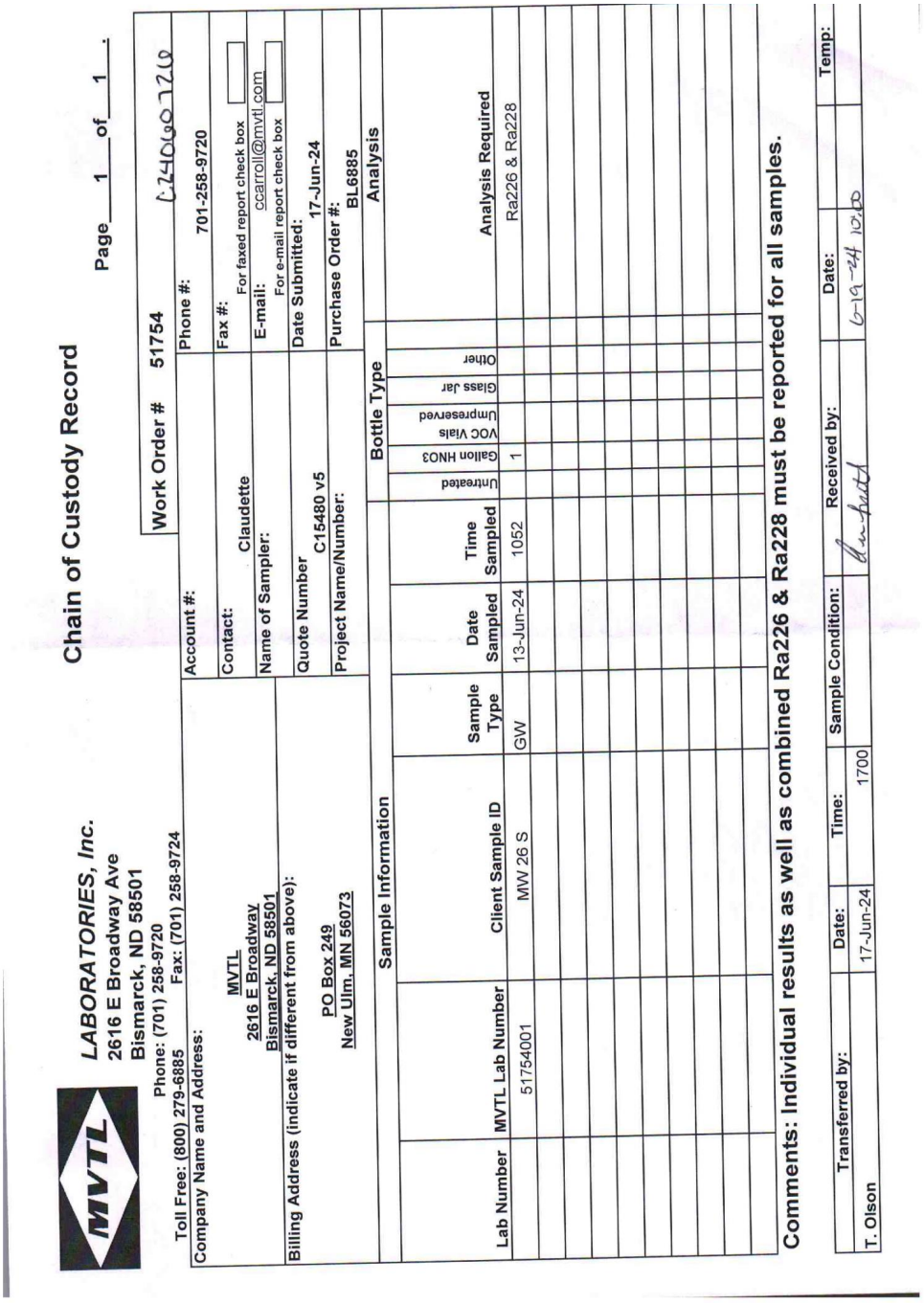

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Chain of Custody Record

Page 1 of 1

Work Order # 51754 C240690720

Company Name and Address: MVTL, 2616 E Broadway, Bismarck, ND 58501
Account #:
Contact: Claudette
Name of Sampler:
Phone #: 701-258-9720
Fax #: For faxed report check box
E-mail: ccarroll@mvtl.com For e-mail report check box
Date Submitted: 17-Jun-24
Quote Number C15480 v5
Project Name/Number:
Purchase Order #: BL6885

Billing Address (indicate if different from above): PO Box 249, New Ulm, MN 56073

Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Untreated	Gallon HNO3	VOC Vials Unpreserved	Glass Jar	Other	Analysis Required
	51754001	MW 26 S	GW	13-Jun-24	1052		1				Ra226 & Ra228

Comments: Individual results as well as combined Ra226 & Ra228 must be reported for all samples.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	17-Jun-24	1700		[signature]	6-19-24 1010	

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Basin Electric Power Coop
WO: 51754

Chain of Custody

Page 1 of 1

Company Name and Address: Basin Electric Power Coop., Leland Olds Station, 3901 Highway 200A, Stanton, ND 58571	Work Order # (Lab Use Only)
Billing Address (indicate if different from above)	Account # 2040
	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle
	Emails: mdihle@bepc.com aknutson@bepc.com; Ksolie@barr.com
	Name of Sampler: mls
	Quote Number
	Date Submitted: 6/14/2024
	Project Name/Number: AVS CCR Wells
	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	6/13/2024	1052	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
—	MW 22 S	GW	6/13/2024	913	2	N	B, Ca, Cl, F, SO_4, TDS
—	MW 24 S	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
—	DUP	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
—	MW 21 S	GW	6/13/2024	1431	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/14/2024			14Jun24	14.51	4.5°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CCR Wells (52087) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

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

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 52087001 **Date Collected:** 06/17/2024 10:40 **Matrix:** Groundwater
Sample ID: MW 27 S **Date Received:** 06/18/2024 14:46 **Collector:** Client

Temp @ Receipt (C): 3.4 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**252**	mg/L	25	5		06/26/2024 09:08	
Method: EPA 245.1							
Mercury	<0.0002	mg/L	0.0002	1	06/27/2024 11:38	06/27/2024 13:49	
Method: EPA 6010D							
Boron	**0.19**	mg/L	0.1	1	06/19/2024 07:07	07/02/2024 10:38	
Calcium	**28.3**	mg/L	1	1	06/19/2024 07:07	06/25/2024 09:41	
Lithium	**0.0755**	mg/L	0.02	1	06/19/2024 07:07	06/20/2024 14:28	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	06/19/2024 07:07	07/09/2024 12:26	
Arsenic	**0.0116**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 12:26	
Barium	**0.3396**	mg/L	0.004	10	06/19/2024 07:07	07/09/2024 13:43	
Beryllium	**0.0015**	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 12:26	
Cadmium	**0.0007**	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 12:26	
Chromium	**0.0863**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 12:26	
Cobalt	**0.0141**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 12:26	
Lead	**0.0206**	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 12:26	
Molybdenum	**0.1457**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 12:26	
Selenium	<0.005	mg/L	0.005	5	06/19/2024 07:07	07/09/2024 12:26	
Thallium	<0.0005	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 12:26	
Method: SM4500-Cl-E 2011							
Chloride	**80.8**	mg/L	10.0	5		06/19/2024 14:54	
Method: SM4500-F-C-2011							
Fluoride	**1.17**	mg/L	0.1	1		06/19/2024 21:17	
Method: USGS I-1750-85							
Total Dissolved Solids	**2290**	mg/L	10	1		06/19/2024 10:55	

Report Date: Wednesday, July 10, 2024 2:00:13 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 52087002 **Date Collected:** 06/17/2024 09:20 **Matrix:** Groundwater
Sample ID: MW 25 S **Date Received:** 06/18/2024 14:46 **Collector:** Client

Temp @ Receipt (C): 3.4 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**24.6**	mg/L	5	1		06/26/2024 09:21	
Method: EPA 245.1							
Mercury	<0.0002	mg/L	0.0002	1	06/27/2024 11:38	06/27/2024 13:49	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	06/19/2024 07:07	07/02/2024 10:39	
Calcium	**6.12**	mg/L	1	1	06/19/2024 07:07	06/25/2024 09:42	
Lithium	**0.0430**	mg/L	0.02	1	06/19/2024 07:07	06/20/2024 14:29	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	06/19/2024 07:07	07/09/2024 13:04	
Arsenic	<0.002	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 13:04	
Barium	**0.0994**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 13:04	
Beryllium	<0.0005	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 13:04	
Cadmium	<0.0005	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 13:04	
Chromium	**0.0025**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 13:04	
Cobalt	<0.002	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 13:04	
Lead	**0.0006**	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 13:04	
Molybdenum	**0.0033**	mg/L	0.002	5	06/19/2024 07:07	07/09/2024 13:04	
Selenium	<0.005	mg/L	0.005	5	06/19/2024 07:07	07/09/2024 13:04	
Thallium	<0.0005	mg/L	0.0005	5	06/19/2024 07:07	07/09/2024 13:04	
Method: SM4500-Cl-E 2011							
Chloride	**43.8**	mg/L	2.0	1		06/19/2024 14:55	
Method: SM4500-F-C-2011							
Fluoride	**1.29**	mg/L	0.1	1		06/19/2024 21:23	
Method: USGS I-1750-85							
Total Dissolved Solids	**1900**	mg/L	10	1		06/19/2024 10:55	

Report Date: Wednesday, July 10, 2024 2:00:13 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 52087003 **Date Collected:** 06/17/2024 09:20 **Matrix:** Groundwater
Sample ID: DUP **Date Received:** 06/18/2024 14:46 **Collector:** Client

Temp @ Receipt (C): 3.4 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**24.7**	mg/L	5	1		06/26/2024 09:22	
Method: EPA 6010D							
Boron	**0.11**	mg/L	0.1	1	06/19/2024 07:07	07/02/2024 10:40	
Calcium	**5.95**	mg/L	1	1	06/19/2024 07:07	06/25/2024 09:44	
Method: SM4500-Cl-E 2011							
Chloride	**43.3**	mg/L	2.0	1		06/19/2024 14:56	
Method: SM4500-F-C-2011							
Fluoride	**1.29**	mg/L	0.1	1		06/19/2024 21:29	
Method: USGS I-1750-85							
Total Dissolved Solids	**1900**	mg/L	10	1		06/19/2024 10:55	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QC Results Summary — WO #: 52087

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			100	104.0		85	115		
LFB			100	92.5		85	115		
LFB			100	93.2		85	115		
LFB			100	96.0		85	115		
LFB			100	89.1		85	115		
LFB			100	98.1		85	115		
LFB			100	92.7		85	115		
LFB			100	98.8		85	115		
LFB			100	92.6		85	115		
LFB			100	94.4		85	115		
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MS/MSD	52101007		500	82.2	80.1	85	115	2.2	20
MS/MSD	52104002		500	72.3	77.1	85	115	2.5	20
MS/MSD	52104004		1000	79.6	82.5	85	115	2.1	20
MS/MSD	52281002		1000	75.2	77.5	85	115	1.8	20
MS/MSD	52396002		1000	69.0	72.5	85	115	2.4	20
MS/MSD	52454005		100	97.1	96.0	85	115	1.1	20
MS/MSD	52461002		100	96.3	96.0	85	115	0.3	20
MS/MSD	52575002		500	70.7	73.4	85	115	1.8	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	52649007		100	73.1	68.5	85	115	3.5	20

Chloride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	95.1		90	110		
LFB			30	96.9		90	110		
LFB			30	98.8		90	110		
LFB			30	103.0		90	110		
LFB			30	102.0		90	110		
LFB			30	97.0		90	110		
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MS/MSD	51925001		30	113.4	118.6	80	120	0.8	20
MS/MSD	52104001		30	106.8	102.8	80	120	2.3	20
MS/MSD	52104004		30	110.0	110.3	80	120	0.2	20

Boron — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	102.0		85	115		
MB		<0.1							
MS/MSD	51858003		0.4	98.4	100.0	70	130	0.6	20
MS/MSD	52087003		0.4	93.2	94.2	70	130	0.8	20

Calcium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	111.0		85	115		
MB		<1							
PDS/PDSD	51856004		100	108.0	107.0	75	125	0.8	20
DUP	51858002							5.6	20
PDS/PDSD	52101002		100	114.0	113.0	75	125	0.7	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Calcium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PDS/PDSD	52101008		100	111.0	113.0	75	125	1.8	20
PDS/PDSD	52104004		100	104.0	104.0	75	125	0.1	20
PDS/PDSD	52104011							0.8	20
PDS/PDSD	52281002		100	92.4	92.3	75	125	0.1	20
PDS/PDSD	52429003		100	92.7	92.2	75	125	0.2	20
PDS/PDSD	52429006		100	101.0	101.0	75	125	0.3	20
PDS/PDSD	52461002		100	99.3	99.3	75	125	0.1	20
PDS/PDSD	52467001		100	96.0	95.5	75	125	0.3	20

Lithium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	102.0		85	115		
MB		<0.04							
MS/MSD	51858003		0.4	94.6	95.0	70	130	0.4	20

Antimony — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	96.6		80	120		
MB		<0.001							
MS/MSD	51858003		0.4	103.0	99.6	75	125	3.2	20

Arsenic — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	96.2		80	120		
MB		<0.002							
MS/MSD	51858003		0.4	103.0	98.0	75	125	4.7	20

Barium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	89.8		80	120		
MB		<0.002							
MS/MSD	51858003		0.4	98.0	90.4	75	125	7.1	20

Beryllium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	103.0		80	120		
MB		<0.0005							
MS/MSD	51858003		0.4	116.0	106.0	75	125	9.0	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Cadmium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	95.6		80	120		
MB		<0.0005							
MS/MSD	51858003		0.4	99.6	95.3	75	125	4.4	20

Chromium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	96.7		80	120		
MB		<0.002							
MS/MSD	51858003		0.4	96.0	93.4	75	125	2.9	20

Cobalt — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	94.5		80	120		
MB		<0.002							
MS/MSD	51858003		0.4	93.6	92.1	75	125	1.3	20

Lead — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	94.9		80	120		
MB		<0.0005							
MS/MSD	51858003		0.4	99.0	92.9	75	125	6.3	20

Molybdenum — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	95.7		80	120		
MB		<0.002							
MS/MSD	51858003		0.4	93.9	91.8	75	125	2.2	20

Selenium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	97.5		80	120		
MB		<0.005							
MS/MSD	51858003		0.4	105.0	100.0	75	125	4.4	20

Thallium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	95.7		80	120		
MB		<0.0005							
MS/MSD	51858003		0.4	97.6	91.7	75	125	6.1	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Mercury — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			0.002	90.7		85	115		
LFB			0.002	100.0		85	115		
LFB			0.002	107.0		85	115		
LRB		<0.0002							
LRB		<0.0002							
MB		<0.0002							
MS/MSD	52104001		0.002	114.0	113.0	70	130	4.4	20
MS/MSD	52104004		0.002	100.0	102.0	70	130	0.0	20
MS/MSD	52281002		0.002	90.9	92.2	70	130	0.0	20
MS/MSD	52281006		0.002	106.0	101.0	70	130	4.9	20

Fluoride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-F			3.06	99.7		83.99	111.11		
LFB-F			0.5	98.0		90	110		
LFB-F			0.5	96.0		90	110		
LFB-F			0.5	96.0		90	110		
LFB-F			0.5	98.0		90	110		
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MS/MSD	52087002		0.5	102.0	102.0	80	120	0.0	20
MS/MSD	52103003		0.5	104.0	100.0	80	120	1.9	20
MS/MSD	52104004		0.5	102.0	102.0	80	120	0.0	20

Total Dissolved Solids — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			736	100.0		90.35	110.33		
CRM			736	101.0		90.35	110.33		
MB		<10							
MB		<10							
DUP	51856005							1.5	20

Report Date: Wednesday, July 10, 2024 2:00:13 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Total Dissolved Solids Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
DUP	52102002							0.7	20
DUP	52104004							0.0	20
DUP	52104013							0.0	20

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Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coop
WO: 52087

Chain of Custody

Page 1 of 1

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	**Account #** 2040	**Work Order #** Lab Use Only
Billing Address (indicate if different from above)	**Contact** Mark Dihle	**Phone #** 701-745-7238 701-557-5488
	Name of Sampler mls	**Emails** mdihle@bepc.com aknutson@bepc.com Ksolie@barr.com
	Quote Number	**Date Submitted** 6/18/2024
	Project Name/Number AVS CCR Wells	**Purchase Order #** 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CCR Wells (52088) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

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
SUBv	Energy Labs Casper	2393 Salt Creek Highway, Casper. WY 82601	307-235-0515	CERT

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 52088001 **Date Collected:** 06/17/2024 10:40 **Matrix:** Groundwater
Sample ID: MW 27 S **Date Received:** 06/18/2024 14:46 **Collector:** Client

Temp @ Receipt (C): 3.4 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		08/07/2024 08:29	
Radium 228	See Attached			1		08/07/2024 08:29	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 52088002 **Date Collected:** 06/17/2024 09:20 **Matrix:** Groundwater
Sample ID: MW 25 S **Date Received:** 06/18/2024 14:46 **Collector:** Client

Temp @ Receipt (C): 3.4 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		08/07/2024 08:29	
Radium 228	See Attached			1		08/07/2024 08:29	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

ANALYTICAL SUMMARY REPORT

August 06, 2024

Minnesota Valley Testing Laboratories
1126 N Front St
New Ulm, MN 56073-1176

Work Order: C24060860 Quote ID: C15480
Project Name: 52088

Energy Laboratories, Inc. Casper WY received the following 2 samples for Minnesota Valley Testing Laboratories on 6/24/2024 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C24060860-001	52088001, MW 27 S	06/17/24 10:40	06/24/24	Groundwater	Radium 226 + Radium 228, Total Radium 226, Total Radium 228, Total
C24060860-002	52088002, MW 25 S	06/17/24 9:20	06/24/24	Groundwater	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy, Casper, WY 82601-9601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

Energy Laboratories, Inc. verifies the reported results for the analysis has been technically reviewed and approved for release.

If you have any questions regarding these test results, please contact your Project Manager.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 52088
Lab ID: C24060860-001
Client Sample ID: 52088001, MW 27 S

Report Date: 08/06/24
Collection Date: 06/17/24 10:40
DateReceived: 06/24/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	3.2	pCi/L				E903.0	07/22/24 14:34 / alb
Radium 226 precision (±)	1	pCi/L				E903.0	07/22/24 14:34 / alb
Radium 226 MDC	1.2	pCi/L				E903.0	07/22/24 14:34 / alb
Radium 228	2.9	pCi/L	U			RA-05	07/17/24 15:37 / trs
Radium 228 precision (±)	3.5	pCi/L				RA-05	07/17/24 15:37 / trs
Radium 228 MDC	5.4	pCi/L				RA-05	07/17/24 15:37 / trs
Radium 226 + Radium 228	5.9	pCi/L				A7500-RA	07/25/24 11:05 / dmf
Radium 226 + Radium 228 precision (±)	3.6	pCi/L				A7500-RA	07/25/24 11:05 / dmf
Radium 226 + Radium 228 MDC	5.5	pCi/L				A7500-RA	07/25/24 11:05 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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Gillette, WY 307.686.7175 • Helena, MT 406.442.0711

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 52088
Lab ID: C24060860-002
Client Sample ID: 52088002, MW 25 S

Report Date: 08/06/24
Collection Date: 06/17/24 09:20
DateReceived: 06/24/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.3	pCi/L	U			E903.0	07/08/24 11:22 / alb
Radium 226 precision (±)	0.2	pCi/L				E903.0	07/08/24 11:22 / alb
Radium 226 MDC	0.3	pCi/L				E903.0	07/08/24 11:22 / alb
Radium 228	1.1	pCi/L	U			RA-05	07/02/24 12:38 / trs
Radium 228 precision (±)	0.9	pCi/L				RA-05	07/02/24 12:38 / trs
Radium 228 MDC	1.3	pCi/L				RA-05	07/02/24 12:38 / trs
Radium 226 + Radium 228	0.8	pCi/L	U			A7500-RA	07/09/24 11:24 / dmf
Radium 226 + Radium 228 precision (±)	0.9	pCi/L				A7500-RA	07/09/24 11:24 / dmf
Radium 226 + Radium 228 MDC	1.3	pCi/L				A7500-RA	07/09/24 11:24 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected at Minimum Detectable Concentration (MDC)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories **Work Order:** C24060860 **Report Date:** 07/25/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-11357
Lab ID: LCS-RA226-11357	3	Laboratory Control Sample				Run: TENNELEC-3_240625D				07/08/24 11:22
Radium 226		12	pCi/L		119	70	130			
Radium 226 precision (±)		2.3	pCi/L							
Radium 226 MDC		0.22	pCi/L							
Lab ID: MB-RA226-11357	3	Method Blank				Run: TENNELEC-3_240625D				07/08/24 11:22
Radium 226		0.2	pCi/L							
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C24060862-002AMS	3	Sample Matrix Spike				Run: TENNELEC-3_240625D				07/08/24 11:22
Radium 226		11	pCi/L		108	70	130			
Radium 226 precision (±)		2.2	pCi/L							
Radium 226 MDC		0.20	pCi/L							
Lab ID: C24060862-002AMSD	3	Sample Matrix Spike Duplicate				Run: TENNELEC-3_240625D				07/08/24 13:37
Radium 226		11	pCi/L		105	70	130	3.2	30	
Radium 226 precision (±)		2.1	pCi/L							
Radium 226 MDC		0.19	pCi/L							
- The RER result is 0.12.										
Method: E903.0										Batch: RA226-11368
Lab ID: LCS-RA226-11368	3	Laboratory Control Sample				Run: TENNELEC-3_240709A				07/22/24 10:34
Radium 226		11	pCi/L		109	70	130			
Radium 226 precision (±)		2.1	pCi/L							
Radium 226 MDC		0.28	pCi/L							
Lab ID: MB-RA226-11368	3	Method Blank				Run: TENNELEC-3_240709A				07/22/24 10:34
Radium 226		0.003	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C24061049-001EDUP	3	Sample Duplicate				Run: TENNELEC-3_240709A				07/22/24 10:34
Radium 226		12	pCi/L					0.2	30	
Radium 226 precision (±)		2.2	pCi/L							
Radium 226 MDC		0.20	pCi/L							
- The RER result is 0.01.										

Qualifiers:

RL - Analyte Reporting Limit
ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories **Work Order:** C24060860 **Report Date:** 07/25/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-7425
Lab ID: LCS-228-RA226-11357	3	Laboratory Control Sample				Run: TENNELEC-4_240625A				07/02/24 12:38
Radium 228		12	pCi/L		112	70	130			
Radium 228 precision (±)		2.3	pCi/L							
Radium 228 MDC		0.95	pCi/L							
Lab ID: MB-RA226-11357	3	Method Blank				Run: TENNELEC-4_240625A				07/02/24 12:38
Radium 228		0.6	pCi/L							U
Radium 228 precision (±)		0.6	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C24060862-002AMS1	3	Sample Matrix Spike				Run: TENNELEC-4_240625A				07/02/24 12:38
Radium 228		12	pCi/L		100	70	130			
Radium 228 precision (±)		2.3	pCi/L							
Radium 228 MDC		0.96	pCi/L							
Lab ID: C24060862-002AMSD1	3	Sample Matrix Spike Duplicate				Run: TENNELEC-4_240625A				07/02/24 12:38
Radium 228		12	pCi/L		101	70	130	1.2	30	
Radium 228 precision (±)		2.3	pCi/L							
Radium 228 MDC		1.0	pCi/L							
- The RER result is 0.04.										
Method: RA-05										Batch: RA228-7433
Lab ID: LCS-228-RA226-11368	3	Laboratory Control Sample				Run: TENNELEC-4_240709B				07/17/24 13:53
Radium 228		9.7	pCi/L		94	70	130			
Radium 228 precision (±)		1.9	pCi/L							
Radium 228 MDC		0.73	pCi/L							
Lab ID: MB-RA226-11368	3	Method Blank				Run: TENNELEC-4_240709B				07/17/24 13:53
Radium 228		0.9	pCi/L							
Radium 228 precision (±)		0.5	pCi/L							
Radium 228 MDC		0.8	pCi/L							
Lab ID: C24061049-001EDUP	3	Sample Duplicate				Run: TENNELEC-4_240709B				07/17/24 13:53
Radium 228		0.66	pCi/L					150	30	UR
Radium 228 precision (±)		0.49	pCi/L							
Radium 228 MDC		0.75	pCi/L							
- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than or equal to the limit of 3, the RER result is 3.0.										

Qualifiers:

RL - Analyte Reporting Limit
R - Relative Percent Difference (RPD) exceeds advisory limit
ND - Not detected at the Reporting Limit (RL)
U - Not detected at Minimum Detectable Concentration (MDC)

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Work Order Receipt Checklist

Minnesota Valley Testing Laboratories C24060860

Login completed by: Aaron J. Smith
Reviewed by: lcadreau
Reviewed Date: 7/8/2024
Date Received: 6/24/2024
Received by: LFN
Carrier name: UPS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	26.0°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Trip Blanks and/or Blind Duplicate samples are assigned the earliest collection time for the associated requested analysis in order to evaluate the holding time unless specifically indicated.

Contact and Corrective Action Comments:

The temperature blank temperature in shipping container 1 was 24.8°C, shipping container 2 was 25.0°C, shipping container 3 was 26.0°C, shipping container 4 was 24.4°C, and shipping container 7 was 25.3°C. The temperature of the

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Work Order Receipt Checklist - Continued

Minnesota Valley Testing Laboratories C24060860

sample(s) in shipping container 5 was 25.3°C and shipping container 6 was 25.1°C. AS 6/24/24

Sample 52088002, MW 25 S for Radium 226 and 228 analysis was received at pH >2. Nitric acid (15 mL) was added in the laboratory to preserve to pH <2. In accordance with the method, these samples must held for 16 hours prior to analysis. AS 6/24/24

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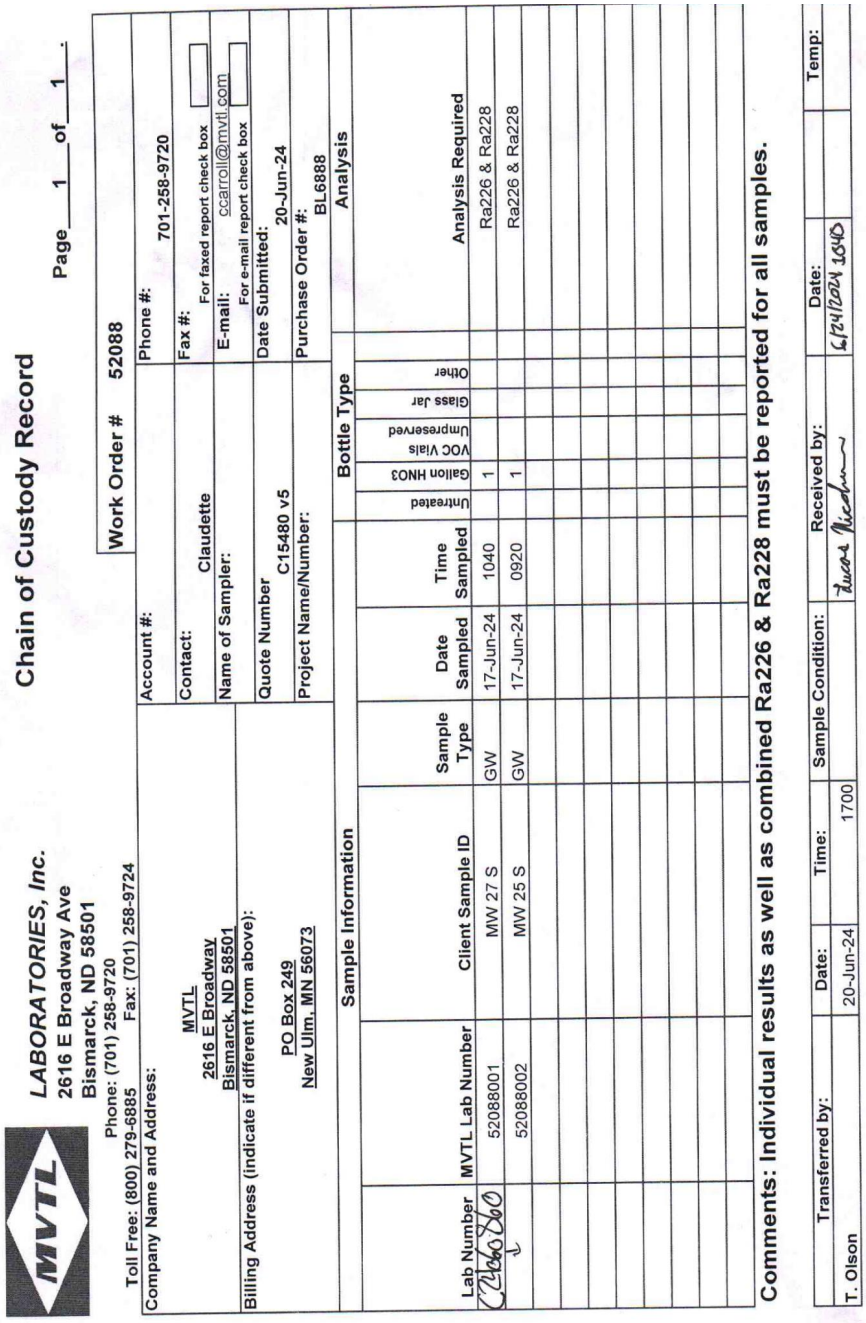
Account #: 2040 **Client:** Basin Electric Power Cooperative



Chain of Custody Record

Page 1 of 1

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2616 E Broadway Ave
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Work Order # 52088

Company Name and Address: MVTL, 2616 E Broadway, Bismarck, ND 58501
Account #:
Phone #: 701-258-9720
Contact: Claudette
Fax #: For faxed report check box
Name of Sampler:
E-mail: ccarroll@mvtl.com For e-mail report check box
Billing Address (indicate if different from above): PO Box 249, New Ulm, MN 56073
Quote Number C15480 v5
Date Submitted: 20-Jun-24
Project Name/Number:
Purchase Order #: BL6888

Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Unpreserved	Gallon HNO3	VOC Vials	Glass Jar	Other	Analysis Required
2406300	52088001	MW 27 S	GW	17-Jun-24	1040		1				Ra226 & Ra228
1	52088002	MW 25 S	GW	17-Jun-24	0920		1				Ra226 & Ra228

Comments: Individual results as well as combined Ra226 & Ra228 must be reported for all samples.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	20-Jun-24	1700		Lucas Nicolaus	6/24/2024 1040	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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Basin Electric Power Coop
WO: 52088

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted 6/18/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
—	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

Basin Electric North Dakota

Site Name: AVS LANDFILL
Event Date: 6-10-24
Weather Conditions: WARM & SUNNY
Field Technician: mls

River Elevation (if applicable)
1657.68

Well ID	Time	Depth to Water*	Well Condition	Comments
MW - 14S	745	204.00	Good	
MW - 15S		218.62		
MW - 20S		219.80		
MW - 16S		235.74		
MW - 17S		238.05		
MW - 19S		148.83		
MW - 18S		198.56		
MW - 22S		209.73		
MW - 26S		190.21		
MW - 24S		206.46		
MW - 21S		202.30		
MW - 25S		198.23		
MW - 27S		217.80		

* Depth to water as measured from the top of PVC casing.

Well/Piezo ID: MW-155

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: warm 60° Collector(s) MK / MK

Date: 6-11-24
Time: Start 0808
Finish 1012

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 38/22 @ max psi = 70 ml

b. Water Table Depth 218.62 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
						<0.5	<5		
0941	INITIAL 4L	12.1	8.01	2991	59.6	.63	1.48	Brown	224.09
0945	4.25 L	12.1	8.05	2990	60.1	.62	1.41	↓	224.95
0949	4.35 L	12.0	8.05	2976	61.5	.60	1.53		225.20
0953	4.75 L	12.2	8.0	2974	62.0	.59	1.36		225.35
0957	5.10 L	12.4	8.04	2986	63.0	.59	1.39	↓	225.41
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1000
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Eleff Date 6-11-24

Well/Piezo ID: MW-205

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny 70° Collector(s) dc ak

Date: 6-11-24
Time: Start ~~0950~~ 1020
Finish 1032

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting _____

b. Water Table Depth 219.80 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~ hydrosleeve

b. Field Testing Equipment Used:

	Make	Model	Serial Number
	YSI		5320084101
	HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
	INITIAL	13.0	8.27	773	83.5	4.75	16.8	yellow	219.80
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

<0.5 <5

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☐	☐	☑
Have parameters stabilized	☐	☐	☑

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1025
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Schaffer Date 6-11-24

Well/Piezo ID: MW-16S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Warm 70° Collector(s) MLS

Date: 6/11/24
Time: Start 1037
Finish ~~0930~~ 0935

6-12-24

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 30/30 @ MAX PSI ~50ML

b. Water Table Depth 235.74 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L <0.5 +/- 10%	Turbidity (NTU) <5 +/- 10%	Color	DTW 0.33 ft
1124	INITIAL 2L	15.0	7.91	2291	4.8	1.03	3.93	Brown	239.41
1129	2.4 L	14.8	8.09	2201	22.0	.88	4.06	|	240.06
1134	2.8 L	14.6	8.12	2165	26.9	.76	4.94	|	240.25
1139	3 L	14.8	8.12	2165	32.3	.69	4.96	|	240.49
1144	3.4 L	15.0	8.15	2083	41.9	.61	4.00	|	240.75
1149	4 L	14.9	8.17	2019	48.5	.60	4.09	|	241.22
1154	4.5 L	14.9	8.18	1985	53.7	.61	4.16	|	241.64
1159	4.9 L	14.8	8.20	1937	57.1	.63	4.24	↓	241.99
	L								
	5.25 L	pumped down to 245ft							245.0 @ 0845
	L								
	L	15.2	9.0	1481	103.5	3.47	3.94	Brown	~~243~~.54 6/12/24 @ ~~0845~~ ~~0850~~
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☒	☐
Have parameters stabilized	☐	☒	☐

If no or N/A - Explain below.

246.21 when done

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	~~0845~~ 6/12/24
	~~250ML~~	~~1~~		~~ANIONS~~	0935
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Schettle Date 6/12/24

Well/Piezo ID: MW-[redacted]17S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: 75. Breezy Sunny
Collector(s): MK MLS
Date: 6/11/24
Time: Start 1228
Finish ~~0900~~ 1010

6-12-24

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 270
b. Water Table Depth 238.05
c. Casing Material PVC
d. Casing Diameter _____
Pump Setting 37/23 @ max psi ~100ml

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L +/- 10% (<0.5)	Turbidity (NTU) +/- 10% (<5)	Color	DTW 0.33 ft
1320	INITIAL 5L	12.9	8.02	2760	-0.8	1.11	4.76	Brown	246.00
1325	5.25 L	13.2	8.03	2753	19.5	.93	4.69		246.86
1330	5.5 L	12.9	8.01	2734	26.2	.78	4.50		247.55
1335	6 L	12.9	7.99	2737	39.1	.85	4.99		248.35
1340	6.5 L	12.8	7.98	2721	17.5	1.22	4.50		249.21
	L								
	L								
	L		pumped down to			251.1			
	L								
	L								
	L	13.2	7.91	2569	122.1	3.3	4.0	Brown	~~247.48~~
	L								
	L								
	L								247.36

6/12/24 @ 1010

6-12-24

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☒	☐
Have parameters stabilized	☐	☒	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1010
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

6-12-24

Comments _____

Signature [signature] Date 6/12/24

Well/Piezo ID: MW-19S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: 75 Sunny Breezy
Collector(s) MK MLS

Date: 6/12/24
Time: Start 1025
Finish 1106

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length ______
c. Casing Material PVC
Pump Setting 19/11 @ max PSI ~110mL

b. Water Table Depth 148.83
d. Casing Diameter ______

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	✓ DO mg/L <0.5	✓ Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
1051	INITIAL 5	10.6	8.05	3105	35.1	.30	2.98	clear	149.10
1056	5.5 L	10.4	8.05	3105	38.0	.29	3.68	↓	149.11
1101	6 L	10.3	8.06	3107	37.4	.28	1.99	↓	149.14
1106	6.5 L	10.2	8.06	3103	35.7	.24	2.08	↓	149.14
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

DUP.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1106
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments

Signature [signature]

Date 6/12/24

Well/Piezo ID: MW-18S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Collector(s)

Date: 6-12-24
Time: Start 1210
Finish 1319

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ ☐

a. Total Well Length
b. Water Table Depth 198.56
c. Casing Material PVC
d. Casing Diameter

Pump Setting 11/19 @ max PSI ~140ML

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L <0.5	Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
1304	INITIAL 0	12.3	9.52	2558	60.0	.34	4.79	yellow	199.36
1309	7 L	12.2	9.47	2579	61.4	.31	4.48	↓	199.20
1314	8 L	12.2	9.42	2585	60.1	.32	4.74		199.39
1319	9 L	12.0	9.37	2608	54.2	.32	4.57		199.31
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1319
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments

Signature Myla Schuetz Date 10/12/24

Well/Piezo ID: MW-22S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: warm 65° Collector(s) mk

Date: 6/13/24
Time: Start 0820
Finish 0920

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 41/17 @ max PSI ~ 60mls

b. Water Table Depth 209.73 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L <0.5 +/- 10%	Turbidity (NTU) <5 +/- 10%	Color	DTW 0.33 ft
0855	INITIAL 4.5	10.8	8.18	2438	1.6	.47	6.74	yellow	210.1
0858	5 L	10.7	8.18	2411	1.0	.45	6.99	Brown	210.1
0901	5.5 L	10.8	8.18	2436	-0.3	.42	7.14	↓	210.1
0904	6 L	10.8	8.17	2433	-1.7	.39	6.20		210.2
0907	6.5 L	11.7	8.18	2427	-2.7	.42	5.94		210.21
0910	7 L	11.6	8.18	2440	-2.7	.40	5.53		210.0
0913	7.5 L	11.5	8.18	2450	-2.5	.43	5.39	↓	209.98
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	0913
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Mike Schott Date 6-13-24

Well/Piezo ID: MW 26S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Warm 70° Collector(s) MS AK

Date: 6.13.24
Time: Start 0955
Finish 1093

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 248
b. Water Table Depth 190.21
c. Casing Material PVC
d. Casing Diameter

Pump Setting 39/21 ~ 150mL @ max PSI
38/22 ~ 175mL

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L (<0.5) +/- 10%	Turbidity (NTU) (<5) +/- 10%	Color	DTW 0.33 ft
1004	INITIAL						D	Brown	193.30 – first pump
1006	L								193.1
1013	L						102	Mud	193.26
1040	5.5 L	11.4	8.15	2667	-35.8	.30	38.2		193.0
1043	6.5 L	11.2	8.15	2668	-38.1	.31	37.8		193.0 –
1046	7 L	10.9	8.15	2673	-40.7	.32	31.7		192.85
1049	7.5 L	11	8.15	2681	-41.1	.33	29.6		193.04
1052	8 L	11.1	8.15	2665	-41.6	.33	28.7		192.83 –
1055	8.5 L	10.9	8.15	2665	-43.2	.35	27.9		193.1 – during sampling
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	~~1055~~
	1gal	1		Radium	1052

Comments

Signature Myles Schultz Date 6/13/24

Well/Piezo ID: MW-24S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny Breezy 70 Collector(s) MK MW

Date: 6/13/24
Time: Start 1115
Finish 1212

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 6/14 @ max psi ~100mL

b. Water Table Depth 206.46 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO ✓ mg/L (<0.5) +/- 10%	Turbidity (NTU) (<5) +/- 10%	Color	DTW 0.33 ft
1155	INITIAL 4.5 L	10	8.12	2994	19.	.32	8.45	yellow	208.0
1158	5 L	10	8.12	2998	20.7	.29	8.26	brown	208
1201	5.5 L	10	8.12	2999	22.7	.35	8.58	↓	208.02
1203	6 L	10.1	8.13	3006	23.8	.54	8.74	↓	208.1
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

DUP.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1203
	~~250ML~~	~~1~~		~~ANIONS~~	↓
	500ML	1	HNO3	METALS	

Comments _____

Signature Myla Schuett Date 6/13/24

Well/Piezo ID: MW.21S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny Breezy 70 Collector(s) MK MLS

Date: 6/13/24
Time: Start 1305
Finish 1449

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 38/22 c max PSI ~150mL

b. Water Table Depth 202.30 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO ✓ mg/L <0.5 +/- 10%	Turbidity ✓ (NTU) <5 +/- 10%	Color	DTW 0.33 ft
1342	INITIAL 5	12.3	8.00	3133	-89.0	.316	3.89	Brown	209.84
1346	5.25 L	12.5	7.99	3109	-80.7	.33	4.35		210.71
1350	5.5 L	13.2	7.93	3121	-67.2	.31	2.94		210.95
1354	10 L	14	7.96	2769	-44.9	.34	2.79		211.40
1358	6.25 L	14.1	7.94	2764	-35.1	.34	2.79		211.71
1400	6.5 L	14.2	7.94	2765	-26.0	.23	2.93		211.99
1404	6.75 L	14	7.94	3122	-16.7	.35	3.11		212.25
1408	7.0 L	14	7.96	3107	-10.8	.37	2.78		212.69
1412	7.25 L	14	7.96	3105	-3.5	.41	3.10		212.90
1416	7.5 L	14	7.95	2.108	1.9	.44	3.13		213.42
1420	8 L	14.1	7.96	3113	5.6	.44	2.79		213.74
1424	8.25 L	14.1	7.96	3117	11.4	.45	4.75		213.95
1428	8.5 L	14.1	7.97	3097	12.5	.32	3.73		214.25
1431	8.75 L	14.2	7.98	3106	13.2	.47	3.64	↓	214.54

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1431
	~~250ML~~	~~4~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	↓

Comments _____

Signature Myles Schettler Date 6/13/24

Well/Piezo ID: MW-25s

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Cloudy 63° Collector(s) MS/AK

Date: 6-17-24
Time: Start 0810
Finish 0920

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 213 c. Casing Material PVC Pump Setting

b. Water Table Depth 198.23 d. Casing Diameter

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L <0.5	Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
0909	INITIAL 6L	9.3	8.13	2883	141.2	.51	43	Brwn	199.18
0912	6.1L	9.3	8.16	2888	3	.51	44.6	↓	199.95
0915	6.3L	9.3	8.17	2891	.4	.50	41.7	↓	199.90
0918	6.5L	9.3	8.18	2889	-3	.49	39.7	↓	199.91
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

Dup.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	0920
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	
	1 gal	1		Radium	

Comments

Signature

Date 6-17-24

Well/Piezo ID: MW-27S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Cloudy 65° Collector(s) MH/HK

Date: 6-17-24
Time: Start 1010
Finish 1040

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting Hydrosleeve

b. Water Table Depth 217.80 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
						<0.5	<5		
1010	INITIAL	8.5	8.03	3016	123.4	3.45	570	Black	217.80
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1040
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	
	1GAL.	1	HNO3	Radium	

Comments _____

Signature _____ Date 6-17-24

Calibration Log YSI						Hach
Date/Time		pH	ORP	Conductivity	DO	Verify
4-15-24	0710	✓	✓	✓	✓	✓
5-13-24	1010	✓	✓	✓	✓	✓
5-14-24	0730	✓	✓	✓	✓	✓
5-21-24	0715	✓	✓	✓	✓	✓
5-22-24	0648	✓	✓	✓	✓	✓
6-1-24	0800	✓	✓	✓	✓	✓
6-12-24	0830	✓	✓	✓	✓	✓
6-13-24	0820	✓	✓	✓	✓	✓
6-17-24	0815	✓	✓	✓	✓	✓
6-25-24	0730	✓	✓	✓	✓	✓
8-1-24	0715	✓	✓	✓	✓	✓
8-16-24	0720	✓	✓	✓	✓	✓
9-10-24	0700	✓	✓	✓	✓	✓
9-11-24	0700	✓	✓	✓	✓	✓
9-17-24	0705	✓	✓	✓	✓	✓
10-1-24	0703	✓	✓	✓	✓	✓
10-2-24	0701	✓	✓	✓	✓	✓

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Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
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Basin Electric Power Coope
WO: 51646

Chain of Custody

Page __1___ of __1___

Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop. / Leland Olds Station / 3901 Highway 200A / Stanton, ND 58571	Account # 2040
Billing Address (indicate if different from above): Attn: Liabilities	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle
	Emails: mdihle@bepc.com aknutson@bepc.com
	Name of Sampler: Myles Shettler
	Ksolie@barr.com
	Quote Number
	Date Submitted: 6/13/2024
	Project Name/Number: AVS Landfill
	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW-15s	GW	6/11/2024	1000	2	N	B,Ca,Cl,F,SO4,TDS
002	MW-20s	GW	6/11/2024	1025	2	N	B,Ca,Cl,F,SO4,TDS
003	MW-16s	GW	6/12/2024	935	2	N	B,Ca,Cl,F,SO4,TDS
004	MW-17s	GW	6/12/2024	1010	2	N	B,Ca,Cl,F,SO4,TDS
005	MW-19s	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS
006	MW-18s	GW	6/12/2024	1319	2	N	B,Ca,Cl,F,SO4,TDS
007	AVS Leachate	SW	6/11/2024	1405	2	N	B,Ca,Cl,F,SO4,TDS
008	LOS Leachate	SW	6/12/2024	745	2	N	B,Ca,Cl,F,SO4,TDS
009	Duplicate	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS

Comments:

	Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
1.				[illegible]	13Jun24	1504	2.1C	(Y) / N	TN480
2.								Y / N	

Report Date: Wednesday, July 3, 2024 10:09:37 AM

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Basin Electric Power Coop
WO: 51753

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
Billing Address (indicate if different from above)	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
	Quote Number	Date Submitted 6/14/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	6/13/2024	1052	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 22 S	GW	6/13/2024	913	2	N	B, Ca, Cl, F, SO_4, TDS
003	MW 24 S	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
004	DUP	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
005	MW 21 S	GW	6/13/2024	1431	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/14/2024			14Jun24	14:51	4.5°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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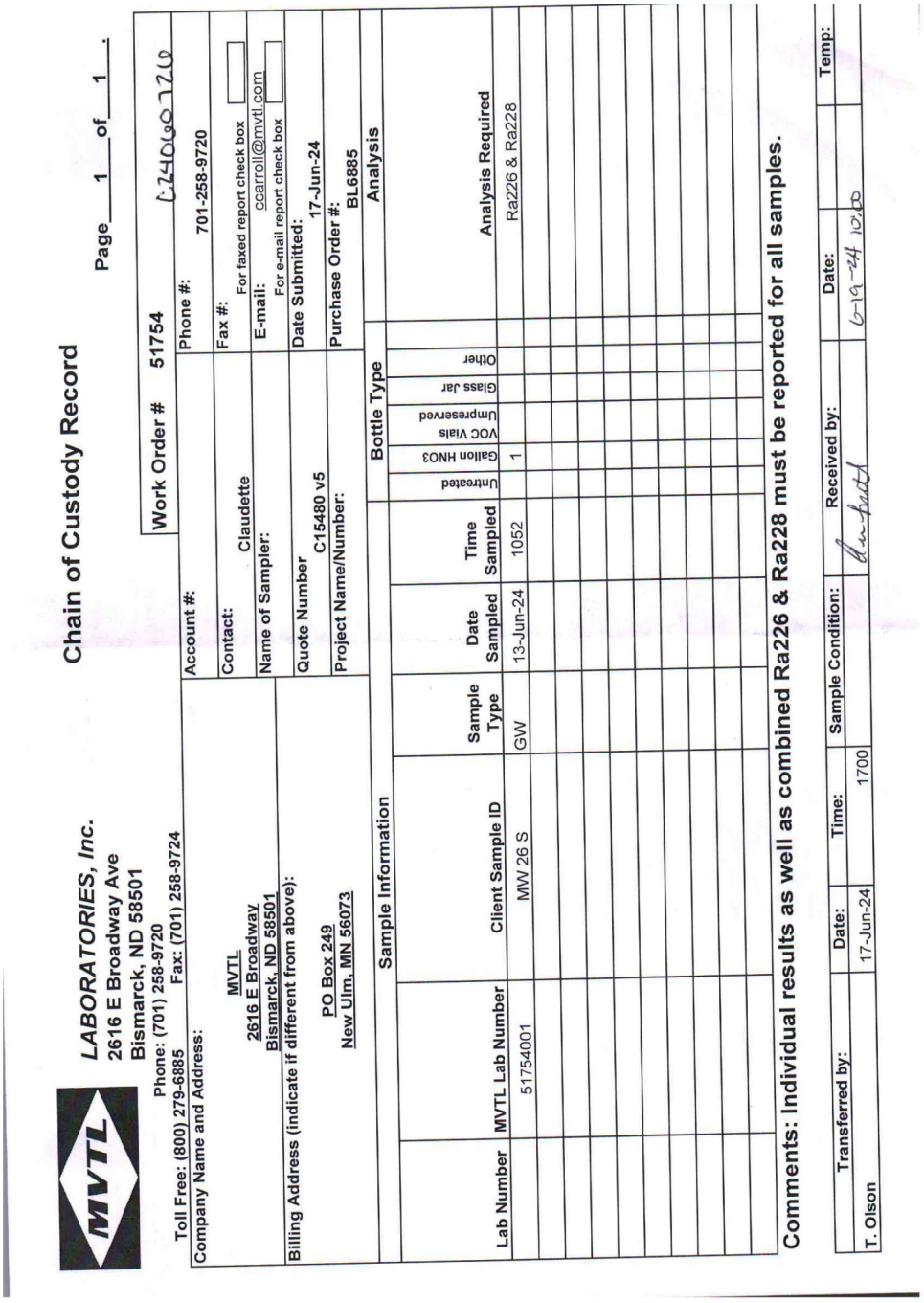
Account #: 2040 **Client:** Basin Electric Power Cooperative



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

Chain of Custody Record

Page 1 of 1

Work Order # 51754 C240690720

Company Name and Address: MVTL, 2616 E Broadway, Bismarck, ND 58501
Account #:
Contact: Claudette
Name of Sampler:
Phone #: 701-258-9720
Fax #: For faxed report check box
E-mail: ccarroll@mvtl.com For e-mail report check box
Date Submitted: 17-Jun-24
Quote Number C15480 v5
Project Name/Number:
Purchase Order #: BL6885

Billing Address (indicate if different from above): PO Box 249, New Ulm, MN 56073

Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Untreated	Gallon HNO3	VOC Vials Unpreserved	Glass Jar	Other	Analysis Required
	51754001	MW 26 S	GW	13-Jun-24	1052		1				Ra226 & Ra228

Comments: Individual results as well as combined Ra226 & Ra228 must be reported for all samples.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	17-Jun-24	1700		[signature]	6-19-24 1010	

Page 6 of 6

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Basin Electric Power Coop
WO: 52087

Chain of Custody

Page 1 of 1

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	**Account #** 2040	**Work Order #** Lab Use Only
Billing Address (indicate if different from above)	**Contact** Mark Dihle	**Phone #** 701-745-7238 701-557-5488
	Name of Sampler mls	**Emails** mdihle@bepc.com aknutson@bepc.com Ksolie@barr.com
	Quote Number	**Date Submitted** 6/18/2024
	Project Name/Number AVS CCR Wells	**Purchase Order #** 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coop
WO: 52088

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted 6/18/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
—	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CCR Wells (66660) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

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

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660001 **Date Collected:** 10/02/2024 11:50 **Matrix:** Groundwater
Sample ID: MW 26 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**41.0**	mg/L	5	1		10/09/2024 12:00	
Method: EPA 245.1							
Mercury	<0.0002	mg/L	0.0002	1	10/08/2024 11:51	10/09/2024 08:38	
Method: EPA 6010D							
Boron	**0.14**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:25	
Calcium	**3.51**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:02	
Lithium	**0.0483**	mg/L	0.02	1	10/04/2024 14:50	10/10/2024 09:41	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	10/04/2024 14:50	10/10/2024 17:23	
Arsenic	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:23	
Barium	**0.0514**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:23	
Beryllium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:23	
Cadmium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:23	
Chromium	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:23	
Cobalt	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:23	
Lead	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:23	
Molybdenum	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:23	
Selenium	<0.005	mg/L	0.005	5	10/04/2024 14:50	10/10/2024 17:23	
Thallium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:23	
Method: SM4500-Cl-E 2011							
Chloride	**29.7**	mg/L	2.0	1		10/08/2024 12:40	
Method: SM4500-F-C-2011							
Fluoride	**1.33**	mg/L	0.1	1		10/04/2024 23:18	
Method: USGS I-1750-85							
Total Dissolved Solids	**1730**	mg/L	10	1		10/04/2024 14:10	

Report Date: Thursday, October 17, 2024 1:30:39 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660002 **Date Collected:** 10/02/2024 10:36 **Matrix:** Groundwater
Sample ID: MW 25 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**40.2**	mg/L	5	1		10/09/2024 12:09	
Method: EPA 245.1							
Mercury	<0.0002	mg/L	0.0002	1	10/08/2024 11:51	10/09/2024 08:38	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:25	
Calcium	**4.88**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:03	
Lithium	**0.0425**	mg/L	0.02	1	10/04/2024 14:50	10/10/2024 09:42	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	10/04/2024 14:50	10/10/2024 17:28	
Arsenic	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:28	
Barium	**0.1306**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:28	
Beryllium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:28	
Cadmium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:28	
Chromium	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:28	
Cobalt	<0.002	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:28	
Lead	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:28	
Molybdenum	**0.0020**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:28	
Selenium	<0.005	mg/L	0.005	5	10/04/2024 14:50	10/10/2024 17:28	
Thallium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:28	
Method: SM4500-Cl-E 2011							
Chloride	**42.3**	mg/L	2.0	1		10/08/2024 12:41	
Method: SM4500-F-C-2011							
Fluoride	**1.30**	mg/L	0.1	1		10/04/2024 23:24	
Method: USGS I-1750-85							
Total Dissolved Solids	**1900**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660003 **Date Collected:** 10/02/2024 13:50 **Matrix:** Groundwater
Sample ID: MW 27 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**6.83**	mg/L	5	1		10/09/2024 12:10	
Method: EPA 245.1							
Mercury	<0.001	mg/L	0.001	5	10/08/2024 11:51	10/09/2024 08:38	
Method: EPA 6010D							
Boron	**0.40**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:26	
Calcium	**206**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:04	
Lithium	**0.201**	mg/L	0.02	1	10/04/2024 14:50	10/10/2024 09:43	
Method: EPA 6020B							
Antimony	<0.001	mg/L	0.001	5	10/04/2024 14:50	10/10/2024 17:32	
Arsenic	**0.0472**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:32	
Barium	**1.472**	mg/L	0.016	40	10/04/2024 14:50	10/11/2024 10:35	
Beryllium	**0.0082**	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:32	
Cadmium	**0.0036**	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:32	
Chromium	**0.5667**	mg/L	0.004	10	10/04/2024 14:50	10/11/2024 10:39	
Cobalt	**0.0932**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:32	
Lead	**0.1238**	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:32	
Molybdenum	**0.1332**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:32	
Selenium	**0.0088**	mg/L	0.005	5	10/04/2024 14:50	10/10/2024 17:32	
Thallium	**0.0011**	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:32	
Method: SM4500-Cl-E 2011							
Chloride	**62.0**	mg/L	2.0	1		10/08/2024 14:17	
Method: SM4500-F-C-2011							
Fluoride	**1.27**	mg/L	0.1	1		10/04/2024 23:30	
Method: USGS I-1750-85							
Total Dissolved Solids	**2160**	mg/L	10	1		10/04/2024 14:10	

Report Date: Thursday, October 17, 2024 1:30:39 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660004 **Date Collected:** 10/02/2024 09:33 **Matrix:** Groundwater
Sample ID: DUP **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**235**	mg/L	25	5		10/09/2024 11:51	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:27	
Calcium	**2.62**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:06	
Method: SM4500-Cl-E 2011							
Chloride	**12.1**	mg/L	2.0	1		10/08/2024 14:18	
Method: SM4500-F-C-2011							
Fluoride	**1.72**	mg/L	0.1	1		10/04/2024 23:36	
Method: USGS I-1750-85							
Total Dissolved Solids	**1610**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660005 **Date Collected:** 10/01/2024 09:46 **Matrix:** Groundwater
Sample ID: MW 15 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**412**	mg/L	25	5		10/09/2024 11:52	
Method: EPA 6010D							
Boron	**0.12**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:27	
Calcium	**3.80**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:07	
Method: SM4500-Cl-E 2011							
Chloride	**14.1**	mg/L	2.0	1		10/08/2024 14:19	
Method: SM4500-F-C-2011							
Fluoride	**1.30**	mg/L	0.1	1		10/04/2024 23:42	
Method: USGS I-1750-85							
Total Dissolved Solids	**1870**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660006 **Date Collected:** 10/01/2024 10:19 **Matrix:** Groundwater
Sample ID: MW 20 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**69.6**	mg/L	5	1		10/09/2024 12:04	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:28	
Calcium	**4.49**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:09	
Method: SM4500-Cl-E 2011							
Chloride	**25.8**	mg/L	2.0	1		10/08/2024 14:20	
Method: SM4500-F-C-2011							
Fluoride	**1.12**	mg/L	0.1	1		10/04/2024 23:48	
Method: USGS I-1750-85							
Total Dissolved Solids	**1720**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660007 **Date Collected:** 10/02/2024 08:09 **Matrix:** Groundwater
Sample ID: MW 16 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**131**	mg/L	5	1		10/09/2024 12:05	
Method: EPA 6010D							
Boron	**0.14**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:29	
Calcium	**2.22**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:11	
Method: SM4500-Cl-E 2011							
Chloride	**26.0**	mg/L	2.0	1		10/08/2024 14:21	
Method: SM4500-F-C-2011							
Fluoride	**2.16**	mg/L	0.1	1		10/05/2024 01:17	
Method: USGS I-1750-85							
Total Dissolved Solids	**1150**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660008 **Date Collected:** 10/02/2024 08:20 **Matrix:** Groundwater
Sample ID: MW 17 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**284**	mg/L	25	5		10/09/2024 11:55	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:29	
Calcium	**3.76**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:14	
Method: SM4500-Cl-E 2011							
Chloride	**13.6**	mg/L	2.0	1		10/08/2024 14:23	
Method: SM4500-F-C-2011							
Fluoride	**1.53**	mg/L	0.1	1		10/05/2024 01:23	
Method: USGS I-1750-85							
Total Dissolved Solids	**1720**	mg/L	10	1		10/04/2024 14:10	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660009 **Date Collected:** 10/02/2024 09:33 **Matrix:** Groundwater
Sample ID: MW 22 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**228**	mg/L	25	5		10/09/2024 11:56	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:30	
Calcium	**2.59**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:18	
Method: SM4500-Cl-E 2011							
Chloride	**12.3**	mg/L	2.0	1		10/08/2024 14:24	
Method: SM4500-F-C-2011							
Fluoride	**1.59**	mg/L	0.1	1		10/05/2024 01:29	*
Method: USGS I-1750-85							
Total Dissolved Solids	**1620**	mg/L	10	1		10/04/2024 14:10	

Analysis Results Comments

Fluoride

Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory fortified blank recovery was acceptable.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660010 **Date Collected:** 10/02/2024 12:48 **Matrix:** Groundwater
Sample ID: MW 24 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**64.7**	mg/L	5	1		10/09/2024 12:06	*
Method: EPA 6010D							
Boron	**0.11**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:34	
Calcium	**4.46**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:19	
Method: SM4500-Cl-E 2011							
Chloride	**50.0**	mg/L	2.0	1		10/08/2024 14:25	
Method: SM4500-F-C-2011							
Fluoride	**1.44**	mg/L	0.1	1		10/05/2024 01:35	
Method: USGS I-1750-85							
Total Dissolved Solids	**1980**	mg/L	10	1		10/04/2024 14:10	

Analysis Results Comments

Sulfate

Matrix spike and/or matrix spike duplicate recovery was low; the associated laboratory control sample recovery was acceptable.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66660011 **Date Collected:** 10/01/2024 14:05 **Matrix:** Groundwater
Sample ID: LEACHATE POND **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**965**	mg/L	25	5		10/09/2024 12:16	
Method: EPA 353.2							
Nitrate + Nitrite as N	<1	mg/L	1	5		10/10/2024 11:48	
Method: EPA 6010D							
Boron	**0.71**	mg/L	0.1	1	10/04/2024 14:50	10/10/2024 16:34	
Calcium	**212**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:20	
Iron	**0.17**	mg/L	0.1	1	10/04/2024 14:50	10/15/2024 12:41	
Magnesium	**69.4**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:20	
Manganese	<0.05	mg/L	0.05	1	10/04/2024 14:50	10/15/2024 12:41	
Potassium	**17.9**	mg/L	1	1	10/04/2024 14:50	10/11/2024 13:20	
Method: EPA 6020B							
Arsenic	**0.0034**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:46	
Barium	**0.2382**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:46	
Cadmium	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:46	
Chromium	**0.0070**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:46	
Lead	<0.0005	mg/L	0.0005	5	10/04/2024 14:50	10/10/2024 17:46	
Molybdenum	**0.2374**	mg/L	0.002	5	10/04/2024 14:50	10/10/2024 17:46	
Selenium	<0.005	mg/L	0.005	5	10/04/2024 14:50	10/10/2024 17:46	
Method: SM2320 B-2011							
Alkalinity, Total	**100**	mg/L as CaCO3	20.5	1		10/04/2024 09:35	
Method: SM4500-Cl-E 2011							
Chloride	**42.9**	mg/L	2.0	1		10/08/2024 14:30	
Method: USGS I-1750-85							
Total Dissolved Solids	**1950**	mg/L	10	1		10/04/2024 14:10	
Method: USGS I-3765-85							
Total Suspended Solids	**9**	mg/L	2	1		10/04/2024 15:44	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QC Results Summary — WO #: 66660

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			100	102.0		85	115		
LFB			100	101.0		85	115		
LFB			100	94.1		85	115		
LFB			100	95.7		85	115		
LFB			100	97.0		85	115		
LFB			100	97.1		85	115		
LFB			100	98.0		85	115		
LFB			100	105.0		85	115		
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MS/MSD	65006018		500	104.0	97.6	85	115	2.1	20
MS/MSD	66487006		500	100.2	98.6	85	115	1.0	20
MS/MSD	66487014		5000	90.7	91.1	85	115	0.2	20
MS/MSD	66505005		100	89.3	89.7	85	115	0.4	20
MS/MSD	66660010		100	76.0	77.6	85	115	0.7	20
MS/MSD	66771004		1000	101.8	110.2	85	115	3.0	20
MS/MSD	66884003		100	89.0	90.4	85	115	0.8	20
MS/MSD	66956005		2000	74.0	76.8	85	115	1.3	20

Nitrate + Nitrite as N — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			0.5	94.0		90	110		
LFB			0.5	92.0		90	110		
LFB			0.5	96.0		90	110		

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Nitrate + Nitrite as N Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			0.5	94.0		90	110		
LFB			0.5	94.0		90	110		
MS/MSD	66884003		1	97.0	93.0	90	110	2.6	20
MS/MSD	66948001		5	102.0	110.0	90	110	2.4	20
MS/MSD	67113001		1	87.0	87.0	90	110	0.0	20
MS/MSD	67290004		1	92.0	93.0	90	110	1.1	20

Chloride Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	97.2		90	110		
LFB			30	97.7		90	110		
LFB			30	98.1		90	110		
LFB			30	98.2		90	110		
LFB			30	98.5		90	110		
LFB			30	103.0		90	110		
LFB			30	102.0		90	110		
LFB			30	103.0		90	110		
LFB			30	100.0		90	110		
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MS/MSD	66272008		3000	123.6	130.6	80	120	1.6	20
MS/MSD	66487006		1200	112.8	115.3	80	120	0.7	20
MS/MSD	66528001		30	103.9	101.1	80	120	0.0	20
MS/MSD	66803001		30	99.7	100.0	80	120	0.0	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Boron — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	102.0		85	115		
MB		<0.1							
PDS/PDSD	65283001		2	82.4	81.8	75	125	0.2	20
PDS/PDSD	65673005		20	93.3	82.1	75	125	4.3	20
PDS/PDSD	66660009		0.4	94.4	94.1	75	125	0.2	20
MS/MSD	66660011		0.4	91.2	88.9	70	130	0.8	20

Calcium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	107.0		85	115		
MB		<1							
PDS/PDSD	65295002		100	105.0	106.0	75	125	0.5	20
PDS/PDSD	66075001		100	91.4	89.2	75	125	1.1	20
PDS/PDSD	66272007		2000	97.7	98.4	75	125	0.5	20
PDS/PDSD	66281001		100	87.8	98.7	75	125	4.8	20
PDS/PDSD	66487006		500	96.8	92.6	75	125	1.4	20
PDS/PDSD	66505001		100	90.4	91.8	75	125	0.6	20
DUP	66660005							3.6	20
PDS/PDSD	66660007		100	101.0	103.0	75	125	1.3	20
PDS/PDSD	66771003		100	88.7	93.4	75	125	2.9	20
PDS/PDSD	66878001		100	98.6	101.0	75	125	2.0	20

Iron — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	113.0		85	115		
MB		<0.1							
PDS/PDSD	66487019		2	83.1	88.0	75	125	0.7	20
MS/MSD	66660011		0.4	101.0	101.0	70	130	0.1	20
PDS/PDSD	66770009		0.4	102.0	102.0	75	125	0.4	20
PDS/PDSD	66956003		4	94.9	94.2	75	125	0.7	20
PDS/PDSD	67114001		2	94.1	96.3	75	125	0.8	20
PDS/PDSD	67353002		4	71.9	78.7	75	125	1.7	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Lithium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	108.0		85	115		
MB		<0.04							

Magnesium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	107.0		85	115		
MB		<1							
PDS/PDSD	65295002		100	105.0	106.0	75	125	0.8	20
PDS/PDSD	66075001		100	96.0	94.6	75	125	0.9	20
PDS/PDSD	66272007		2000	94.2	94.5	75	125	0.1	20
PDS/PDSD	66281001		100	95.7	103.0	75	125	4.5	20
PDS/PDSD	66487006		500	101.0	96.9	75	125	2.8	20
PDS/PDSD	66505001		100	97.3	98.0	75	125	0.5	20
DUP	66660005							5.3	20
PDS/PDSD	66660007		100	101.0	102.0	75	125	1.2	20
PDS/PDSD	66771003		100	93.0	96.6	75	125	2.7	20
PDS/PDSD	66878001		100	99.4	101.0	75	125	1.9	20

Manganese — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	106.0		85	115		
MB		<0.05							
PDS/PDSD	66487019		2	95.7	93.8	75	125	1.3	20
MS/MSD	66660011		0.4	93.8	94.0	70	130	0.2	20
PDS/PDSD	66770009		0.4	87.2	87.3	75	125	0.1	20
PDS/PDSD	66956003		4	92.0	90.8	75	125	1.0	20
PDS/PDSD	67114001		2	93.4	94.2	75	125	0.7	20
PDS/PDSD	67353002		4	83.9	87.6	75	125	1.9	20

Potassium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	106.0		85	115		
MB		<1							
PDS/PDSD	65295002		100	104.0	104.0	75	125	0.7	20

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Potassium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PDS/PDSD	66075001		100	99.6	99.0	75	125	0.6	20
PDS/PDSD	66272007		2000	104.0	104.0	75	125	0.5	20
PDS/PDSD	66281001		100	100.0	105.0	75	125	4.3	20
PDS/PDSD	66487006		500	105.0	101.0	75	125	3.9	20
PDS/PDSD	66505001		100	102.0	102.0	75	125	0.3	20
DUP	66660005							4.0	20
PDS/PDSD	66660007		100	101.0	102.0	75	125	1.1	20
PDS/PDSD	66771003		100	96.2	98.2	75	125	1.9	20
PDS/PDSD	66878001		100	98.1	101.0	75	125	2.9	20

Antimony				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	103.0		80	120		
LFB-MS			0.1	108.0		80	120		
MB		<0.001							
MB		<0.001							
SPK	66487019		0.1	110.0		75	125		
MS/MSD	66660011		0.4	105.0	108.0	75	125	3.3	20

Arsenic				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	106.0		80	120		
LFB-MS			0.1	102.0		80	120		
MB		<0.002							
MB		<0.002							
SPK	66487019		0.1	104.0		75	125		
MS/MSD	66660011		0.4	102.0	106.0	75	125	3.3	20

Barium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	108.0		80	120		
LFB-MS			0.1	105.0		80	120		
MB		<0.002							
MB		<0.002							

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Barium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	66660011		0.4	103.0	104.0	75	125	0.5	20

Beryllium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	97.5		80	120		
LFB-MS			0.1	104.0		80	120		
MB		<0.0005							
MB		<0.0005							
MS/MSD	66487019		0.4	54.6	58.0	75	125	6.2	20
SPK	66487019		0.1	121.0		75	125		
MS/MSD	66660011		0.4	106.0	107.0	75	125	1.4	20

Cadmium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	106.0		80	120		
LFB-MS			0.1	102.0		80	120		
MB		<0.0005							
MB		<0.0005							
SPK	66487019		0.1	98.9		75	125		
MS/MSD	66660011		0.4	99.4	101.0	75	125	2.0	20

Chromium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	109.0		80	120		
LFB-MS			0.1	103.0		80	120		
MB		<0.002							
MB		<0.002							
SPK	66487019		0.1	106.0		75	125		
MS/MSD	66660011		0.4	99.5	103.0	75	125	3.2	20

Cobalt				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	102.0		80	120		
LFB-MS			0.1	109.0		80	120		
MB		<0.002							
MB		<0.002							

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Cobalt — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
SPK	66487019		0.1	105.0		75	125		
MS/MSD	66660011		0.4	99.0	102.0	75	125	2.7	20

Lead — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	108.0		80	120		
LFB-MS			0.1	102.0		80	120		
MB		<0.0005							
MB		<0.0005							
SPK	66487019		0.1	96.0		75	125		
MS/MSD	66660011		0.4	99.2	100.0	75	125	1.0	20

Molybdenum — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	113.0		80	120		
LFB-MS			0.1	110.0		80	120		
MB		<0.002							
MB		<0.002							
MS/MSD	66487019		0.4	43.6	47.1	75	125	7.2	20
SPK	66487019		0.1	108.0		75	125		
MS/MSD	66660011		0.4	95.3	101.0	75	125	3.8	20

Selenium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	103.0		80	120		
LFB-MS			0.1	106.0		80	120		
MB		<0.005							
MB		<0.005							
MS/MSD	66487019		0.4	49.2	47.7	75	125	3.1	20
SPK	66487019		0.1	105.0		75	125		
MS/MSD	66660011		0.4	104.0	110.0	75	125	5.9	20

Thallium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MS			0.1	102.0		80	120		
LFB-MS			0.1	109.0		80	120		

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Thallium Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MB		<0.0005							
MB		<0.0005							
MS/MSD	66487019		0.4	46.2	50.1	75	125	7.8	20
SPK	66487019		0.1	95.7		75	125		
MS/MSD	66660011		0.4	95.8	97.4	75	125	1.8	20

Mercury Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			0.002	99.0		85	115		
LFB			0.002	101.0		85	115		
LFB			0.002	96.3		85	115		
LRB		<0.0002							
MB		<0.0002							
MB		<0.0002							
PDS/PDSD	66272010		0.01	113.0	114.0	70	130	0.9	
MS/MSD	66474001		0.002	88.8	93.4	70	130	5.4	20
MS/MSD	66487007		0.002	93.2	92.8	70	130	5.4	20
MS/MSD	66487017		0.002	96.8	99.0	70	130	5.1	20
MS/MSD	66505005		0.002	96.7	95.2	70	130	0.0	20
MS/MSD	66770008		0.002	94.6	95.0	70	130	0.0	20
MS/MSD	66801001		0.002	91.6	90.3	70	130	0.0	20

Alkalinity, Total Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			501	92.3		80	120		
LFB			410	93.1		90	110		
LFB			410	93.4		90	110		
LFB			410	93.2		90	110		
LFB			410	93.8		90	110		
MB		<20.5							
MB		<20.5							
MB		<20.5							
MB		<20.5							

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Alkalinity, Total — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
MS/MSD	66487001		410	89.7	89.6	80	120	0.2	20
MS/MSD	66487011		410	89.0	89.2	80	120	0.1	20
MS/MSD	66487015		410	91.5	90.8	80	120	0.4	20

Fluoride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-F			3.06	101.0		83.99	111.11		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	102.0		90	110		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	102.0		90	110		
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MB-F		<0.1							
MS/MSD	66487010		0.5	108.0	110.0	80	120	1.8	20
MS/MSD	66487014		0.5	64.0	58.0	80	120	3.5	20
MS/MSD	66660005		0.5	118.0	92.0	80	120	7.1	20
MS/MSD	66660009		0.5	90.0	126.0	80	120	8.5	20

Total Dissolved Solids — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			736	100.0		90.35	110.33		
CRM			736	101.0		90.35	110.33		
CRM			736	101.0		90.35	110.33		
CRM			736	100.0		90.35	110.33		
MB		<10							
DUP	66660011							0.5	20
DUP	66665001							0.7	20

Report Date: Thursday, October 17, 2024 1:30:39 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Total Suspended Solids Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			50	91.5		77.2	109.2		
MB		<2							
DUP	66662001							20.0	20

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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Basin Electric Power Coop
WO: 66660

Chain of Custody

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Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop., Leland Olds Station, 3901 Highway 200A, Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle	Emails: mdihle@bepc.com aknutson@bepc.com
Billing Address (indicate if different from above)	Name of Sampler: mk	Ksolie@barr.com
	Quote Number	Date Submitted: 10/3/2024
	Project Name/Number: AVS CCR Wells	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	10/2/2024	1150	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	10/2/2024	1036	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	MW 27 S	GW	10/2/2024	1350	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
004	DUP	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS
005	MW 15 S	GW	10/1/2024	946	2	N	B, Ca, Cl, F, SO_4, TDS
006	MW 20 S	GW	10/1/2024	1019	2	N	B, Ca, Cl, F, SO_4, TDS
007	MW 16 S	GW	10/2/2024	809	2	N	B, Ca, Cl, F, SO_4, TDS
008	MW 17 S	GW	10/2/2024	820	2	N	B, Ca, Cl, F, SO_4, TDS
009	MW 22 S	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024			10/4/24	1525	1.0°C	(Y) / N	TM959
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Lab Use Only

Chain of Custody

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Work Order # (Lab Use Only)

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	**Account #** 2040	**Phone #** 701-745-7238 701-557-5488
	Contact Mark Dihle	**Emails** mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mk	Ksolie@barr.com
Billing Address (indicate if different from above)	**Quote Number**	**Date Submitted** 10/3/2024
	Project Name/Number AVS CCR Wells	**Purchase Order #** 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
010	MW 24 S	GW	10/2/2024	1248	2	N	B, Ca, Cl, F, SO_4, TDS
011	LEACHATE POND	SW	10/1/2024	1405	2	N	As, Ba, B, Cd, Cr, Fe, Pb, Mn, Mo, Se, TSS, TDS, Total Alkalinity, Chloride, Nitrate, Nitrite, Sulfate, Ca, Mg, K,

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024						Y / N	
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS (66661) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

Certificate of Analysis

Approval

All data reported has been reviewed and approved by:

C. Carroll

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
SUBv	Energy Labs Casper	2393 Salt Creek Highway, Casper. WY 82601	307-235-0515	CERT

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66661001 **Date Collected:** 10/02/2024 11:50 **Matrix:** Groundwater
Sample ID: MW 26 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		11/01/2024 15:43	
Radium 228	See Attached			1		11/01/2024 15:43	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66661002 **Date Collected:** 10/02/2024 10:36 **Matrix:** Groundwater
Sample ID: MW 25 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		11/01/2024 15:43	
Radium 228	See Attached			1		11/01/2024 15:43	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 66661003 **Date Collected:** 10/02/2024 13:50 **Matrix:** Groundwater
Sample ID: MW 27 S **Date Received:** 10/03/2024 15:25 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: Contracted Result							
Radium 226	See Attached			1		11/01/2024 15:43	
Radium 228	See Attached			1		11/01/2024 15:43	

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ANALYTICAL SUMMARY REPORT

October 31, 2024

Minnesota Valley Testing Laboratories
1126 N Front St
New Ulm, MN 56073-1176

Work Order: C24100293 Quote ID: C15480
Project Name: 66661

Energy Laboratories, Inc. Casper WY received the following 3 samples for Minnesota Valley Testing Laboratories on 10/8/2024 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C24100293-001	66661001, MW 26 S	10/02/24 11:50	10/08/24	Groundwater	pH Check for Nitric Radiochem FIRST Radium 226 + Radium 228, Total Radium 226, Total Radium 228, Total
C24100293-002	66661002, MW 25 S	10/02/24 10:36	10/08/24	Groundwater	Same As Above
C24100293-003	66661003, MW 27 S	10/02/24 13:50	10/08/24	Groundwater	Radium 226 + Radium 228, Total Radium 226, Total Radium 228, Total

The analyses presented in this report were performed by Energy Laboratories, Inc., 2393 Salt Creek Hwy, Casper, WY 82601-9601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

Energy Laboratories, Inc. verifies the reported results for the analysis has been technically reviewed and approved for release.

If you have any questions regarding these test results, please contact your Project Manager.

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LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 66661
Lab ID: C24100293-001
Client Sample ID: 66661001, MW 26 S

Report Date: 10/31/24
Collection Date: 10/02/24 11:50
DateReceived: 10/08/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.1	pCi/L	U			E903.0	10/28/24 15:04 / apt
Radium 226 precision (±)	0.1	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 226 MDC	0.2	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 228	1.6	pCi/L				RA-05	10/21/24 12:01 / trs
Radium 228 precision (±)	0.9	pCi/L				RA-05	10/21/24 12:01 / trs
Radium 228 MDC	1.2	pCi/L				RA-05	10/21/24 12:01 / trs
Radium 226 + Radium 228	1.6	pCi/L				A7500-RA	10/29/24 12:14 / dmf
Radium 226 + Radium 228 precision (±)	0.9	pCi/L				A7500-RA	10/29/24 12:14 / dmf
Radium 226 + Radium 228 MDC	1.3	pCi/L				A7500-RA	10/29/24 12:14 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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LABORATORY ANALYTICAL REPORT
Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 66661
Lab ID: C24100293-002
Client Sample ID: 66661002, MW 25 S

Report Date: 10/31/24
Collection Date: 10/02/24 10:36
DateReceived: 10/08/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	0.08	pCi/L	U			E903.0	10/28/24 15:04 / apt
Radium 226 precision (±)	0.1	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 226 MDC	0.2	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 228	0.2	pCi/L	U			RA-05	10/21/24 12:01 / trs
Radium 228 precision (±)	0.8	pCi/L				RA-05	10/21/24 12:01 / trs
Radium 228 MDC	1.3	pCi/L				RA-05	10/21/24 12:01 / trs
Radium 226 + Radium 228	0.8	pCi/L	U			A7500-RA	10/29/24 12:14 / dmf
Radium 226 + Radium 228 precision (±)	0.8	pCi/L				A7500-RA	10/29/24 12:14 / dmf
Radium 226 + Radium 228 MDC	1.3	pCi/L				A7500-RA	10/29/24 12:14 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
U - Not detected
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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LABORATORY ANALYTICAL REPORT
Prepared by Casper, WY Branch

Client: Minnesota Valley Testing Laboratories
Project: 66661
Lab ID: C24100293-003
Client Sample ID: 66661003, MW 27 S

Report Date: 10/31/24
Collection Date: 10/02/24 13:50
DateReceived: 10/08/24
Matrix: Groundwater

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES, TOTAL							
Radium 226	5.7	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 226 precision (±)	5.3	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 226 MDC	4.3	pCi/L				E903.0	10/28/24 15:04 / apt
Radium 228	12.3	pCi/L				RA-05	10/29/24 13:02 / trs
Radium 228 precision (±)	5.7	pCi/L				RA-05	10/29/24 13:02 / trs
Radium 228 MDC	7.9	pCi/L				RA-05	10/29/24 13:02 / trs
Radium 226 + Radium 228	18.0	pCi/L				A7500-RA	10/30/24 15:13 / dmf
Radium 226 + Radium 228 precision (±)	7.8	pCi/L				A7500-RA	10/30/24 15:13 / dmf
Radium 226 + Radium 228 MDC	9.0	pCi/L				A7500-RA	10/30/24 15:13 / dmf

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

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QA/QC Summary Report

Prepared by Casper, WY Branch

Work Order: C24100293 **Report Date:** 10/30/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: RA226-11477
Lab ID: LCS-RA226-11477	3	Laboratory Control Sample				Run: TENNELEC-3_241015C				10/28/24 12:55
Radium 226		9.7	pCi/L		97	70	130			
Radium 226 precision (±)		1.9	pCi/L							
Radium 226 MDC		0.17	pCi/L							
Lab ID: MB-RA226-11477	3	Method Blank				Run: TENNELEC-3_241015C				10/28/24 12:55
Radium 226		0.09	pCi/L							U
Radium 226 precision (±)		0.1	pCi/L							
Radium 226 MDC		0.2	pCi/L							
Lab ID: C24091007-003GDUP	3	Sample Duplicate				Run: TENNELEC-3_241015C				10/28/24 12:55
Radium 226		0.059	pCi/L					110	30	UR
Radium 226 precision (±)		0.16	pCi/L							
Radium 226 MDC		0.26	pCi/L							
- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than or equal to the limit of 3, the RER result is 0.52.										
Lab ID: C24100239-001ADUP	3	Sample Duplicate				Run: TENNELEC-3_241015C				10/28/24 12:55
Radium 226		0.17	pCi/L					36	30	R
Radium 226 precision (±)		0.11	pCi/L							
Radium 226 MDC		0.15	pCi/L							
- Duplicate RPD is outside of the acceptance range for this analysis. However, the RER is less than or equal to the limit of 3, the RER result is 0.34.										

Qualifiers:

RL - Analyte Reporting Limit
R - Relative Percent Difference (RPD) exceeds advisory limit
ND - Not detected at the Reporting Limit (RL)
U - Not detected

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QA/QC Summary Report

Prepared by Casper, WY Branch

Work Order: C24100293 **Report Date:** 10/30/24

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05										Batch: RA228-7505
Lab ID: LCS-228-RA226-11477	3	Laboratory Control Sample				Run: TENNELEC-4_241015C				10/21/24 12:01
Radium 228		11	pCi/L		106	70	130			
Radium 228 precision (±)		2.2	pCi/L							
Radium 228 MDC		1.2	pCi/L							
Lab ID: MB-RA226-11477	3	Method Blank				Run: TENNELEC-4_241015C				10/21/24 12:01
Radium 228		2	pCi/L							
Radium 228 precision (±)		0.8	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C24091007-003GDUP	3	Sample Duplicate				Run: TENNELEC-4_241015C				10/21/24 13:35
Radium 228		2.0	pCi/L					12	30	
Radium 228 precision (±)		1.1	pCi/L							
Radium 228 MDC		1.6	pCi/L							
- The RER result is 0.14.										
Lab ID: C24100239-001ADUP	3	Sample Duplicate				Run: TENNELEC-4_241015C				10/21/24 12:01
Radium 228		1.9	pCi/L					26	30	
Radium 228 precision (±)		0.83	pCi/L							
Radium 228 MDC		1.1	pCi/L							
- The RER result is 0.38.										
Method: RA-05										Batch: RA228-7512
Lab ID: LCS-228-RA226-11488	3	Laboratory Control Sample				Run: TENNELEC-4_241023A				10/29/24 11:32
Radium 228		8.4	pCi/L		84	70	130			
Radium 228 precision (±)		1.8	pCi/L							
Radium 228 MDC		1.0	pCi/L							
Lab ID: MB-RA226-11488	3	Method Blank				Run: TENNELEC-4_241023A				10/29/24 11:32
Radium 228		1	pCi/L							
Radium 228 precision (±)		0.8	pCi/L							
Radium 228 MDC		1	pCi/L							
Lab ID: C24100293-003ADUP	3	Sample Duplicate				Run: TENNELEC-4_241023A				10/29/24 13:02
Radium 228		15	pCi/L					18	30	
Radium 228 precision (±)		6.1	pCi/L							
Radium 228 MDC		7.9	pCi/L							
- The RER result is 0.28.										

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

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Work Order Receipt Checklist

Minnesota Valley Testing Laboratories C24100293

Login completed by: Aaron J. Smith
Reviewed by: lcadreau
Reviewed Date: 10/14/2024
Date Received: 10/8/2024
Received by: CCS
Carrier name: UPS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	16.7°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☑	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Trip Blanks and/or Blind Duplicate samples are assigned the earliest collection time for the associated requested analysis in order to evaluate the holding time unless specifically indicated.

Contact and Corrective Action Comments:

The samples MW 26 S and MW 25 S for radionuclides analysis were received at pH >2. Nitric acid (15 mL) was added to preserve to pH <2. In accordance with the method, these samples must held for 16 hours prior to analysis. AJS

Work Order Receipt Checklist - Continued

Minnesota Valley Testing Laboratories C24100293

10/08/24

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Laboratory Certifications and Accreditations

Current certificates are available at www.energylab.com website:

	Agency	Number
Billings, MT	Alaska	17-023
	California	3087
	Colorado	MT00005
	Department of Defense (DoD)/ISO17025	ADE-2588
	Florida (Primary NELAP)	E87668
	Idaho	MT00005
	Louisiana	05079
	Montana	CERT0044
	Nebraska	NE-OS-13-04
	Nevada	NV-C24-00250
	North Dakota	R-007
	National Radon Proficiency	109383-RMP
	Oregon	4184
	South Dakota	ARSD 74:04:07
	Texas	TX-C24-00302
	US EPA Region VIII	Reciprocal
	USDA Soil Permit	P330-20-00170
	Washington	C1039
Casper, WY	Alaska	20-006
	California	3021
	Colorado	WY00002
	Florida (Primary NELAP)	E87641
	Idaho	WY00002
	Louisiana	05083
	Montana	CERT0002
	Nebraska	NE-OS-08-04
	Nevada	NV-C24-00245
	North Dakota	R-125
	Oregon	WY200001
	South Dakota	WY00002
	Texas	T104704181-23-21
	US EPA Region VIII	WY00002
	USNRC License	49-26846-01
	Washington	C1012
Gillette, WY	US EPA Region VIII	WY00006
Helena, MT	Colorado	MT00945
	Montana	CERT0079
	Nevada	NV-C24-00119
	US EPA Region VIII	Reciprocal
	USDA Soil Permit	P330-20-00090

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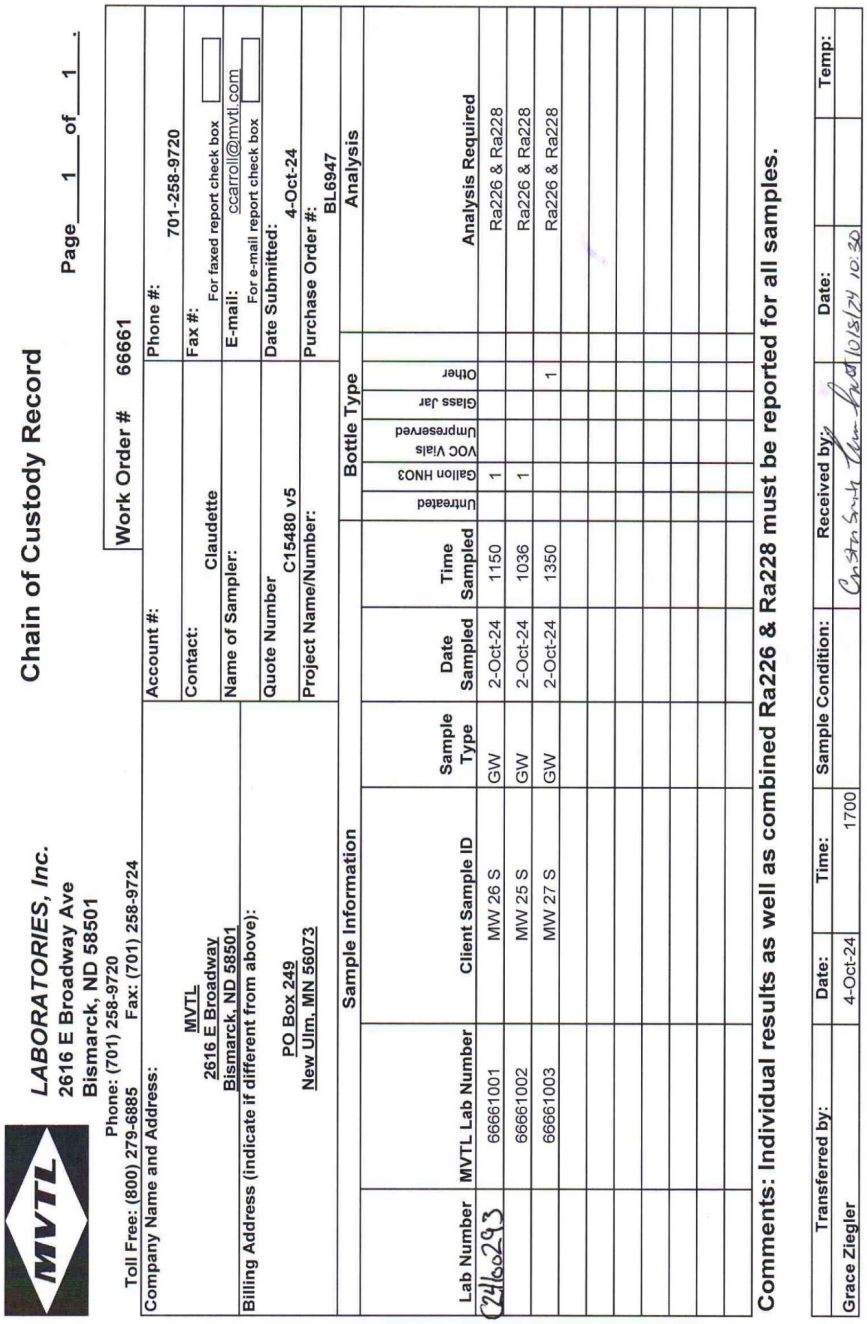

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Chain of Custody Record

Page 1 of 1

Work Order # 66661

Company Name and Address: MVTL, 2616 E Broadway, Bismarck, ND 58501
Account #:
Contact: Claudette
Name of Sampler:
Phone #: 701-258-9720
Fax #: For faxed report check box
E-mail: ccarroll@mvtl.com For e-mail report check box
Billing Address (indicate if different from above): PO Box 249, New Ulm, MN 56073
Quote Number C15480 v5
Project Name/Number:
Date Submitted: 4-Oct-24
Purchase Order #: BL6947

Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Untreated	Gallon HNO3	VOC Vials Unpreserved	Glass Jar	Other	Analysis Required
24l0293	66661001	MW 26 S	GW	2-Oct-24	1150		1				Ra226 & Ra228
	66661002	MW 25 S	GW	2-Oct-24	1036		1				Ra226 & Ra228
	66661003	MW 27 S	GW	2-Oct-24	1350				1		Ra226 & Ra228

Comments: Individual results as well as combined Ra226 & Ra228 must be reported for all samples.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
Grace Ziegler	4-Oct-24	1700		Christen Smith	10/5/24 10:30	

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Basin Electric Power Coope
WO: 66661

Chain of Custody

Page 1 of 2

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Accou... # 2040
Billing Address (indicate if different from above)	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle
	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mk
	Ksolie@barr.com
	Quote Number
	Date Submitted 10/3/2024
	Project Name/Number AVS CCR Wells
	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	10/2/2024	1150	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	10/2/2024	1036	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	MW 27 S	GW	10/2/2024	1350	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
	DUP	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS
	MW 15 S	GW	10/1/2024	946	2	N	B, Ca, Cl, F, SO_4, TDS
	MW 20 S	GW	10/1/2024	1019	2	N	B, Ca, Cl, F, SO_4, TDS
	MW 16 S	GW	10/2/2024	809	2	N	B, Ca, Cl, F, SO_4, TDS
	MW 17 S	GW	10/2/2024	820	2	N	B, Ca, Cl, F, SO_4, TDS
	MW 22 S	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024			100424	1525	1.0°C	Y / N	TM959
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
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Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Lab Use Only

Chain of Custody

Page 2 of 2

Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop., Leland Olds Station, 3901 Highway 200A, Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle	Emails: mdihle@bepc.com aknutson@bepc.com
	Name of Sampler: mk	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted: 10/3/2024
	Project Name/Number: AVS CCR Wells	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
	MW 24 S	GW	10/2/2024	1248	2	N	B, Ca, Cl, F, SO_4, TDS
	LEACHATE POND	SW	10/1/2024	1405	2	N	As, Ba, B, Cd, Cr, Fe, Pb, Mn, Mo, Se, TSS, TDS, Total Alkalinity, Chloride, Nitrate, Nitrite, Sulfate, Ca, Mg, K,

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024						Y / N	
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

Well/Piezo ID: MW-15S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS Landfill
Weather Conds: 40° calm
Date: 10-1-24
Time: 0817
Finish 1008
Collector(s) MK

WATER LEVEL DATA: (measured from Top of Casing) Well ☒

a. Total Well Length _____ c. Casing Material PVC Pump Settings 34/20 @ max PSI

b. Water Table Depth 218.96 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
0933	INITIAL 4L	10.1	.61	2776	8.07	92.8	1.80	Brown	224.50
0937	4.25 L	10.3	.65	2780	8.07	96.5	1.73	↓	224.81
0941	4.50 L	10.4	.62	2775	8.07	98.9	2.04		225.05
0945	4.75 L	10.4	.63	2780	8.07	100.5	2.26	↓	225.17
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	0940
	500mL	1	HNO3	Metals	↓

Comments _____

Signature _____ Date 10-1-24

Well/Piezo ID: MW-20S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS Landfill
Weather Conds: 40° Sunny calm
Collector(s): MK
Date: 10-1-24
Time: 1010
Finish 1030

WATER LEVEL DATA: (measured from Top of Casing) Well ☐

a. Total Well Length _____
b. Water Table Depth 220.11
c. Casing Material PVC
d. Casing Diameter _____ 2L
Pump Settings _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~ Hydrosieve

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
	INITIAL	9.1	3.25	2650	8.04	136.5	18.6	yellow	220.11
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

<0.5 <5

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1019
	500mL	1	HNO3	Metals	↓

Comments _____

Signature _____ Date 10-1-24

Well/Piezo ID: MW-16S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS Landfill
Weather Conds: Cool Breezy sunny
Date: 10-1-24
Time: 1033
Finish 0811 10-2-24
Collector(s)

WATER LEVEL DATA: (measured from Top of Casing) Well ☐

a. Total Well Length _____ c. Casing Material PVC Pump Settings 39/21 @ max PSI

b. Water Table Depth 235.95 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
1145	INITIAL 2L	14.9	1.47	2142	8.15	61.0	6.37	Brown	239.55
1149	2.2 L	14.7	1.15	2122	8.14	77.7	6.51		239.75
1152	2.4 L	14.9	1.08	2104	8.13	88.6	4.95		240.00
1156	2.6 L	14.8	1.00	2090	8.14	98.5	4.83		240.20
1200	2.8 L	14.8	0.96	2051	8.13	104.9	4.83		240.40
1204	3 L	14.8	0.92	2006	8.15	110.6	4.99		240.56
1208	3.2 L	14.8	0.89	1937	8.16	114.6	5.41	↓	240.89
	L	pumped down to 245ft							
	L								
0809	L	15.0	4.1	1920	8.2	120	4.8		243.13
	L							246.9 when done	
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☐	☑	☐
Have parameters stabilized	☐	☑	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	0809 10-2-24
	500mL	1	HNO3	Metals	↓

Comments

Signature [signature] Date 10.2.24

Well/Piezo ID: MW-17S

Ground Water Sample Collection Record

Client: BEPC Date: 10-1-24
Project No: Time: 1300
Site Location: AVS Landfill Finish 10-2-24
Weather Conds: windy, cool Collector(s) MK

WATER LEVEL DATA: (measured from Top of Casing) Well ☑

a. Total Well Length _____ c. Casing Material PVC Pump Settings 37/23 emax PSI

b. Water Table Depth 238.31 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
1334	INITIAL 5L	11.1	1.74	2570	8.02	6.6	5.51	BROWN	245.70
1338	7.5 L	11.2	1.23	2566	8.02	22.2	6.06		246.61
1342	10 L	11.1	1.00	2562	8.02	37.1	4.95		247.80
1346	12.5 L	11.0	0.91	2567	8.01	56.5	4.84		249.03
	L								
	L	pumped down to 250ft							
	L								
0820	L	11.5	3.40	2574	7.97	188.6	4.41	BROWN	244.31
	L								
	L								when done 247.0
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☐	☑	☐
Have parameters stabilized	☐	☑	☐

If no or N/A - Explain below.

DTW

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	0820 10-2-24
	500mL	1	HNO3	Metals	↓

Comments _____

Signature _____ Date 10-2-24

Well/Piezo ID: MW-22S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS Landfill
Weather Conds: sunny cool
Date: 10-2-24
Time: 0859
Finish 0947
Collector(s) MK MS

WATER LEVEL DATA: (measured from Top of Casing) Well ☑

a. Total Well Length _____
b. Water Table Depth 209.71
c. Casing Material PVC
d. Casing Diameter _____
Pump Settings 41/17 & max PSI

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
0925	INITIAL 5.5L	10.5	0.49	2448	8.18	-10.9	5.39	yellow/	210.55
0928	6 L	10.4	0.40	2448	8.18	-11.1	5.28	brown	210.56
0931	6.5 L	10.4	0.36	2444	8.19	-11.4	5.36	↓	210.40
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	0933
	500mL	1	HNO3	Metals	↓

Comments DUP

Signature _____ Date 10-2-24

Well/Piezo ID: MW-25S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS landfill
Weather Conds: Sunny cool
Date: 10-2-24
Time: 0950
Finish 1050
Collector(s) MK MLS

WATER LEVEL DATA: (measured from Top of Casing) Well ☑

a. Total Well Length _____ c. Casing Material PVC Pump Settings 40/14 @ max PSI 48/12

b. Water Table Depth 198.02 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
1023	INITIAL 6L	11.4	0.50	2869	8.23	-31.0	13.9	Brown	200.90
1026	6.5 L	10.9	0.53	2927	8.22	-34.2	14.2		200.95
1029	7 L	10.8	0.27	2909	8.21	-32.2	14.8		200.92
1032	7.5L	10.7	0.28	2923	8.2	-30.8	13.7		200.94
1035	8 L	10.6	0.27	2918	8.19	-34	14.3		200.90
	L								
	L								
	L								
	L								
	L								
	L								
	L								
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	L								

<0.5 <5

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1036
	500mL	1	HNO3	Metals	↓
	1gal	1	HNO3	Radium	↓

Comments _____

Signature _____ Date 10-2-24

Well/Piezo ID: MW-26S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS Landfill
Weather Conds: Windy, cool
Date: 10.2.24
Time: 1055
Finish 1212
Collector(s) MK MIS

WATER LEVEL DATA: (measured from Top of Casing) Well ☑

a. Total Well Length _____ c. Casing Material PVC Pump Settings 41/19 @ max PSI

b. Water Table Depth 190.41 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
			<0.5				<5		
1140	INITIAL 5.5	10.9	0.31	2093	8.17	-25.9	20.5	Brown	192.90
1143	6 L	11.0	0.29	2092	8.19	-30.5	20.5		193.1
1146	6.5 L	11.1	0.29	2076	8.17	-31.9	20.4		192.91
1149	7 L	11.2	0.28	2078	8.17	-32.3	19.7		192.81
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1150
	500mL	1	HNO3	Metals	↓
	1gal	1	HNO3	Radium	↓

Comments _____

Signature MK Date 10.2.24

Well/Piezo ID: MW-24S

Ground Water Sample Collection Record

Client: BEPC Date: 10-2-24
Project No: Time: 1218
Site Location: AVS Finish 1318
Weather Conds: windy & Cool Collector(s)

WATER LEVEL DATA: (measured from Top of Casing) Well ☑

a. Total Well Length ____ c. Casing Material PVC Pump Settings 10/14e MAX PSI

b. Water Table Depth 206.19 d. Casing Diameter ____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	DO mg/L +/- 10% (<0.5)	Spec. Cond (µs/cm) +/- 3%	pH +/- 0.1	ORP +/- 10%	Turbidity (NTU) +/- 10% (<5)	Color	DTW 0.33 ft
1238	INITIAL 5.5	9.4	.29	3019	8.13	12.7	8.09	yellow/	208.24
1241	6.5 L	9.6	.25	3019	8.12	18.5	7.92	Brown	208.20
1244	7.5 L	9.6	.26	3009	8.14	19.9	8.13	↓	208.16
1247	8.5 L	9.7	.23	2999	8.14	20.2	8.06	↓	208.18
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1248
	500mL	1	HNO3	Metals	↓

Comments

Signature [signature] Date 10-2-24

Well/Piezo ID: MW-27S

Ground Water Sample Collection Record

Client: BEPC Date: 10.2.24
Project No: Time: 1329
Site Location: AVS Finish 1415
Weather Conds: Sunny Breezy Collector(s) MK MNS

WATER LEVEL DATA: (measured from Top of Casing) Well ☐

a. Total Well Length _____ c. Casing Material PVC Pump Settings _____

b. Water Table Depth 209.81 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~ Hydrosleeve

b. Field Testing Equipment Used:

	Make	Model	Serial Number
	YSI		5320084101
	HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	DO mg/L	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
	INITIAL	11.5	1.72	3063	8.08	-116.9	N/A	BLACK	209.81
	L						TOO HIGH		
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

<0.5 <5

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1350
	500mL	1	HNO3	Metals	↓
	[redacted] 1L	1	HNO3	Radium	↓

Comments _____

Signature _____ Date 10.2.24

Calibration Log YSI						Hach
Date/Time		pH	ORP	Conductivity	DO	Verify
4-15-24	0710	✓	✓	✓	✓	✓
5-13-24	1010	✓	✓	✓	✓	✓
5-14-24	0730	✓	✓	✓	✓	✓
5-21-24	0715	✓	✓	✓	✓	✓
5-22-24	0648	✓	✓	✓	✓	✓
6-1-24	0800	✓	✓	✓	✓	✓
6-12-24	0830	✓	✓	✓	✓	✓
6-13-24	0820	✓	✓	✓	✓	✓
6-17-24	0815	✓	✓	✓	✓	✓
6-25-24	0730	✓	✓	✓	✓	✓
8-1-24	0715	✓	✓	✓	✓	✓
8-16-24	0720	✓	✓	✓	✓	✓
9-10-24	0700	✓	✓	✓	✓	✓
9-11-24	0700	✓	✓	✓	✓	✓
9-17-24	0705	✓	✓	✓	✓	✓
10-1-24	0703	✓	✓	✓	✓	✓
10-2-24	0701	✓	✓	✓	✓	✓

MINNESOTA VALLEY TESTING LABORATORIES, INC.
1126 North Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
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Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

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2616 East Broadway Avenue
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Basin Electric Power Coop
WO: 66660

Chain of Custody

Page 1 of 2

Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop., Leland Olds Station, 3901 Highway 200A, Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle	Emails: mdihle@bepc.com aknutson@bepc.com
Billing Address (indicate if different from above)	Name of Sampler: mk	Ksolie@barr.com
	Quote Number	Date Submitted: 10/3/2024
	Project Name/Number: AVS CCR Wells	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	10/2/2024	1150	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	10/2/2024	1036	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	MW 27 S	GW	10/2/2024	1350	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
004	DUP	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS
005	MW 15 S	GW	10/1/2024	946	2	N	B, Ca, Cl, F, SO_4, TDS
006	MW 20 S	GW	10/1/2024	1019	2	N	B, Ca, Cl, F, SO_4, TDS
007	MW 16 S	GW	10/2/2024	809	2	N	B, Ca, Cl, F, SO_4, TDS
008	MW 17 S	GW	10/2/2024	820	2	N	B, Ca, Cl, F, SO_4, TDS
009	MW 22 S	GW	10/2/2024	933	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024			10/4/24	1525	1.0°C	(Y) / N	TM959
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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

Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Lab Use Only

Chain of Custody

Page 2 of 2

Work Order # (Lab Use Only)

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	**Account #** 2040	**Phone #** 701-745-7238 701-557-5488
	Contact Mark Dihle	**Emails** mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mk	Ksolie@barr.com
Billing Address (indicate if different from above)	**Quote Number**	**Date Submitted** 10/3/2024
	Project Name/Number AVS CCR Wells	**Purchase Order #** 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
010	MW 24 S	GW	10/2/2024	1248	2	N	B, Ca, Cl, F, SO_4, TDS
011	LEACHATE POND	SW	10/1/2024	1405	2	N	As, Ba, B, Cd, Cr, Fe, Pb, Mn, Mo, Se, TSS, TDS, Total Alkalinity, Chloride, Nitrate, Nitrite, Sulfate, Ca, Mg, K,

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/3/2024						Y / N	
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Account #: 2040 **Client:** Basin Electric Power Cooperative
Workorder: AVS CRR Wells (67251) **PO:** 790708-01

Mark Dihle
Basin Electric Power Cooperative
1717 E. Interstate Avenue
Bismarck, ND 58503

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

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.

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 67251001 **Date Collected:** 10/08/2024 08:58 **Matrix:** Groundwater
Sample ID: MW-19s **Date Received:** 10/09/2024 14:37 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**763**	mg/L	25	5		10/16/2024 11:17	
Method: EPA 6010D							
Boron	**0.14**	mg/L	0.1	1	10/09/2024 16:19	10/10/2024 16:41	
Calcium	**4.39**	mg/L	1	1	10/09/2024 16:19	10/17/2024 09:38	
Method: SM4500-Cl-E 2011							
Chloride	**19.4**	mg/L	2.0	1		10/15/2024 09:38	
Method: SM4500-F-C-2011							
Fluoride	**0.67**	mg/L	0.1	1		10/09/2024 15:50	
Method: USGS I-1750-85							
Total Dissolved Solids	**2180**	mg/L	10	1		10/11/2024 14:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 67251002 **Date Collected:** 10/08/2024 10:27 **Matrix:** Groundwater
Sample ID: MW-18s **Date Received:** 10/09/2024 14:37 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**536**	mg/L	25	5		10/16/2024 11:27	
Method: EPA 6010D							
Boron	**0.10**	mg/L	0.1	1	10/09/2024 16:19	10/10/2024 16:42	
Calcium	**7.14**	mg/L	1	1	10/09/2024 16:19	10/17/2024 09:40	
Method: SM4500-Cl-E 2011							
Chloride	**8.9**	mg/L	2.0	1		10/15/2024 09:39	
Method: SM4500-F-C-2011							
Fluoride	**1.23**	mg/L	0.1	1		10/09/2024 15:58	
Method: USGS I-1750-85							
Total Dissolved Solids	**1770**	mg/L	10	1		10/11/2024 14:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 67251003 **Date Collected:** 10/08/2024 11:47 **Matrix:** Groundwater
Sample ID: MW-21s **Date Received:** 10/09/2024 14:37 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**458**	mg/L	25	5		10/16/2024 11:28	
Method: EPA 6010D							
Boron	**0.13**	mg/L	0.1	1	10/09/2024 16:19	10/10/2024 16:43	
Calcium	**4.78**	mg/L	1	1	10/09/2024 16:19	10/17/2024 09:41	
Method: SM4500-Cl-E 2011							
Chloride	**19.2**	mg/L	2.0	1		10/15/2024 09:40	
Method: SM4500-F-C-2011							
Fluoride	**1.51**	mg/L	0.1	1		10/09/2024 16:04	
Method: USGS I-1750-85							
Total Dissolved Solids	**1980**	mg/L	10	1		10/11/2024 14:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Analytical Results

Lab ID: 67251004 **Date Collected:** 10/08/2024 08:58 **Matrix:** Groundwater
Sample ID: DUPLICATE **Date Received:** 10/09/2024 14:37 **Collector:** Client

Temp @ Receipt (C): 1.0 **Received on Ice:** Yes

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Qual
Method: ASTM D516-16							
Sulfate	**762**	mg/L	25	5		10/16/2024 11:29	
Method: EPA 6010D							
Boron	**0.14**	mg/L	0.1	1	10/09/2024 16:19	10/10/2024 16:43	
Calcium	**4.35**	mg/L	1	1	10/09/2024 16:19	10/17/2024 09:42	
Method: SM4500-Cl-E 2011							
Chloride	**19.6**	mg/L	2.0	1		10/15/2024 09:42	
Method: SM4500-F-C-2011							
Fluoride	**0.64**	mg/L	0.1	1		10/09/2024 16:10	
Method: USGS I-1750-85							
Total Dissolved Solids	**2100**	mg/L	10	1		10/11/2024 14:20	

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Account #: 2040 **Client:** Basin Electric Power Cooperative

QC Results Summary — WO #: 67251

Sulfate — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			100	97.9		85	115		
LFB			100	100.0		85	115		
LFB			100	101.0		85	115		
LFB			100	97.9		85	115		
LFB			100	98.6		85	115		
LFB			100	95.3		85	115		
LFB			100	96.0		85	115		
LFB			100	104.0		85	115		
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MB		<5							
MS/MSD	67244001		1000	84.5	83.9	85	115	0.0	20
MS/MSD	67289003		500	105.9	109.6	85	115	1.5	20
MS/MSD	67312002		500	83.7	82.3	85	115	0.9	20
MS/MSD	67447003		500	80.9	81.1	85	115	0.2	20
MS/MSD	67467011		10000	88.1	92.1	85	115	2.0	20
MS/MSD	67472001		1000	101.7	91.1	85	115	3.8	20

Chloride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	97.8		90	110		
LFB			30	97.3		90	110		
LFB			30	97.6		90	110		
LFB			30	98.0		90	110		
LFB			30	97.9		90	110		

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Chloride — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB			30	97.9		90	110		
LFB			30	97.9		90	110		
LFB			30	98.2		90	110		
LFB			30	97.5		90	110		
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MB		<2.0							
MS/MSD	66884003		30	106.7	91.1	80	120	9.1	20
MS/MSD	67150001		30	104.8	100.6	80	120	0.8	20
MS/MSD	67289003		30	95.3	93.2	80	120	1.7	20
MS/MSD	67447003		30	102.6	93.5	80	120	7.2	20
MS/MSD	67467011		30	95.4	90.7	80	120	2.1	20

Boron — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-OE			0.4	101.0		85	115		
MB		<0.1							
PDS/PDSD	65283001		2	82.4	81.8	75	125	0.2	20
PDS/PDSD	65673005		20	93.3	82.1	75	125	4.3	20
PDS/PDSD	66660009		0.4	94.4	94.1	75	125	0.2	20
MS/MSD	67251004		0.4	122.0	124.0	70	130	1.0	20

Calcium — Units: mg/L

QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
LFB-MI			100	108.0		85	115		
MB		<1							
PDS/PDSD	65433006		100	96.1	96.0	75	125	0.0	20

Report Date: Friday, October 18, 2024 4:06:01 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

Calcium				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
PDS/PDSD	65702016		100	91.8	92.8	75	125	0.6	20
PDS/PDSD	65827002		100	101.0	101.0	75	125	0.0	20
DUP	67251001							0.9	20
PDS/PDSD	67289003		100	96.9	100.0	75	125	1.1	20
PDS/PDSD	67441001		100	102.0	104.0	75	125	1.7	20
PDS/PDSD	67441009		500	103.0	95.4	75	125	3.5	20
PDS/PDSD	67447003		100	101.0	102.0	75	125	0.4	20
PDS/PDSD	67467010		100	99.6	100.0	75	125	0.5	20
PDS/PDSD	67601001		100	98.3	101.0	75	125	1.7	20

Fluoride				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM-F			3.06	101.0		83.99	111.11		
LFB-F			0.5	100.0		90	110		
LFB-F			0.5	100.0		90	110		
MB-F		<0.1							
MB-F		<0.1							
MS/MSD	67105001		0.5	102.0	104.0	80	120	1.9	20

Total Dissolved Solids				Units: mg/L					
QC Type	Original Sample ID	Blank Result	Spike Amount	Spike % Recovery	Spike Duplicate % Recovery	Lower Control Limit (%)	Upper Control Limit (%)	RPD (%)	RPD Limit (%)
CRM			736	99.0		90.35	110.33		
CRM			736	98.0		90.35	110.33		
MB		<10							
MB		<10							
DUP	67251001							9.6	20
DUP	67467013							0.0	20

Report Date: Friday, October 18, 2024 4:06:01 PM

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Account #: 2040 **Client:** Basin Electric Power Cooperative

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Basin Electric Power Coope
WO: 67251

Chain of Custody

Page 1 of 1

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted 10/9/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Work Order #
Lab Use Only

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW - 19 S	GW	10/8/2024	858	2	N	B, Ca, Cl, F, SO_4, TDS
002	MW - 18 S	GW	10/8/2024	1027	2	N	B, Ca, Cl, F, SO_4, TDS
003	MW - 21 S	GW	10/8/2024	1147	2	N	B, Ca, Cl, F, SO_4, TDS
004	DUPLICATE	GW	10/8/2024	858	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/9/2024			10/9/24	1457	1.0°C	Y / N	TM959
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

Well/Piezo ID: MW-195

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: 46° cool calm
Collector(s): MS

Date: 10-8-24
Time: 0810
Finish 0920

WATER LEVEL DATA: (measured from Top of Casing) Well ☒

a. Total Well Length _____
b. Water Table Depth 149.44
c. Casing Material PVC
d. Casing Diameter _____

Pump Settings 20/10 @ Max psi

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
0840	INITIAL 5.5L	9.1	.43	3127	8.04	53.9	1.48	clear	149.71
0844	6 L	9.1	.42	3136	8.04	51.7	1.37	↓	149.69
0847	6.5 L	9.1	.40	3141	8.04	50.4	1.43	↓	149.75
0850	7 L	9.1	.40	3150	8.04	48.1	1.58	↓	149.70
0854	7.5 L	9.0	.41	3154	8.03	46.0	1.36	↓	149.66
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

Dup.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	0858
	500mL	1	HNO3	Metals	

Comments _____

Signature Myles Schaffer

Date 10-8-24

Well/Piezo ID: MW-18S

Ground Water Sample Collection Record

ent: BEPC
Project No:
Site Location: AVS
Weather Conds: cool, calm 50° Collector(s) MS

Date: 10-8-24
Time: 0930
Finish 1040

WATER LEVEL DATA: (measured from Top of Casing) Well ☒

a. Total Well Length _____ c. Casing Material PVC Pump Settings 43/17 @ 20MX PSI

b. Water Table Depth 199.09 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	DO mg/L +/- 10% (<0.5)	Spec. Cond (µs/cm) +/- 3%	pH +/- 0.1	ORP +/- 10%	Turbidity (NTU) +/- 10% (<5)	Color	DTW 0.33 ft
1010	INITIAL 7L	11.5	.64	2678	9.38	75.5	4.55	yellow	199.67
1014	7.5 L	11.5	.63	2680	9.33	74.8	4.21	↓	199.65
1017	8 L	11.4	.61	2687	9.33	73.4	4.18		199.59
1020	8.5 L	11.5	.59	2684	9.32	73.5	3.96		199.64
1024	9 L	11.6	.59	2688	9.31	68.8	3.68	↓	199.62
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1027
	500mL	1	HNO3	Metals	

Comments _____

Signature Myles Schelle Date 10-8-24

Well/Piezo ID: MW-21S

Ground Water Sample Collection Record

ent: BEPC
Project No:
Site Location: AVS
Weather Conds: Cool & calm Collector(s) MS

Date: 10-8-24
Time: 1055
Finish 1159

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒

a. Total Well Length _____ c. Casing Material PVC

Pump Settings 38/22 @ Max psi

b. Water Table Depth 202.70 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	DO mg/L (<0.5)	Spec. Cond (µs/cm)	pH	ORP	Turbidity (NTU) (<5)	Color	DTW
Stabilization		+/- 0.2	+/- 10%	+/- 3%	+/- 0.1	+/- 10%	+/- 10%		0.33 ft
1126	INITIAL 6.5	12.3	.37	3098	7.92	26.2	1.91	Brown	213.90
1129	7 L	12.7	.39	3121	7.93	33	1.86		214.30
1132	7.5 L	12.3	.38	3109	7.92	35.6	1.72		214.60
1135	8 L	12.4	.40	3117	7.92	39.9	1.65		215.01
1138	8.5 L	12.3	.43	3104	7.91	46.1	1.56		215.31
1141	9 L	12.4	.47	3108	7.91	51	1.94		215.44
1144	9.5 L	12.4	.49	3103	7.91	53.6	1.74	↓	215.74
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS/Anions	1147
	500mL	1	HNO3	Metals	

Comments _____

Signature Myles Schutz Date 10-8-24

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

Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coope
WO: 67251

Chain of Custody

Page 1 of 1

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted 10/9/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Work Order #
Lab Use Only

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW - 19 S	GW	10/8/2024	858	2	N	B, Ca, Cl, F, SO_4, TDS
002	MW - 18 S	GW	10/8/2024	1027	2	N	B, Ca, Cl, F, SO_4, TDS
003	MW - 21 S	GW	10/8/2024	1147	2	N	B, Ca, Cl, F, SO_4, TDS
004	DUPLICATE	GW	10/8/2024	858	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	10/9/2024			10/9/24	1457	1.0°C	Y / N	TM959
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

Appendix B Alternative Source Demonstration

BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

April 30, 2024

Diana Trussell, Manager
Solid Waste Program-Division of Waste Management
North Dakota Department of Environmental Quality
4201 Normandy Street
Bismarck, ND 58503-1324

Dear Ms. Trussell:

Basin Electric Power Cooperative (BEPC) is providing you information from our consultant (AECOM) in accordance with the Coal Combustion Residuals (CCR) regulation's requirements for an Alternative Source Demonstration (ASD). An ASD was conducted for the Antelope Valley Station CCR Landfill because chloride in one well, MW-24(S) located at the far end of the Section 7 CCR landfill, is present at concentrations that are statistically different from the upgradient groundwater. The difference was identified as a statistically significant increase (SSI) in the Annual Groundwater Monitoring and Corrective Action Report dated January 31, 2024.

After publishing the Annual report, AECOM re-evaluated the site-wide data and recommended that an ASD should be conducted prior to May 1, 2024 (within 90 days of SSI determination per CCR Rule) to determine whether to initiate Assessment Monitoring. Analysis of the available data indicates that the chloride concentrations detected at MW-24(S) are due to natural variability in the ambient groundwater at that location. Consequently, Assessment Monitoring will not be initiated and the site will remain in Detection Monitoring.

Future data sets will be used to further evaluate the natural variability of groundwater on site. Such data will include monitoring results from three additional wells that were drilled late in 2023 into 2024 and are expected to be sampled this spring during the next semiannual monitoring event at the landfill.

Enclosed is a copy of the ASD authored by AECOM. If you have any questions, please contact me at 701.557.5488 or email me at mdihle@bepc.com.

Sincerely,

Mark Dihle
Senior Environmental Compliance Administrator

Enclosure

AECOM

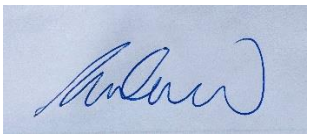
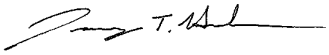
Alternative Source Demonstration
Coal Combustion Residuals (CCR)
Detection Monitoring
Antelope Valley Station CCR Landfill, MW-24(S)

April 30, 2024

Delivering a better world

AECOM

Quality information

Prepared by	Verified by	Approved by
		
Rai Bosch	Dennis Connair	Jeremy Hurshman

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Basin Electric Power Cooperative
Bismarck, North Dakota

Prepared by:

AECOM Technical Services, Inc.
1601 Prospect Parkway
Suite 120
Fort Collins, Colorado 80525
aecom.com

Table of Contents

Figures

Appendices

List of Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
amsl	above mean sea level
ASD	Alternative Source Demonstration
AVS	Antelope Valley Station
Basin	Basin Electric Power Cooperative
CCR	coal combustion residual
CFR	Code of Federal Regulations
cm/s	centimeters per second
ft	feet
mg/L	milligrams per Liter
SSI	statistically significant increase
USEPA	United States Environmental Protection Agency

Alternate Source Demonstration Certification

Basin Electric Power Cooperative Antelope Valley Station, CCR Landfill

AECOM ("Consultant") has been retained by Basin Electric Power Cooperative to certify whether the selected groundwater remedy presented herein for the Antelope Valley Station coal combustion residuals (CCR) Landfill meets the requirements of Chapter 40 of the Code of Federal Regulations (CFR) § 257.94.

LIMITATIONS

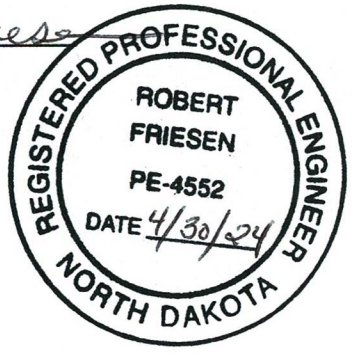
The signature of Consultant's authorized representative on this document represents that to the best of Consultant's knowledge, information, and belief in the exercise of its professional judgment, it is Consultant's professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by Consultant are made on the basis of Consultant's experience, qualifications, and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

CERTIFICATION

I, Robert Friesen, being a Registered Professional Engineer in the State of North Dakota, certify to the best of my knowledge, information, and belief, that the remedy selected by Basin Electric for the CCR unit that is the subject of this certification meets the requirements of 40 CFR § 257.94, and that this certification is true and correct and has been prepared in accordance with generally accepted good engineering practices.

SIGNATURE: Robert Friesen

DATE: April 30, 2024



1 Introduction

At the request of Basin Electric Power Cooperative (Basin), AECOM Technical Services, Inc. (AECOM) has prepared this Detection-mode Alternative Source Demonstration (ASD) for the detection of elevated concentration of chloride in groundwater sampled from monitoring well MW-24(S) at the Antelope Valley Station (AVS) Coal Combustion Residuals (CCR) Landfill, located north of the city of Beulah, North Dakota (Site). Monitoring well MW-24(S), located approximately 1,750 feet (ft) northeast of the existing AVS CCR Landfill footprint, was installed as a potential compliance point for a planned expansion of the landfill footprint (**Figure 1)**. CCR was historically only placed further south within the historical permit boundary until the expansion (including the leachate pond) was constructed and first approved for waste acceptance in 2023 beginning with placement in Cell 5.

This ASD was prepared as allowed by 40 Code of Federal Regulations (CFR) § 257.94(e)(2) of the United States Environmental Protection Agency (USEPA) CCR Rule to evaluate whether the detection of indicator parameters at concentrations that represent statistically significant increases (SSIs) above background levels are the result of an alternative source. This demonstration report presents the statistical test results originally published in AVS's Annual Groundwater Monitoring and Corrective Action report dated January 31, 2024, and presents the alternative source demonstration that a source other than the CCR unit caused the SSI. This ASD provides two separate Site-specific lines of evidence: MW-24(S) is sufficiently distant from the monitored CCR unit that groundwater has not had time to travel from the regulated unit to the affected well, **and** the groundwater chemistry observed in the well is representative of background conditions at this time. Specifically, MW-24(S) groundwater chemistry is both chemically distinct from the other monitoring wells (background and downgradient) at the CCR Landfill and chemically distinct from the character of the CCR Landfill.

2 Summary of Statistically Significant Increases (SSIs)

Under Detection monitoring, the monitoring wells for the AVS CCR Landfill were sampled for Appendix III constituents in July and September to October 2023. These were the first Detection monitoring events for monitoring wells MW-21(S), MW-22(S), and MW-24(S) following eight rounds of baseline sampling after their installation for the monitoring of the Landfill Expansion. Chloride was detected at an SSI above background in monitoring well MW-24(S). As noted above, the SSI determination was declared in the 2023 Annual Groundwater Monitoring and Corrective Action Report (AECOM, 2024) dated January 31, 2024. Statistical analysis results are presented in Attachment B of that report.

3 Alternative Source Demonstration (ASD) under the CCR Rule

Part 257.94(e)(2) of the CCR Rule allows the Owner or Operator 90 days from the date of the initial SSI determination (for Appendix III parameters) to demonstrate that:

- A source other than the CCR unit caused the SSI; or
- The apparent SSI resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

Accordingly, the potential for alternative sources of this sort to have affected the monitoring results was evaluated.

4 ASD Lines of Evidence

The reported SSI results from a persistently elevated chloride concentration in monitoring well MW-24(S). There is no evidence that the SSI resulted from a sampling, laboratory, or statistical error, and there are no known anthropogenic sources of elevated chloride in the vicinity. Instead, the evidence indicates that there is a natural variability in water quality that these data reflect. The lines of evidence are two-fold: groundwater flow rate and groundwater chemistry.

4.1 Groundwater Flow Rate

As noted above, monitoring well MW-24(S) was installed on the east side of the proposed Landfill Expansion footprint as a presumed downgradient compliance monitoring well. This presumption was based on the west to east gradient evidenced by the monitoring system across the existing CCR Landfill footprint. MW-24(S) is not the closest well to current ash placement in the landfill network. The well was installed as part of the network to monitor groundwater as the landfill expands northward.

The elevation of the groundwater level in MW-24(S) is approximately 1864 ft above mean sea level (amsl) (see **Appendix A** for Fall 2023 groundwater elevations), which is lower than both of the upgradient monitoring wells and all of the other downgradient monitoring wells. This suggested that MW-24(S) may also be downgradient of the expansion footprint and potentially even the current CCR Landfill footprint (see **Appendix B** for boring log for MW-24(S)).

The rate of water movement through the subsurface affects the time frame in which groundwater may be potentially impacted by operation of the CCR unit. Water movement can be subdivided into two components, vertical through the unsaturated (vadose zone) and horizontal through the saturated zone.

The vertical component is controlled by the amount of available recharge (rainfall, snowmelt), the rate of infiltration into the subsurface, and the rate of flow through the vadose zone. The National Weather Service reports that the average annual precipitation for the nearby town of Beulah, North Dakota is 16.64 inches, most of which is received from April through October. There are no identified data quantifying the rate of infiltration or vertical flow, but the vadose zone is dominated by 115 to 200 ft of clay-rich mine spoils overlying the clay-rich Lower Sentinel Butte Formation, suggesting that amount of infiltration will be low and the rate of flow through the vadose zone will be slow. Consequently, the rate of vertical transport of a hypothetical leachate release through the vadose zone would be similarly slow.

Upon reaching the saturated zone, horizontal migration of a hypothetical release from the unit to MW-24(S) would also be relatively slow as it would be controlled by the hydraulic gradient and transmissivity of the aquifer. The aquifer on-site is identified as the Spaer Bed lignite. The Spaer Bed is on the order of 6 to 9 ft thick, with a hydraulic conductivity of about 8.26 x 10^{-5} centimeters per second (cm/s) (0.234 feet per day [ft/day]) (AECOM, 2018)

The shortest possible travel time for leachate from the Landfill to MW-24(S), is calculated according to Darcy's equation:

$$v = \left(\frac{K}{n_e}\right)\left(\frac{dH}{dL}\right)$$

where K is the average hydraulic conductivity in cm/sec (8.26 x 10^{-5}), n_e is the effective porosity (0.185 [AECOM, 2018]), and $\frac{dH}{dL}$ is the hydraulic gradient. The hydraulic gradient was obtained by measuring the straight-line ground distance from the northeastern corner of the Landfill to MW-24(S). The head difference, dH, is therefore 1884 ft – 1864.31 ft = 19.69 ft. The ground distance, dL, was measured as 1750 ft, and thus the hydraulic gradient was 0.0113. This suggests a groundwater travel velocity of 5.02 x 10^{-6} cm/s, or 0.0142 ft/day.

The leachate would need to travel a minimum of the 1750 horizontal feet from the northeastern corner of the Landfill to MW-24(S) as well as the vertical distance from the land surface at that corner (about 2100 ft amsl) to the groundwater elevation in MW-24(S) of about 1864 ft amsl, or 2100 ft – 1864 ft = 236 vertical feet. Calculating the vertical component of migration time is complicated, but because the rate of fluid movement through the vadose zone has not been measured, the analysis is focused on the horizontal component, knowing that it will be a conservative estimate of total migration time without inclusion of the vertical component. Traveling at a rate of 0.0142 ft/day, it would take about 123,239 days to cover 1750 ft, or over 337 years for a hypothetical leachate release to migrate from the northern boundary of the Landfill to MW-24(S). Antelope Valley Station began commercial operations in 1984, and the Landfill was constructed under North Dakota Department of Health permit SP-160, issued in 1995 (AECOM, 2018). It can also be noted that the location of MW-24(S) is not located directly downgradient of the historical permit boundary of the landfill. The well is located slightly cross gradient from the original permitted boundary as water is observed to flow in a west to east direction across the southern portion of the historical permit boundary as shown on **Figure 2**. Groundwater flow direction trends slightly to the north in the landfill expansion area. As the locations of MW-24(S) is not directly downgradient from the historical permitted boundary of the landfill, where ash has historically been placed, the estimate of 337 years is even more conservative.

4.2 Groundwater Chemistry

The second line of evidence involves comparisons of different chemistries within the groundwater and comparisons of the groundwater chemistries with that of waters in contact with the Landfill waste.

As previously noted, MW-24(S) has an elevated chloride level relative not only to the upgradient background wells, but also to the other downgradient wells. The key differences are that MW-24(S) has a relatively low sulfate concentration at the same time as having a relatively high chloride concentration. This is illustrated in **Figure 3**, where the relative chloride and sulfate concentrations from 75 groundwater samples are plotted. The plotted data include groundwater samples collected during each of six semi-annual Detection monitoring sampling events for the CCR Landfill (May 2021, October 2021, July 2022, October 2022, July 2023, and September to October 2023), as well as the eight baseline sampling events for MW-21(S), MW-22(S), and MW-24(S) (May 2021; July 2021; September 2021; March 2022; June 2022; July 2022; August 2022; and September 2022) (see **Appendix C** for a summary table of these results). **Figure 1** shows the locations of the collected samples.

The illustrated results indicate that sulfate concentrations in groundwater range from under 100 milligrams per Liter (mg/L) to almost 900 mg/L, while the chloride concentrations range from under 5 mg/L to over 50 mg/L. The only apparent trend in the data is a slight direct correlation between increasing sulfate and increasing chloride in six of the monitoring wells (MW-15(S), -17(S), -18(S), -19(S), -21(S), -22(S)) seen

along the bottom of **Figure 3.** These wells are representative of both upgradient and downgradient positions.

The remaining three wells (MW-16(S), -20(S), and -24(S)) do not show a direct correlation between sulfate and chloride. They all have similarly low sulfate values (less than 100 mg/L) while their chloride values range between 15 mg/L and over 50 mg/L. MW-24(S) is further distinguished from the other two wells by having chloride concentrations that are significantly higher (40 to 50+ mg/L vs. 15 to 27 mg/L). This suggests that MW-24(S) represents a groundwater quality that is distinct from all eight of the other monitoring positions around the CCR Landfill.

Additionally, to evaluate whether the presence of chloride might be representative of the CCR Landfill, chloride and sulfate data from a former contact water pond sampled at location SW-6C, and the expansion leachate collection pond are compared with chloride and sulfate values for MW-24(S). In the contact water samples, chloride concentrations are generally between 1 and 4 percent of sulfate concentrations. In contrast, chloride concentrations in groundwater at MW-24(S) are approximately equivalent to the sulfate concentrations (about 92 to 115 percent). Because chloride and sulfate are both highly soluble and not prone to changing their relative abundance as they migrate through various environmental media, these relationships indicate that groundwater at MW-24(S) is not affected by the CCR Landfill.

5 Conclusion

The lines of evidence presented herein indicate that monitoring well MW-24(S), which has been identified as having a chloride concentration that represents an SSI relative to background, is:

- Separated from surface water recharge (and landfill leachate) by over 200 ft vertically and 1,750 ft horizontally of clay-rich mine spoil over the clay-rich Lower Sentinel Butte Formation, which together represent a significant aquitard,
- Chemically distinct from the other monitoring wells (background and downgradient) at the CCR Landfill, and
- Chemically distinct from the character of the CCR Landfill.

Based on the above lines of evidence, SSIs for chloride concentrations reported in samples collected from MW-24(S) are not the result of impact from the CCR Landfill and are likely to represent a naturally occurring variation in groundwater chemistry. The groundwater monitoring program will not require a transition to Assessment monitoring and will continue as a Detection monitoring program. Future reviews of statistical evaluations based on semi-annual groundwater sampling events will consider this ASD when evaluating data.

NOTE: Prior to development of the ASD, AECOM supported the decision by BEPC in late 2023 to install three additional groundwater monitoring wells in the area of MW-24(S) to enhance the groundwater monitoring network. It is anticipated that beginning in 2024, data from the additional wells should further improve the understanding of groundwater direction and movement adjacent to the MW-24(S) well. The new wells should also provide additional data on geochemistry in the localized area to further augment knowledge of the groundwater for the CCR landfill.

6 Reference

AECOM Technical Services, Inc. (AECOM). 2018. First Annual Groundwater Monitoring and Corrective Action Report 2016-2017, CCR Landfill, Antelope Valley Station, Mercer County, North Dakota. Basin Electric Power Cooperative. January 24, 2018.

AECOM. 2024. 2023 Annual Groundwater Monitoring and Corrective Action Report AVS CCR Landfill, Antelope Valley Station, Beulah, North Dakota, January 31, 2024.

Figures

1st St SW

1st St SW

MW-24(S)

MW-21(S)

MW-23(S)

MW-22(S)

CELL 5

MW-18(S)

MW-17(S)

MW-16(S)

MW-19(S)

MW-20(S)

MW-15(S)

MW-14(S)

59th Ave SW

2nd St SW

2nd St SW

2nd St SW

Legend

- Approximate Landfill Expansion (Permitted)
- Permit Boundary (Historical)
- Leachate Pond (Approximate Location)
- Limits of Ash (Approximate)
- Monitoring Well

N

W E

S

1 inch = 600 feet

0 600 1200

Feet

BASIN ELECTRIC POWER COOPERATIVE
FIGURE 1
AVS CCR MONITORING WELL NETWORK
AS OF DECEMBER 2023

JOB NO. 60635022

AECOM

1st St SW

1st St SW

59th Ave SW

2nd St SW

2nd St SW

2nd St SW

CELL 5

1892

1888

1884

1880

1876

1872

1868

MW-21(s)
(1892.72)

MW-24(s)
(1864.31)

MW-23(s)
Dry

MW-22(s)
(1884.35)

MW-18(s)
(1893.16)

MW-17(s)
(1886.94)

MW-16(s)
(1887.39)

MW-19(s)
(1893.90)

MW-20(s)
(1887.27)

MW-15(s)
(1886.34)

MW-14(s)
NM

Legend

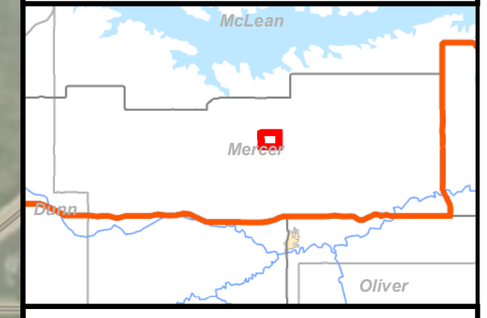
- Approximate Landfill Expansion (Permitted)
- Leachate Pond (Approximate Location)
- Limits of Ash (Approximate)
- Monitoring Well
- Permit Boundary (Historical)
- Piezometric Surface Contour Dashed where inferred (4-foot interval)
- Groundwater Flow Direction

Note:
Groundwater elevations were obtained in September and October 2023.

NM = not measured

N
W
E
S

0 600 1200
Feet

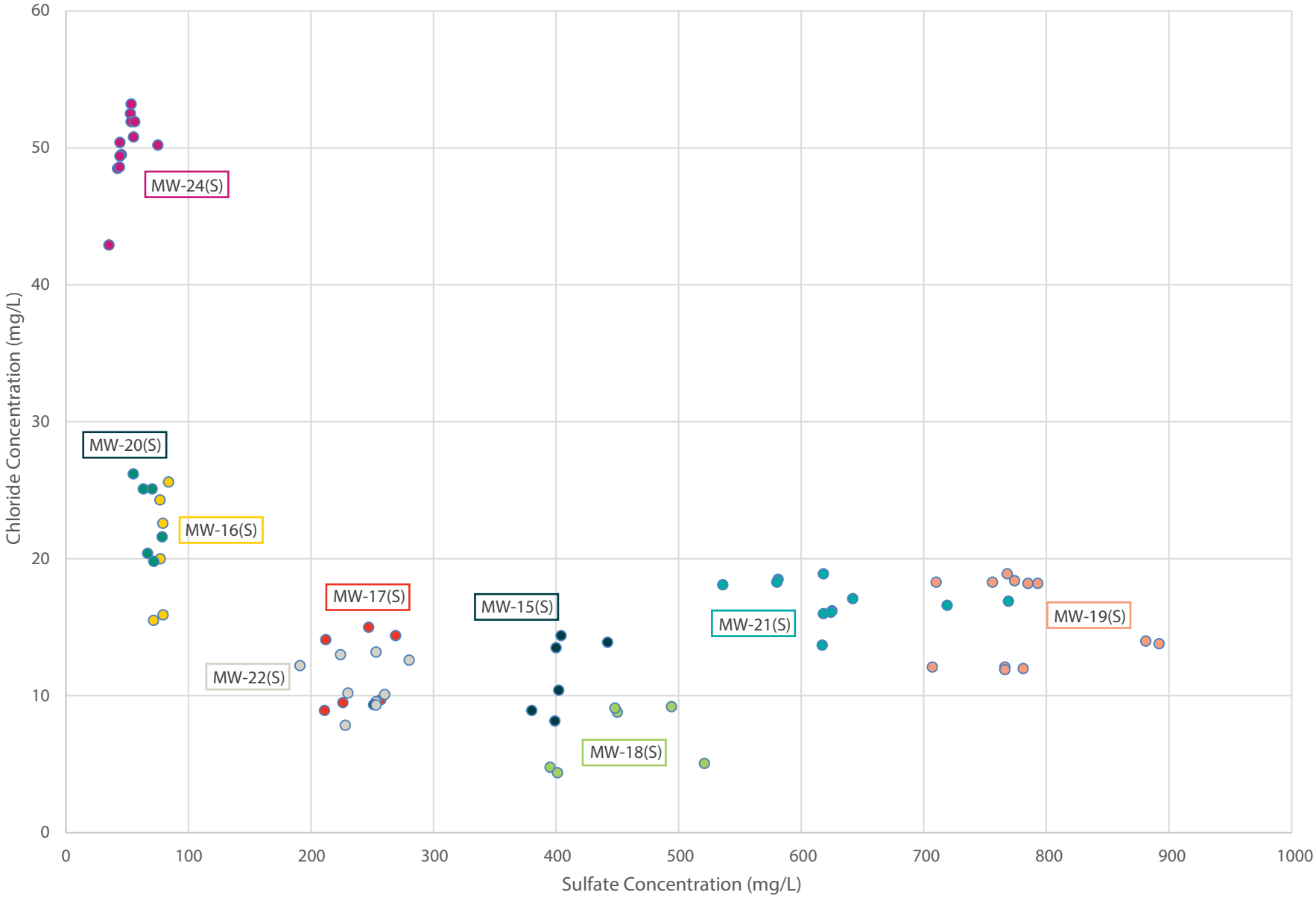


BASIN ELECTRIC POWER COOPERATIVE
FIGURE 2
POTENTIOMETRIC SURFACE MAP
SEPTEMBER AND OCTOBER 2023

JOB NO. 60635022

AECOM

Figure 3. Antelope Valley Station CCR Landfill 2021-2023 Chloride-Sulfate Well Relationships



Appendix A

Summary of Water Levels – Fall 2023

Appendix A
September/October 2023 Groundwater Monitoring Water Levels and Elevations
CCR Landfill Detection Program Groundwater Monitoring
Antelope Valley Station - Beulah, North Dakota

Active Landfill				
		Reference Elevation		Groundwater
		Top of Casing	Depth to Water	Elevation
Well ID	Date	(ft amsl)	(ft btoiwc)	(ft amsl)
MW-14(s)	--	2093.41	Not measured	Not measured
MW-15(s)	9/25/2023	2104.77	218.43	1886.34
MW-16(s)	9/25/2023	2123.59	236.20	1887.39
MW-17(s)	9/25/2023	2124.89	237.95	1886.94
MW-18(s)	9/26/2023	2091.60	198.44	1893.16
MW-19(s)	9/26/2023	2042.56	148.66	1893.90
MW-20(s)	9/26/2023	2107.47	220.20	1887.27
MW-21(s)	10/10/2023	2094.72	202.00	1892.72
MW-22(s)	10/10/2023	2093.90	209.55	1884.35
MW-23(s)	10/10/2023	2080.16	Dry	Dry
MW-24(s)	10/10/2023	2070.74	206.43	1864.31

ft btoiwc = feet below top of inner well casing

ft amsl = feet above mean sea level (Vertical Datum NGVD29)

Appendix B

Monitoring Well MW-24(S) Boring Log

Barr Engineering Company
234 West Century Avenue
Bismarck, ND 58503
Telephone: 701-255-5460

LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.:	2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0					TOPSOIL: black to dark brown; moist to wet; few roots.	Mine Spoils	PRO. CASING Diameter: 6" Type: Steel Interval: 5' to surface + 3'	2065
			SC-SM		CLAYEY TO SILTY SAND (SC-SM): fine to medium grained; yellowish brown 10YR 5/4; moist; trace gravel, few orange oxidized staining.			
5		1			LEAN TO FAT CLAY (CL-CH): dark gray to gray 10YR 4/1 - 6/1; moist; hard to firm; trace lignite inclusions; medium to high plasticity.		RISER CASING Diameter: 2" Type: SCH 80 PVC Interval: 205' to surface + 2.5'	2060
10		2	CL-CH				GROUT Type: Neat Cement Interval: 0-197' bgs	2055
15							SEAL Type: Bentonite Interval: 197-202' bgs	
					LEAN TO FAT CLAY (CL-CH): dark gray to brown 10YR 4/1 - 4/3; moist; hard to firm; trace lignite inclusions, few fine gravel; medium to high plasticity.		SANDPACK Type: 35-45 10WS Interval: 202-217' bgs	2050
20		3	CL-CH				SCREEN Diameter: 2" (#10) Type: SCH 80 PVC Interval: 205-215' bgs	2045
25								
30		4						2040

Date Boring Started:	9/15/20 2:30 pm
Date Boring Completed:	9/17/20 11:40 am
Logged By:	MLJ2
Drilling Contractor:	Cascade
Drill Rig:	Rotosonic

Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

Additional data may have been collected in the field which is not included on this log.

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Barr Engineering Company
234 West Century Avenue
Bismarck, ND 58503
Telephone: 701-255-5460

LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.:	2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
35					LEAN TO FAT CLAY (CL-CH): dark gray to brown 10YR 4/1 - 4/3; moist; hard to firm; trace lignite inclusions, few fine gravel; medium to high plasticity. *(continued)*	Mine Spoils	PRO. CASING Diameter: **6"** Type: **Steel** Interval: **5' to surface + 3'** RISER CASING Diameter: **2"** Type: **SCH 80 PVC** Interval: **205' to surface + 2.5'** GROUT Type: **Neat Cement** Interval: **0-197' bgs** SEAL Type: **Bentonite** Interval: **197-202' bgs** SANDPACK Type: **35-45 10WS** Interval: **202-217' bgs** SCREEN Diameter: **2" (#10)** Type: **SCH 80 PVC** Interval: **205-215' bgs**	2035
40		5	CL-CH					2030
45								2025
50		6			52.5 - 54.5' - bands of fine sand/silt thoughout.			2020
55								2015
60		7			2" siltstone band, fractured, light gray.			2010
65								2005

Date Boring Started:	9/15/20 2:30 pm
Date Boring Completed:	9/17/20 11:40 am
Logged By:	MLJ2
Drilling Contractor:	Cascade
Drill Rig:	Rotosonic

Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

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LOG OF WELL MW-24(S)

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Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
65			CL-SC		SANDY LEAN CLAY TO CLAYEY SAND (CL-SC): fine grained; dark gray 10YR 4/1; moist; low plasticity; 50% sand, 50% fines.	Mine Spoils	PRO. CASING Diameter: 6" Type: Steel Interval: 5' to surface + 3'	2000
70		8	CH		FAT CLAY (CH): dark gray and brown 10YR 4/1 - 4/3; moist; firm; little fine gravel, trace orange oxidized staining; high plasticity; 15% gravel, 85% fines.		RISER CASING Diameter: 2" Type: SCH 80 PVC Interval: 205' to surface + 2.5'	1995
75							GROUT Type: Neat Cement Interval: 0-197' bgs	
80		9					SEAL Type: Bentonite Interval: 197-202' bgs	1990
85							SANDPACK Type: 35-45 10WS Interval: 202-217' bgs	
90		10					SCREEN Diameter: 2" (#10) Type: SCH 80 PVC Interval: 205-215' bgs	1985
								1980
95			CH		FAT CLAY (CH): dark gray 10YR 4/1; moist; firm to hard; few fine gravel; 10% gravel, 90% fines.			1975

Date Boring Started:	9/15/20 2:30 pm
Date Boring Completed:	9/17/20 11:40 am
Logged By:	MLJ2
Drilling Contractor:	Cascade
Drill Rig:	Rotosonic

Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

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LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.:	2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
100		11			FAT CLAY (CH): dark gray 10YR 4/1; moist; firm to hard; few fine gravel; 10% gravel, 90% fines. *(continued)*	Mine Spoils	PRO. CASING Diameter: 6" Type: Steel Interval: 5' to surface + 3' RISER CASING Diameter: 2" Type: SCH 80 PVC Interval: 205' to surface + 2.5' GROUT Type: Neat Cement Interval: 0-197' bgs SEAL Type: Bentonite Interval: 197-202' bgs SANDPACK Type: 35-45 10WS Interval: 202-217' bgs SCREEN Diameter: 2" (#10) Type: SCH 80 PVC Interval: 205-215' bgs	1970
105		12	CH					1965
110		13						1960
					LIGNITE: black; wet to saturated; soft; weathered.			
		14	CL-CH		LEAN TO FAT CLAY WITH LIGNITE (CL-CH): gray to black; moist; firm; 30% lignite, weathered.			1955
115			CH		FAT CLAY (CH): gray and brown; moist; firm to hard; few fine gravel; 10% gravel, 90% fines.			
120		15						1950
					END OF MINE SPOILS - LEAN TO FAT CLAY (CL-CH): very dark gray 10YR 3/1; dry to moist; hard; fractured; medium to high plasticity; 1" lignite band at 127'.	Native Sentinel Butte Formation		1945
125			CL-CH					
130			CL-CH		LEAN TO FAT CLAY (CL-CH): dark greenish gray GLEY1 4/1; dry to moist; hard; fractured with black organic staining on fracture planes; medium to high plasticity.			1940

Date Boring Started:	9/15/20 2:30 pm
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Drill Rig:	Rotosonic

Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

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LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.: 2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic	
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core	
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft	Completion Depth:	220.0 ft	
Datum:	ND State Plane, South Zone, 1927 NAD			

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
130		16	CL-CH		LEAN TO FAT CLAY (CL-CH): dark greenish gray GLEY1 4/1; dry to moist; hard; fractured with black organic staining on fracture planes; medium to high plasticity. *(continued)*	Native Sentinel Butte Formation	PRO. CASING Diameter: **6"** Type: **Steel** Interval: **5' to surface + 3'**	1935
135		17	CL-CH		LEAN TO FAT CLAY (CL-CH): very dark gray 10YR 3/1; dry to moist; hard; fractured with black organic staining on fracture planes; medium to high plasticity.		RISER CASING Diameter: **2"** Type: **SCH 80 PVC** Interval: **205' to surface + 2.5'**	1930
140							GROUT Type: **Neat Cement** Interval: **0-197' bgs**	
145		18					SEAL Type: **Bentonite** Interval: **197-202' bgs**	1925
150			CL-ML		LEAN CLAY TO SILT WITH FINE SAND (CL-ML): greenish gray GLEY1 5/1; moist; hard; low plasticity; 15% sand, 85% fines.		SANDPACK Type: **35-45 10WS** Interval: **202-217' bgs**	1920
					MUDSTONE: light gray 10YR 7/1; fractured.		SCREEN Diameter: **2" (#10)** Type: **SCH 80 PVC** Interval: **205-215' bgs**	
155		19	CL-CH		LEAN TO FAT CLAY (CL-CH): very dark gray 10YR 3/1; moist; hard; thin fine sand lenses throughout; medium to high plasticity.			1915
								1910
160					MUDSTONE: light gray 10YR 7/1; fractured.			
			CL-CH		LEAN TO FAT CLAY (CL-CH): very dark gray 10YR 3/1; moist; hard; medium to high plasticity; 1" lignite band at 162.9'.			

Date Boring Started:	9/15/20 2:30 pm
Date Boring Completed:	9/17/20 11:40 am
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Drilling Contractor:	Cascade
Drill Rig:	Rotosonic

Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

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LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.:	2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
165		20	CL-CH		LEAN TO FAT CLAY (CL-CH): greenish gray GLEY1 6/1; moist; hard; medium to high plasticity.	Native Sentinel Butte Formation	PRO. CASING Diameter: 6" Type: Steel Interval: 5' to surface + 3'	1905
			CL-CH		LEAN TO FAT CLAY (CL-CH): very dark gray 10YR 3/1; moist; hard; medium to high plasticity; 1" lignite band at 166' and 168'.			
170		21					RISER CASING Diameter: 2" Type: SCH 80 PVC Interval: 205' to surface + 2.5'	1900
					LEAN TO FAT CLAY (CL-CH): dark gray to greenish gray; moist; hard; medium to high plasticity.		GROUT Type: Neat Cement Interval: 0-197' bgs	1895
175		22					SEAL Type: Bentonite Interval: 197-202' bgs	
180			CL-CH		182-193' - lenses of fine to medium sand throughout.		SANDPACK Type: 35-45 10WS Interval: 202-217' bgs	1890
185		23					SCREEN Diameter: 2" (#10) Type: SCH 80 PVC Interval: 205-215' bgs	1885
190								1880
195			SC-SM		CLAYEY TO SILTY SAND (SC-SM): fine grained; dark gray; moist; hard; fractured; 65% sand, 35% fines.			1875

Date Boring Started:	9/15/20 2:30 pm
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Remarks: Mine Spoils: 0-122'
Native Sentinel Butte Formation: 122-220'
Spaer Bed Lignite: 206-214'

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LOG OF WELL MW-24(S)

Project:	BEPC AVS Landfill Expansion	Surface Elevation:	2068.2 ft	Top of Casing Elev.:	2071.0 ft
Project No.:	34291096	Drilling Method:	Rotosonic		
Location:	Antelope Valley Station, Beulah, ND	Sampling Method:	Rotosonic Core		
Coordinates:	N 634,449.4 ft E 1,675,151.4 ft				
Datum:	ND State Plane, South Zone, 1927 NAD	Completion Depth:	220.0 ft		

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	MAJOR UNIT	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
195					CLAYEY TO SILTY SAND (SC-SM): fine grained; dark gray; moist; hard; fractured; 65% sand, 35% fines. *(continued)*	Native Sentinel Butte Formation	PRO. CASING Diameter: 6" Type: Steel Interval: 5' to surface + 3'	1870
200		24	SC-SM				RISER CASING Diameter: 2" Type: SCH 80 PVC Interval: 205' to surface + 2.5'	1865
205					LIGNITE: Spaer Bed; black to very dark brown 10YR 2/1 - 2/2; dry; fractured, crumbly.	Spaer Bed Lignite	GROUT Type: Neat Cement Interval: 0-197' bgs SEAL Type: Bentonite Interval: 197-202' bgs	1860
210		25					SANDPACK Type: 35-45 10WS Interval: 202-217' bgs	1855
215		26	SM		SILTY SAND (SM): fine grained; greenish gray GLEY1 5/1; moist; hard; 70% sand, 30% fines.	Native Sentinel Butte Formation	SCREEN Diameter: 2" (#10) Type: SCH 80 PVC Interval: 205-215' bgs	1850
220					End of well 220.0 feet			1845
225								

Date Boring Started: 9/15/20 2:30 pm
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Drilling Contractor: Cascade
Drill Rig: Rotosonic

Remarks: Mine Spoils: 0-122'
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Spaer Bed Lignite: 206-214'

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Appendix C

Summary of Appendix III Analytical Results – 2021 to 2023

Appendix C
2021-2023 CCR Monitoring Network Analytical Results
CCR Landfill Detection Program Groundwater Monitoring
Antelope Valley Station - Beulah, North Dakota

				Appendix III Parameters						
			Analytical Method	Field Measure	SM2540C	SW6010C	SW6010C	SW9056A	SW9056A	SW9056A
			Chemical Name	pH	TDS	Boron	Calcium	Chloride	Fluoride	Sulfate
			Cas Number	PH	TDS	7440-42-8	7440-70-2	16887-00-6	7782-41-4	14808-79-8
			Unit	SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			Sample Fraction	T	T	T	T	T	T	T
Event	**Well ID**	**Sample Date**	**Sample Type**							
2021_05_May	MW-15(S)	5/25/2021	N	7.77	1860	0.155	5.32	8.93	1.47	380
2021_10_Oct	MW-15(S)	10/12/2021	N	8.17	1810	0.144	4.04	8.16	1.62	399
2022_07_July	MW-15(S)	7/13/2022	N	8.29	1820	0.147	5.37	10.4	4.44	402
2022_10_Oct	MW-15(S)	10/26/2022	N	8.05	1880	0.10	4.27	14.4	1.41	404
2023_07_July	MW-15(S)	7/18/2023	N	8.00	1860	< 0.1	4.14	13.9	1.39	442
2023_26_Sep	MW-15(S)	9/26/2023	N	7.94	1880	0.12	3.70	13.5	1.43	400
2021_05_May	MW-16(S)	5/25/2021	N	8.72	1120	0.172	3.96	15.9	1.84	79.3
2021_10_Oct	MW-16(S)	10/12/2021	N	8.96	1050	0.176	3.51	15.5	1.93	71.6
2022_07_July	MW-16(S)	7/13/2022	N	8.14	816	0.188	2.21	20.0	1.72	77.0
2022_10_Oct	MW-16(S)	10/26/2022	N	8.11	1180	0.12	3.26	22.6	1.83	79.0
2023_07_July	MW-16(S)	7/18/2023	N	8.83	973	0.12	2.11	25.6	2.42	83.7
2023_26_Sep	MW-16(S)	9/26/2023	N	8.31	1120	0.017	2.02	24.3	2.06	76.7
2021_05_May	MW-17(S)	5/25/2021	N	7.87	1740	0.156	4.74	9.51	1.49	226
2021_10_Oct	MW-17(S)	10/12/2021	N	8.2	1700	0.155	4.22	8.92	1.56	211
2022_07_July	MW-17(S)	7/13/2022	N	7.92	1660	0.147	3.88	9.71	4.24	257
2022_10_Oct	MW-17(S)	10/26/2022	N	8.01	1740	< 0.1	3.59	15.0	1.38	247
2023_07_July	MW-17(S)	7/18/2023	N	7.97	1700	0.10	3.95	14.4	1.48	269
2023_26_Sep	MW-17(S)	9/26/2023	N	7.86	1330	0.13	3.60	14.1	1.52	212
2021_05_May	MW-18(S)	5/26/2021	N	9.09	1670	0.121	4.36	4.78	1.35	395
2021_10_Oct	MW-18(S)	10/12/2021	N	9.46	1650	0.125	9.58	4.38	1.39	401
2022_07_July	MW-18(S)	7/13/2022	N	9.02	1680	0.119	4.92	5.06	3.93	521
2022_10_Oct	MW-18(S)	10/26/2023	N	9.07	1730	< 0.1	3.60	8.8	1.17	450
2023_07_July	MW-18(S)	7/18/2023	N	9.16	1730	< 0.1	4.90	9.2	1.24	494
2023_26_Sep	MW-18(S)	9/26/2023	N	9.19	1780	0.10	4.32	9.1	1.26	448
2021_05_May	MW-19(S)	5/26/2021	FD	--	2110	0.164	4.39	12.1	0.903	766
2021_05_May	MW-19(S)	5/26/2021	N	7.87	2120	0.166	4.43	12.1	0.909	707
2021_10_Oct	MW-19(S)	10/12/2021	FD	--	2080	0.16	4.13	11.9	0.925	766
2021_10_Oct	MW-19(S)	10/12/2021	N	7.99	2090	0.159	4.11	12.0	0.878	781
2022_07_July	MW-19(S)	7/13/2022	N	8.08	2070	0.157	3.99	13.8	4.15	892
2022_07_July	MW-19(S)	7/13/2022	FD	--	45500	0.151	3.98	14.0	4.15	881
2022_10_Oct	MW-19(S)	10/26/2022	N	8.03	2190	0.10	3.97	18.2	0.64	785
2022_10_Oct	MW-19(S)	10/26/2022	FD	8.03	2190	0.10	3.93	18.2	0.64	793
2023_07_July	MW-19(S)	7/18/2023	N	8.07	2100	0.10	4.29	18.9	0.66	768
2023_07_July	MW-19(S)	7/18/2023	FD	8.07	2110	0.10	4.26	18.4	0.69	774
2023_26_Sep	MW-19(S)	9/26/2023	N	7.96	2160	0.13	3.94	18.3	0.69	756
2023_26_Sep	MW-19(S)	9/26/2023	FD	7.96	2180	0.13	3.97	18.3	0.72	710
2021_05_May	MW-20(S)	5/25/2021	N	7.84	1840	0.151	6.73	19.8	1.31	71.7
2021_10_Oct	MW-20(S)	10/12/2021	N	7.89	1810	0.154	6.12	20.4	1.41	66.6
2022_07_July	MW-20(S)	7/13/2022	N	7.96	1790	0.14	5.25	21.6	4.52	78.5
2022_10_Oct	MW-20(S)	10/26/2022	N	8.00	1800	0.10	4.20	26.2	1.14	55.0
2023_07_July	MW-20(S)	7/18/2023	N	7.96	1800	0.10	4.68	25.1	1.21	70.4
2023_26_Sep	MW-20(S)	9/26/2023	N	7.93	1860	0.13	4.44	25.1	1.25	63.1
2021_05_May	MW-21(S)	5/26/2021	N	7.83	2240	0.155	8.62	13.7	1.54	617
2021_07_July	MW-21(S)	7/21/2021	N	7.9	2270	0.141	6.6	16.0	1.20	618
2021_09_Sep	MW-21(S)	9/29/2021	FD	7.9	2690	0.154	2.67	16.9	1.32	769
2021_09_Sep	MW-21(S)	9/29/2021	N	7.9	2160	0.151	6.27	16.6	1.34	719
2022_03_Mar	MW-21(S)	3/31/2022	N	8.13	2160	0.156	6.18	17.1	1.2	642
2022_05_May	MW-21(S)	5/26/2022	N	7.63	--	0.14	5.25	--	--	--
2022_06_June	MW-21(S)	6/23/2022	N	--	2130	--	--	16.2	5.72	625
2022_07_July	MW-21(S)	7/19/2022	N	8.08	2170	0.136	4.71	16.1	4.97	624
2022_08_Aug	MW-21(S)	08/24/2022	N	8.03	2220	0.14	5.43	18.9	1.49	618
2022_09_Sep	MW-21(S)	09/28/2022	N	8.00	2200	0.14	5.12	18.5	1.41	581
2023_07_July	MW-21(S)	7/25/2023	N	7.93	2600	0.11	5.59	18.3	1.36	580
2023_11_Oct	MW-21(S)	10/11/2023	N	7.93	2140	0.13	4.77	18.1	1.35	536
2021_05_May	MW-22(S)	5/24/2021	N	7.99	1640 H	0.147	2.9	7.84	1.69	228
2021_07_July	MW-22(S)	7/21/2021	N	8.11	1660	0.149	2.74	9.58	1.50	253
2021_09_Sep	MW-22(S)	9/29/2021	N	7.97	1610	0.152	6.47	10.1	1.61	260
2022_03_Mar	MW-22(S)	3/31/2022	N	8.27	1630	0.159	4.03	10.2	1.51	230
2022_05_May	MW-22(S)	5/26/2022	N	7.81	--	0.143	2.43	--	--	--
2022_06_June	MW-22(S)	6/23/2022	N	7.87	1600	--	--	9.34	4.25	251
2022_07_July	MW-22(S)	7/19/2022	N	8.25	1580	0.141	2.59	9.32	4.01	253
2022_08_Aug	MW-22(S)	08/24/2022	N	8.22	1660	0.16	2.72	13.2	1.78	253
2022_09_Sep	MW-22(S)	09/28/2022	N	8.20	1630	0.14	2.66	13.0	1.69	224
2023_07_July	MW-22(S)	7/26/2023	N	8.17	1650	0.12	2.76	12.6	1.60	280
2023_11_Oct	MW-22(S)	10/11/2023	N	8.10	1640	0.14	2.75	12.2	1.62	191
2021_05_May	MW-24(S)	5/25/2021	N	7.8	2040	0.129	6.08	42.9	1.59	35.2
2021_07_July	MW-24(S)	7/21/2021	N	8.14	2040	0.12	5.62	48.5	1.22	42.1
2021_09_Sep	MW-24(S)	9/29/2021	N	8.03	1610	0.134	5.08	49.5	1.33	45.3
2022_03_Mar	MW-24(S)	3/31/2022	N	8.23	1840	0.135	5.42	50.4	1.23	44
2022_05_May	MW-24(S)	5/26/2022	N	7.79	--	0.125	5.07	--	--	--
2022_06_June	MW-24(S)	6/23/2022	N	7.85	1930	--	--	48.6	6.04	43.7
2022_07_July	MW-24(S)	7/19/2022	N	8.15	1960	0.123	4.71	49.4	4.9	44
2022_08_Aug	MW-24(S)	08/24/2022	N	8.15	2020	0.16	5.11	50.2	1.47	75.1
2022_09_Sep	MW-24(S)	09/28/2022	N	8.14	1980	0.12	5.44	52.5	1.41	52.6
2022_09_Sep	MW-24(S)	09/28/2022	FD	8.14	1990	0.12	5.40	51.9	1.40	53.3
2023_07_July	MW-24(S)	7/25/2023	N	8.09	1970	0.10	4.64	53.2	1.38	53.3
2023_11_Oct	MW-24(S)	10/11/2023	N	8.05	1960	0.11	4.34	51.9	1.44	56.1
2023_11_Oct	MW-24(S)	10/11/2023	FD	8.05	2010	0.11	4.42	50.8	1.31	55.1

Notes:
CCR = coal combustion residual
FD = field duplicate
mg/L = milligrams per liter
N = parent sample
SU = standard unit
T = total

Appendix D

Summary of Analytical Results: AVS Leachate Pond and Old Surface Landfill Sump – 1985 to 2023

Appendix D
1985-2023 AVS Leachate Pond and Old Surface Landfill Sump
Antelope Valley Station - Beulah, North Dakota

AVS Leachate Pond, 8/8/2023	
Chloride (mg/L)	8.10
Sulfate (mg/L)	368
Chloride to Sulfate Ratio	0.0220
SW-6C, 1985-2018	
Minimum chloride (mg/L)	3
Second smallest chloride (mg/L)	8
Average chloride (mg/L)	312
Second largest chloride (mg/L)	1080
Maximum chloride (mg/L)	1090
Minimum sulfate (mg/L)	733
Second smallest sulfate (mg/L)	1025
Average sulfate (mg/L)	9666
Second largest sulfate (mg/L)	32600
Maximum sulfate (mg/L)	37352
Minimum chloride to sulfate ratio	0.00293
Second smallest chloride to sulfate ratio	0.00796
Average chloride to sulfate ratio	0.0279
Second largest chloride to sulfate ratio	0.0405
Maximum chloride to sulfate ratio	0.0402

Technical Memorandum

To: Mark Dihle, Basin Electric Power Cooperative
From: Barr Engineering Co.
Subject: Alternative Source Demonstration (ASD), Antelope Valley Station (Spring 2024)
Date: January 3, 2025
Project: 34291134.00

1 Introduction

Basin Electric Power Cooperative (Basin Electric) owns and operates Antelope Valley Station (AVS), comprised of a coal-fired generating station consisting of two power generating units, located in Beulah, North Dakota (Figure 1). Unit 1 coal-based operations began in 1984, and Unit 2 operations began in 1986. The landfill (Site or CCR Landfill) was permitted by the North Dakota Department of Environmental Quality (NDDEQ) in 1995 under Permit SP-160 (now designated 0160) and began accepting coal combustion residuals (CCR) in 1996. The most recent Permit 0160 was issued by NDDEQ in early 2022, and the most recent cell including a composite liner system and leachate collection system was constructed the same year. Basin Electric utilizes a consulting firm, Barr Engineering Co. (Barr) to assist in groundwater reporting and analysis. Barr is familiar with the site and installed and certified the most recent wells (MW-25S, MW-26S, and MW-27S) added to the network. Barr has reviewed the historical groundwater data and CCR information for the site and is knowledgeable about facility design and operation.

The CCRs including fly ash, bottom ash, and flue gas desulfurization (FGD) waste are managed at the Site along with other minor wastes accepted as per the NDDEQ permit. 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 NDDEQ CCR Rule (NDAC Title 33.1, Article 20, Chapter 8).

Basin Electric has implemented a Detection Monitoring Program in accordance with the U.S. Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261) for the Site. As part of the Detection Monitoring Program, statistically significant increases (SSIs) in monitored groundwater quality parameters over background were identified at the Site for the following monitoring wells during semi-annual detection monitoring completed in the spring of 2024 on June 11-13 and 17, 2024:

- MW-16S – Chloride
- MW-20S – Chloride
- MW-24S – Chloride
- MW-25S – Chloride (initial sampling event)
- MW-26S – Chloride (initial sampling event)
- MW-27S – Boron, calcium, chloride, and total dissolved solids (TDS) (initial sampling event)

The CCR Rule (US EPA, 2015) § 257.94(e)(2) allows for an alternative source demonstration (ASD) in the event of an identified 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 June 2024 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. Nothing in the foregoing citation of the rule requires that the owner/operator disprove any and all potential counterarguments that EPA or others may offer to refute this demonstration. Such arguments if valid, would need to follow requirements of the rule to show a basis in fact that includes rule requirements that are based on site-specific information, and must be certified by a North Dakota licensed professional engineer. This memorandum provides a science-based reason for the data results that indicate a source other than the CCR unit.

This memorandum provides written documentation of an Alternative Source Demonstration (ASD) and certification of accuracy as described in the CCR Rule (§ 257.94(e)(2)).

1.1 Background Information

Figure 1 shows the site location and Figure 2 provides well locations. A piezometric surface map showing groundwater elevations in the lignite, which represent the uppermost aquifer in the vicinity of the CCR landfill, is presented on Figure 3, using measurements from June 2024. Groundwater generally flows from southwest to northeast.

In late 2023, three new landfill expansion wells, MW-25S, MW-26S, and MW-27S, were installed at the Site. Baseline sampling was initiated in June 2024, and these wells were first evaluated in the detection monitoring program in June 2024. Since the June 2024 sampling event was the first time samples were collected at MW-25S, MW-26S, and MW-27S, the Appendix III parameters cannot be compared to historical data at those locations.

A comparison of the detection monitoring groundwater results with the prediction limits calculated using the 2016-2023 background assessment data from upgradient wells MW-18S, MW-19S, and MW-21S are included in Table 1. Concentrations for Appendix III parameters observed in June 2024 are shown on time series graphs in Attachment A. Chloride concentrations at MW-16S, MW-20S, and MW-24S are consistent with those observed during baseline monitoring events

Table 1 SSIs Compared to Prediction Limits

Event	Well	Parameter (units)	Measured	Interwell Prediction Limit
Detection Monitoring – 2024 #1 (Spring)	MW-16S	Chloride (mg/L)	32.7	18.7
	MW-20S	Chloride (mg/L)	25.9	18.7
	MW-24S	Chloride (mg/L)	48.8	18.7
	MW-25S	Chloride (mg/L)	43.8	18.7
	MW-26S	Chloride (mg/L)	29.7	18.7
	MW-27S	Boron (mg/L)	0.19	0.17
	MW-27S	Calcium (mg/L)	28.3	13.0
	MW-27S	Chloride (mg/L)	80.8	18.7
	MW-27S	Total Dissolved Solids (mg/L)	2290	2230

1.2 Rule Requirements

The requirements for written documentation and certification of accuracy for an ASD are included in §257.95(g) (3):

> *Within 90 days of finding that any of the constituents listed in appendix IV to this part have been detected at a statistically significant level exceeding the groundwater protection standards the owner or operator must… Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in Appendix III and Appendix IV of this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority.*

In accordance with the above requirement, this memorandum is being issued within 90 days of the SSI determination (October 8, 2024) following the review and analysis of the results provided in the final laboratory report which was received on July 10, 2024.

2 Potential Alternative Sources Review

The CCR Rule provides five potential alternative source categories:

1. A source other than the CCR unit

2. Sampling (or sampling equipment) methods
3. Laboratory methods
4. Statistical methods
5. Natural variation in groundwater quality

Site data were evaluated to identify potential causes for chloride concentrations in monitoring wells MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S; and boron, calcium, chloride, and totals dissolved solids concentrations in MW-27S exceeding interwell prediction limits. Chloride is naturally occurring and may not necessarily be the result of a release from a CCR unit; therefore, a source other than the CCR unit, natural variation in groundwater quality, and statistical methods were further investigated as part of the ASD. Sampling methods were further investigated for the boron, calcium, chloride, and totals dissolved solids (TDS) SSIs at MW-27S.

2.1 Travel Time from Source of Release

Monitoring locations MW-24S, MW-25S, MW-26S, and MW-27S were added to the monitoring network in anticipation of waste placement in the landfill expansion area (Figure 3). Waste was first placed in lined Cell 5 in the landfill expansion area in May 2023. Groundwater travel time was considered both vertically as groundwater moves through the unsaturated zone and horizontally as groundwater moves in the saturated zone.

2.1.1 Migration through the liner

Vertical migration of leachate would be controlled by the presence of a driving head the on landfill liner and then migration through the unsaturated zone.

There is no evidence of leachate accumulation on the liner. However, landfill leachate thickness is limited to 1 foot on the liner by rule in North Dakota. Even if the 60-mil thick synthetic liner were breached (again there is no evidence that this has ever occurred,), the underlying 2-foot-thick clay liner was tested and verified to exhibit a vertical permeability of 1 x 10^{-7} cm/s (2.8 x 10^{-4} feet/day) or less. Assuming a 1-foot driving head over a 2-foot-thick liner yields a vertical hydraulic gradient of 0.5 ft/ft.

The vertical advective velocity (average linear velocity or seepage velocity) of vertical saturated groundwater flow is calculated using the following equation:

$$v = \left(\frac{Kv}{n_e}\right)\left(\frac{dHv}{dLv}\right)$$

Or, stated in a more compact form:

$v = \frac{Ki}{n_e}$, where K = hydraulic conductivity, *i* = gradient, and n_e = effective porosity.

Using an effective porosity for clay of 0.40, the above equation yields an advective velocity 3.5 x 10^{-4} ft/day. Dividing the distance by the velocity yields a travel time of 15.7 years to transit the liner.

2.1.2 Migration through the unsaturated zone

Assuming that the leachate fully breached the liner, the release would then need to transit through the entire unsaturated zone to reach the water table below the facility. Although unsaturated flow can be

complex, its calculation can be greatly simplified by making a conservative assumption that the flow is saturated. This is a conservative assumption because unsaturated flow would be characterized by a wetting front (and possible drying cycles) that would result in much lower velocities (longer travel time) than are estimated by assuming saturated flow.

The geologic cross sections and well logs suggest that the mine spoils and Sentinel Butte Formation are thinnest in the vicinity of MW-23S. Assuming that the base of the landfill is at 2050 feet (MSL), the mine spoils are about 90 feet thick at MW-23S, and the Sentinel Butte is about 80 feet thick above the Spaer Bed.

Geotechnical testing of materials at the site has shown mine spoils exhibit relatively low vertical hydraulic conductivities. The four undisturbed vertical hydraulic conductivity values for the mine spoils were 1.3 x 10^{-7} cm/sec, 4.0 x 10^{-8} cm/sec, 2.8 x 10^{-6} cm/sec, and 5.3 x 10^{-7} cm/sec (Terracon, 2020), which have a geometric mean of 3.0 x 10^{-7} cm/sec.

The maximum gradient possible would be for a constant head of 1-foot above the liner during the entire travel time through the spoils, or (1 ft / 90 ft = 0.011 ft/ft). This is a conservative estimate because it is likely that the gradient would be much lower and that there would be intervals of unsaturated transport beneath the clay liner, which is slower than saturated transport.

Using the moisture contents of the samples in the falling head hydraulic conductivity measurements and a particle specific gravity of 2.72 (Terracon, 2020), the four undisturbed porosities were 0.39, 0.45, 0.43, and 0.43. Lower effective porosity results in higher flow velocity so assuming n_e = 0.39 leads to a conservative result. Using the values described above, groundwater flow velocity (v) = 3.0 x 10^{-7} cm/sec * 0.011 ft/ft / 0.39 = 8.54 x 10^{-9} cm/sec or 0.00088 ft/year. Assuming a thickness of 90 feet, travel time through the mine spoils under the clay liner is 90 ft / 0.0088 ft/year = 10,177 years.

Like the mine spoils, the sediments of the Sentinel Butte Formation are predominately clay; however, they are native sediments and are expected to have lower K_v values. Five undisturbed vertical hydraulic conductivity values for the Sentinel Butte Formation at the WISCO Landfill (Barr, 2013) were 7.0 x 10^{-9} cm/sec, 1.1 x 10^{-8} cm/sec, 3.5 x10^{-9} cm/sec, 2.5 x 10^{-9} cm/sec, and 6.7 x 10^{-9} cm/sec. Six undisturbed vertical hydraulic conductivity values for the Sentinel Butte Formation at the Minnkota Coal Combustion Residuals Unit (Barr, 2012) were 3.6 x 10^{-8} cm/sec, 5.0 x 10^{-9} cm/sec, 8.8 x 10^{-8} cm/sec, 1.2 x 10^{-8} cm/sec, 1.0 x 10^{-8} cm/sec, and 1.0 x 10^{-9} cm/sec. Together, these eleven values have a geometric mean of 8.0 x 10^{-9} cm/sec.

The gradient is assumed to be a constant head of 1-foot above the liner during the entire travel time through the Sentinel Butte Formation, or (1 ft / 80 ft = 0.0125 ft/ft). This is a conservative estimate because it excludes the layer of spoils above, which, if factored in, would reduce the gradient and therefore the resulting flow velocity. Using the values described above (K= 8.0 x 10^{-9} cm/sec, i = 0.0125 ft/ft and n_e = 0.39), the vertical flow velocity (v) through the Sentinel Butte Formation is estimated as v = 8.0 x10^{-9} cm/sec * 0.0125 / 0.39 = 2.564 x 10^{-8} cm/sec or 0.00265 ft/year. Given the thickness of the Sentinel Butte Formation overlying the Spaer Bed is approximately 80 feet, travel time is 80 ft / 0.00265 ft/year = 301,552 years.

Assuming a breach in the geomembrane liner and 1 foot of head, the estimated minimum travel time for CCR leachate to travel through the unsaturated zone and reach the Spaer Bed is 311,744 years (15

years for the clay liner, 10,177 years for the mine spoils, and 301,552 years for the Sentinel Butte Formation).

2.1.3 Horizontal Migration in Groundwater

Once a hypothetical release has migrated through the liner and unsaturated zone, it could then reach the water table in the Spaer Lignite seam and eventually reach the detection monitoring well. The velocity of horizontal groundwater flow is calculated using the following equation:

$$v = \left(\frac{K}{n_e}\right)\left(\frac{dH}{dL}\right)$$

The hydraulic gradient $\left(\frac{dH}{dL}\right)$ between MW-25S and MW-24S is 0.015 ft/ft based on the June 2024 piezometric surface map. Groundwater velocity for the wells in the expansion area is 7.0 ft/year. The greatest seepage velocity calculated for the Site (using wells farther south in the existing landfill area) in the 2023 Annual Groundwater Monitoring and Corrective Action Report (AGMCAR; AECOM, 2024) was 4.09 ft/year.

Since the waste was placed in the lined landfill expansion cell only a year prior to the spring 2024 detection monitoring event, it is not plausible for any leachate to reach the monitoring wells.

Using a groundwater velocity of 7.0 ft/year, it would take approximately 167 years for a release to reach MW-24S, MW-25S, MW-26S, or MW-27S. CCR placement in the Landfill began in 1996. Therefore, the elevated chloride at MW-24S, MW-25S, MW-26S, and MW-27S and elevated boron, calcium, and TDS at MW-27S cannot be from the CCR unit.

Since the waste was placed in the lined landfill area started in 1996 or about 28 years ago, it is not plausible for any leachate to reach the monitoring wells given these conservative assumptions. The distances used to calculate travel time are measured from the existing waste limit. MW-25S is located closest to the existing landfill boundary and is approximately 1170 feet downgradient along the shortest flow path. MW-27S is farthest from the CCR waste (approximately 2800 feet).

Assuming that some unidentified preferential flow pathway were to exist, it would have to result in an over four order of magnitude (10,000x) increase in flow rate (or some combination of rate, gradient, or porosity) to allow for a release to reach the boundary. Even in this extreme case, it would still take hundreds of years to reach the downgradient boundary. Such flow rates are not reasonably likely given the construction quality control on the liner, the thickness of the spoils, and the fine-grained nature of the geology and spoils

The long time of travel supports the hypothesis that the CCR unit is not the source of the chloride observed at MW-24S, MW-25S, and MW-26S; and boron, chloride, calcium, and TDS at MW-27S.

2.2 Natural Variability in Groundwater

Site specific chloride values are variable at the site and range from 7.84 to 16.0 mg/L at downgradient wells other than those with chloride SSIs in spring 2024 (MW-15S, MW-17S, and MW-22S) from 2016 to 2024. Chloride at upgradient wells (MW-18S, MW-19S, and MW-21S) ranged from 4.38 to 18.9 mg/L as shown on time series graphs in Attachment A.

Further evaluation of sulfate concentrations, which are a principal indicator of a CCR unit release to groundwater, demonstrate that MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S are not impacted by a release from the CCR landfill. Sulfate concentrations during the June 2024 sampling event at these locations ranged from 24.6 mg/L to 69.9 mg/L. The sulfate concentrations at the upgradient Landfill monitoring locations (MW-18S, MW-19S, and MW-21S) ranged from 263 to 892 mg/L, and at downgradient wells other than those with SSIs (MW-15S, MW-17S, and MW-22S), sulfate ranged from 183 to 442 mg/L from 2016 to 2024. Sulfate at MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S is much lower than both upgradient and downgradient monitoring locations.

Although MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S have elevated chloride concentrations compared to upgradient wells, sulfate concentrations are lower compared to the rest of the monitoring locations. The low sulfate at MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S suggest that the chloride is unlikely to come from a CCR unit release because groundwater impacted by a release should have elevated concentrations of multiple Appendix III parameters. **Therefore, because other indicators of the CCR unit are absent, we reject the hypothesis that the CCR unit is the source of the chloride observed at MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S.**

2.4 Statistical Methods

Interwell prediction limits are currently used to evaluate for SSIs. Interwell prediction limits are valid for the site if the stationarity of the mean and variance are assumed to be constant between upgradient monitoring wells MW-18S, MW-19S, and MW-21S and the downgradient wells (USEPA, 2009). The upgradient monitoring wells are not directly downgradient of a CCR unit (Figure 3). According to the EPA Unified Guidance (USEPA, 2009; page 6-31), interwell tests alone may not be suitable for sites with non-stationarity of distribution mean and variance. Non-stationarity may be expected due to historical mining activities and due to heterogeneity within the lignite documented at the Site.

Therefore, intrawell limits are also valid per the guidance. As shown in Table 2 below, using intrawell prediction limit methods indicates there is no SSI for chloride at MW-20S and MW-24S (Attachment B). Using a combination of interwell and intrawell methods at the site would account for site specific heterogeneity and historical conditions and would eliminate the SSI determination at MW-20S and MW-24S.

Table 2 SSIs Compared to Intrawell Prediction Limits

Event	Well	Parameter (units)	Measured	Intrawell Prediction Limit
Detection Monitoring – 2024 #1 (Spring)	MW-16S	Chloride (mg/L)	32.7	29.7
	MW-20S	Chloride (mg/L)	25.9	31
	MW-24S	Chloride (mg/L)	48.8	59.4

Intrawell methods cannot be used at MW-25S, MW-26S, and MW-27S until at least 8 baseline samples have been collected.

2.5 Trend Testing

If a release from the landfill were occurring, it is likely that the increase in mass to the flow system would cause a change in the chemical equilibrium of the flow system that would reflect changes in concentration overtime. Therefore, if the concentrations of chloride at MW-16S, MW-20S, and MW-24S were due to a release from the landfill there should be evidence of a statistically significant increasing trend.

As shown in Attachment B, each of the data sets were tested for trends using the Mann-Kendall method and no significant trend for chloride was observed for either MW-16S, MW-20S, or MW-24S.

This leads to the conclusion that there is no release related to the observed concentrations of chloride at MW-16S, MW-20S, and MW-24S.

2.6 Well Sampling and Development at MW-27S

Monitoring well MW-27S was installed in November 2023, and well development was attempted in April 2024. Approximately one well volume (~4 gallons) was purged during development before the well went dry. It is unlikely that the well was completely developed after this first attempt. The well will need to recharge and be purged multiple times in order to achieve full development.

Based on field notes, low-flow sampling methods were not used during sample collection at MW-27S during the June 2024 detection monitoring event. Specifically, the well was not purged and allowed to stabilize prior to sample collection, instead a hydrasleeve was used to collect the sample due to slow groundwater recharge times.

The preamble to the CCR Rule (VI(K)(3)) notes that “Groundwater sampling should be conducted utilizing EPA protocol low stress (low-flow) purging and sampling methodology, including measurement and stabilization of key indicator parameters prior to sampling.” Well stabilization is conducted prior to groundwater sampling in order to obtain a sample representative of aquifer conditions. Properly constructed and developed groundwater monitoring wells allow for the collection of representative samples with low turbidity (U.S. EPA, 1986, 1992). However, even correctly installed wells can produce turbid samples in certain geologic materials. Thus, purging and stabilization are necessary to yield reproducible sampling results. Due to limited recharge, monitoring well MW-27S was not sufficiently purged and did not stabilize during the spring 2024 sampling. Field notes from well development are included in Attachment C.

Monitoring well MW-27S has been documented as being slow to recharge (Barr, 2024). Obtaining sufficient groundwater volume for analysis at MW-27S has proven challenging. As a result, the sample sent for laboratory chemical analysis in spring 2024 consisted of the initial draw of water from the well without stabilization. Turbidity readings were 570 NTU and the sample color was described as black, yielding a sample with a high concentration of suspended solids, which is not representative of typical aquifer conditions. Therefore, the SSI is attributed to error in sampling.

The CCR Rule requires measurement of “total recoverable metals” because suspended and colloidal particles can also be a means of transport for contaminants. However, the suspended solids responsible for the boron, calcium, chloride, and TDS SSI at monitoring well MW-27S are believed to be natural aquifer material and not mobilized CCR contaminants.

Therefore, due to slow recharge times preventing full development and the well to be purged before sampling, the sample collected from MW-27S is not representative of aquifer conditions and is not a representative sample.

3 Conclusion

An alternative source demonstration for chloride at this site is supported by the following lines of evidence:

- Based on groundwater flow velocities and timing of CCR placement, the elevated chloride (and boron, calcium, chloride, and TDS at MW-27S) concentrations could not have come from the CCR unit.
- Chloride in groundwater is variable across the site. While there are somewhat elevated concentrations of chloride in many downgradient wells, there are low sulfate concentrations. Only this single detection monitoring parameter indicated an SSI in several monitoring wells. There is a relative absence of sulfate, a primary indicator of a release, in the groundwater as compared to the presence of sulfate in the water within the upgradient monitoring wells and the downgradient wells with lower chloride. Groundwater chemistry in the expansion area wells is both chemically distinct from the other monitoring wells (background and downgradient) at the CCR unit and chemically distinct from the character of the CCR unit.
- Intrawell statistical methods did not result in an SSI for chloride at MW-20S and MW-24S. There are not enough baseline samples at MW-25S, MW-26S, and MW-27S for intrawell analyses.
- Well sampling and development limitations due to slow groundwater recharge resulted in high turbidity and the SSIs for boron, calcium, chloride, and TDS at MW-27S.

As this report demonstrates, the SSI analysis presented in Table 1 for monitoring wells MW-16S, MW-20S, MW-24S, MW-25S, and MW-26S is attributed to a source other than the CCR Unit for chloride in the groundwater. The SSI analysis for boron, calcium, chloride, and TDS at MW-27S is attributed to sampling techniques due to non-representative aquifer conditions from slow groundwater recharge rates.

Future monitoring data will add to our understanding of the site and the results are expected to augment this ASD and conclusions.

4 References

AECOM, 2024. 2023 Annual Groundwater Monitoring and Corrective Action Report, AVS CCR Landfill. January 2024.

Barr, 2012. Letter to Minnkota Power Cooperative, Inc., Regarding Cells 4, 5, and 6 Drilling Report. May 17, 2012.

Barr, 2013. Site Characterization Investigation Report and Environmental System Plan, WISCO Oilfield Special Waste Landfill, Williston, North Dakota. February 2013.

Barr, 2024. Coal Combustion Residuals Landfill Groundwater Monitoring Well Network Certification, Antelope Valley Station Landfill. June 2024.

Terracon, 2020. Tests of Soils – Permeability, AVS Landfill Expansion, October 12, 2020.

United States Environmental Protection Agency (USEPA), 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. March 2009.

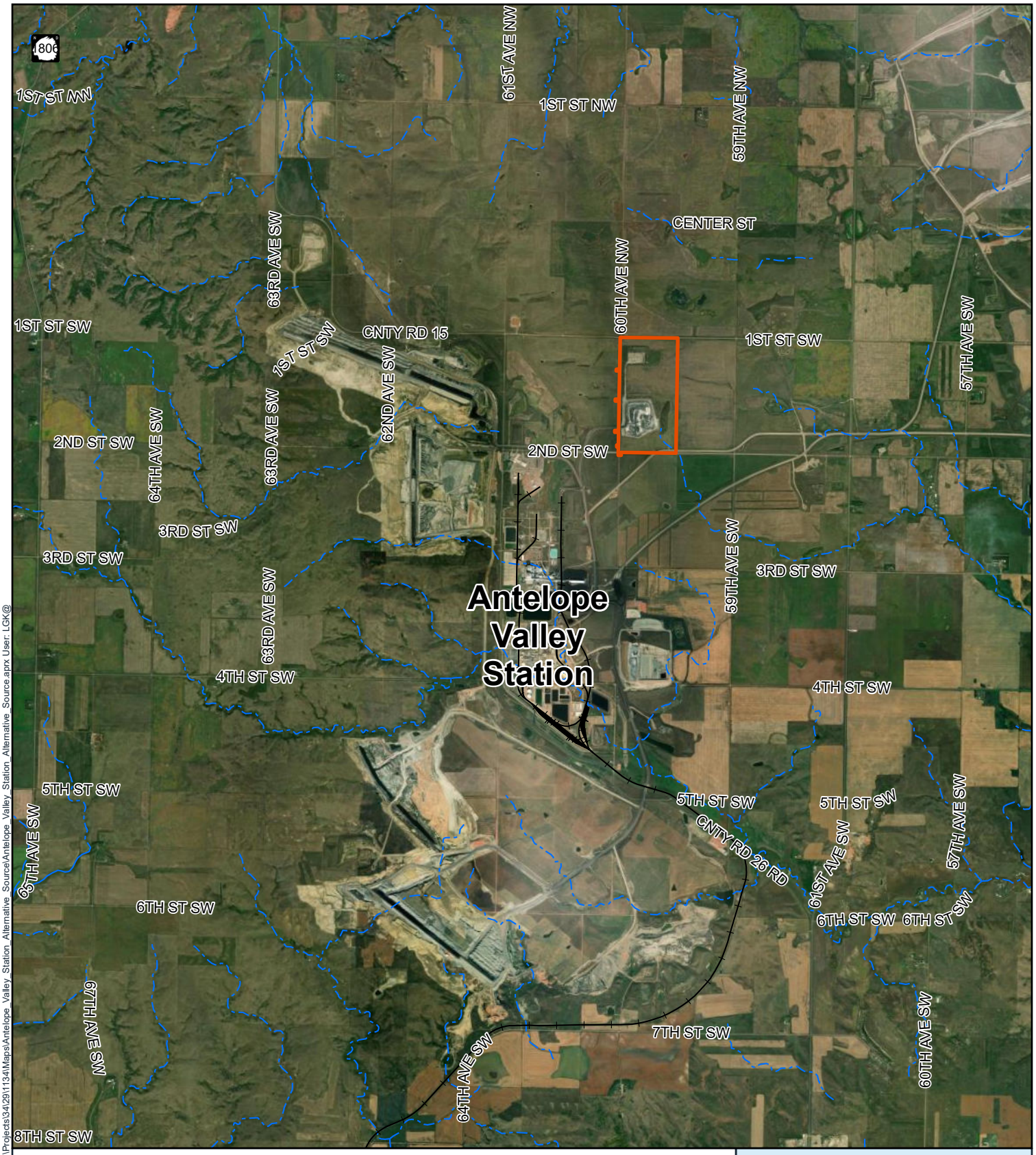
5 Certification

I certify that the written demonstration provided (above) for chloride in monitoring wells MW-16S, MW-20S, MW-24S, MW-25S, MW-26S, and MW-27S is supported by the data, accurate, and consistent with our review of the groundwater data collected to date and as required under the CCR Rule ((§ 257.94(e)(2)). 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.

Kevin Solie, P.E.
ND P.E. License No. 9488
Barr Engineering Company

Dated this 3rd day of January 2025

Figures



Permit Boundary
Stream, Intermittent
Stream, Perennial
Railroad

N

0 2,500 5,000
Feet

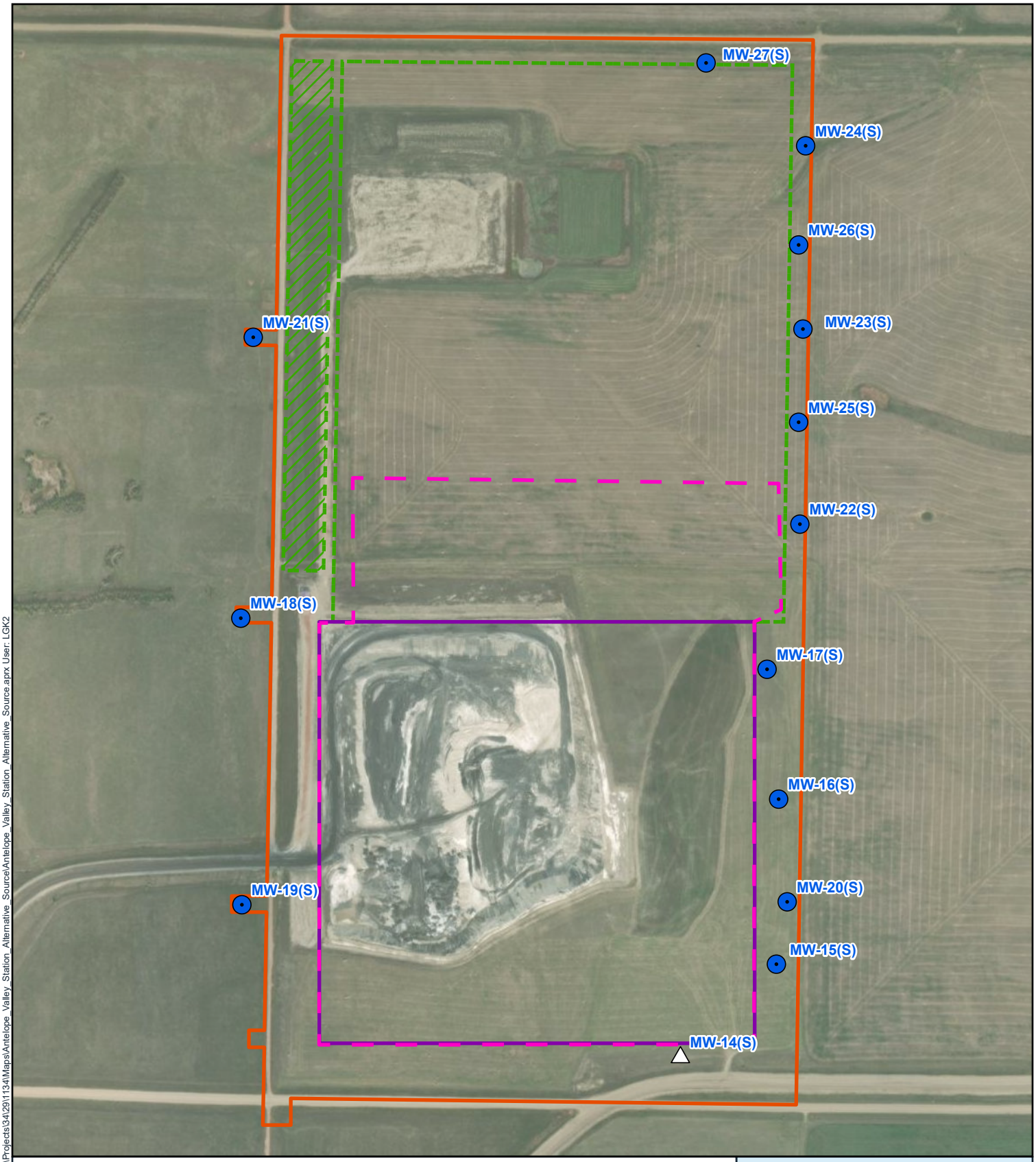
Imagery: ESRI 2024

SITE LOCATION
Alternative Source Demonstration
Antelope Valley Station Landfill
Mercer County, North Dakota

FIGURE 1

BARR

Barr footer: ArcGIS Pro 3.3.1, 2024-12-16, 12:57, File: I:\Projects\34\29\11\34\Maps\Antelope_Valley_Station_Alternative_Source\Antelope_Valley_Station_Alternative_Source.aprx User: LGK@



- Groundwater Monitoring System Wells
- Water Level Only Monitoring
- Permit Boundary
- Existing Landfill Limits
- Landfill Limits Expansion
- Leachate Management Area
- Limits of Ash (Approximate)

N

0 300 600

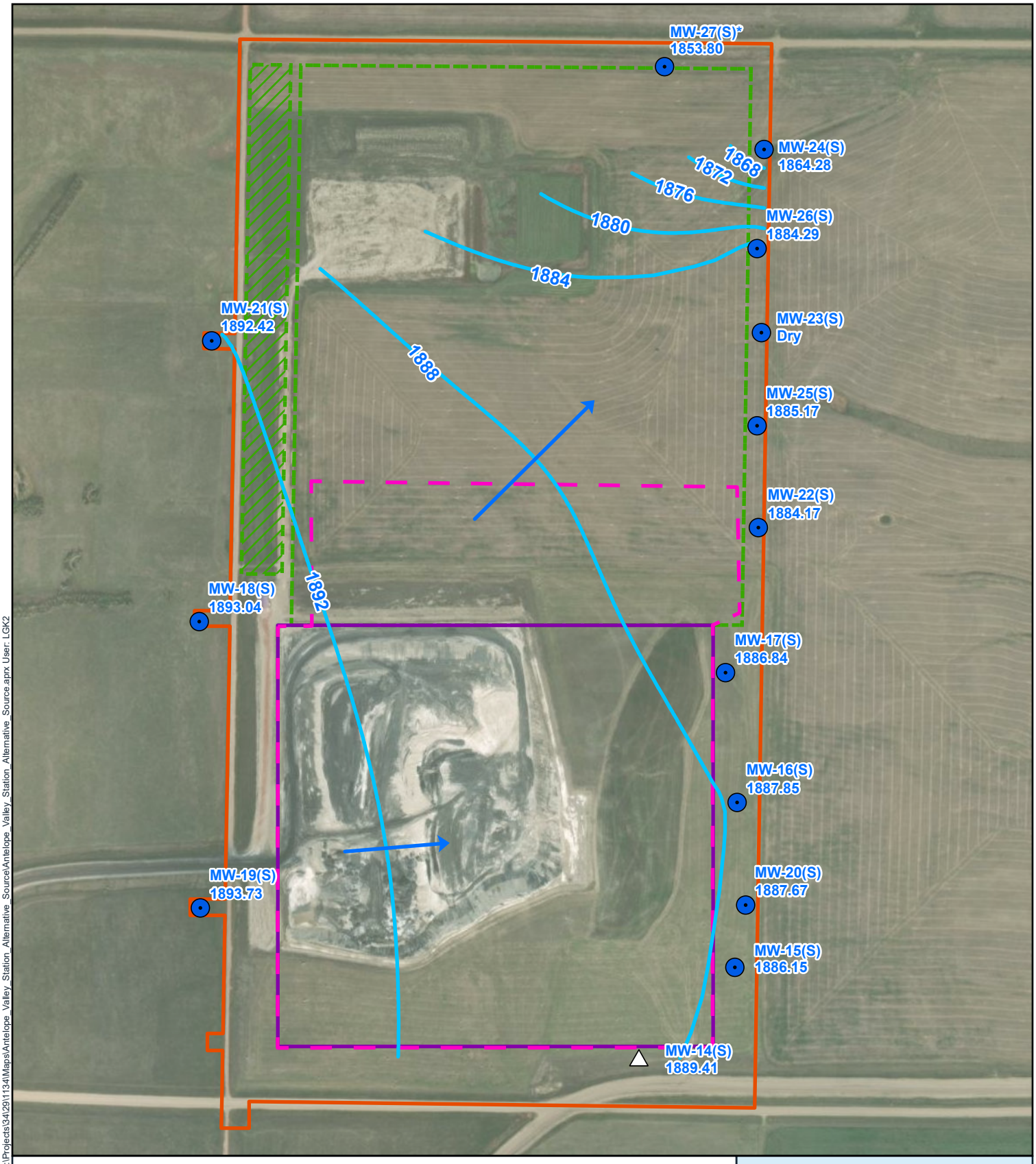
Feet

Imagery: ESRI 2024

MONITORING NETWORK
Alternative Source Demonstration
Antelope Valley Station Landfill
Mercer County, North Dakota

FIGURE 2

BARR



- Groundwater Monitoring System Wells
- Water Level Only Monitoring
- Permit Boundary
- Existing Landfill Limits
- Landfill Limits Expansion
- Leachate Management Area
- Limits of Ash (Approximate)
- Flow Direction
- Groundwater Contours

N

0 300 600

Feet

Imagery: ESRI 2024

**not used for contours because water elevations have not fully stabilized*

June 2024
Potentiometric Surface
Alternative Source Demonstration
Antelope Valley Station Landfill
Mercer County, North Dakota

FIGURE 3

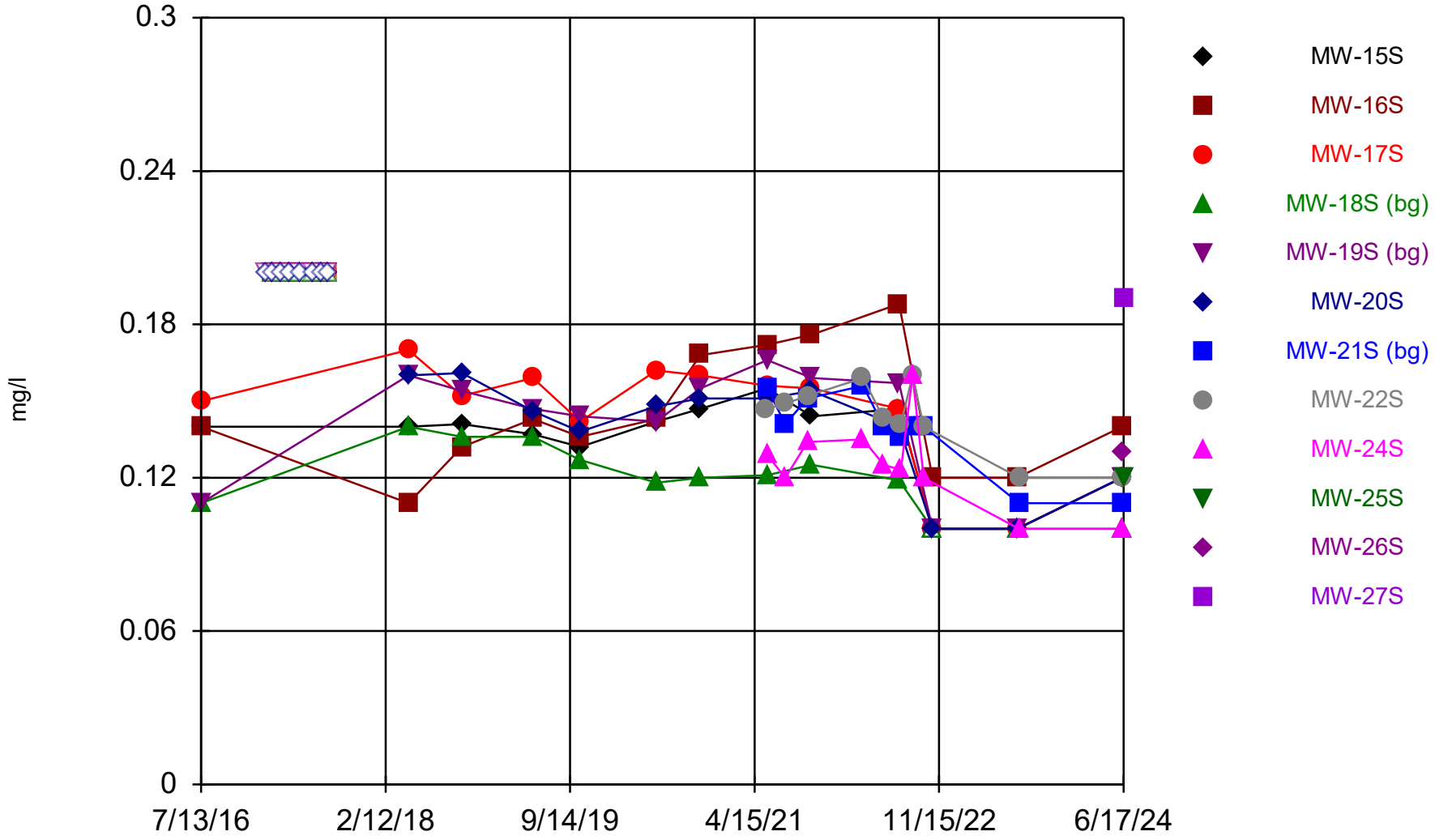
BARR

Attachment A

Time Series

Hollow symbols indicate censored values.

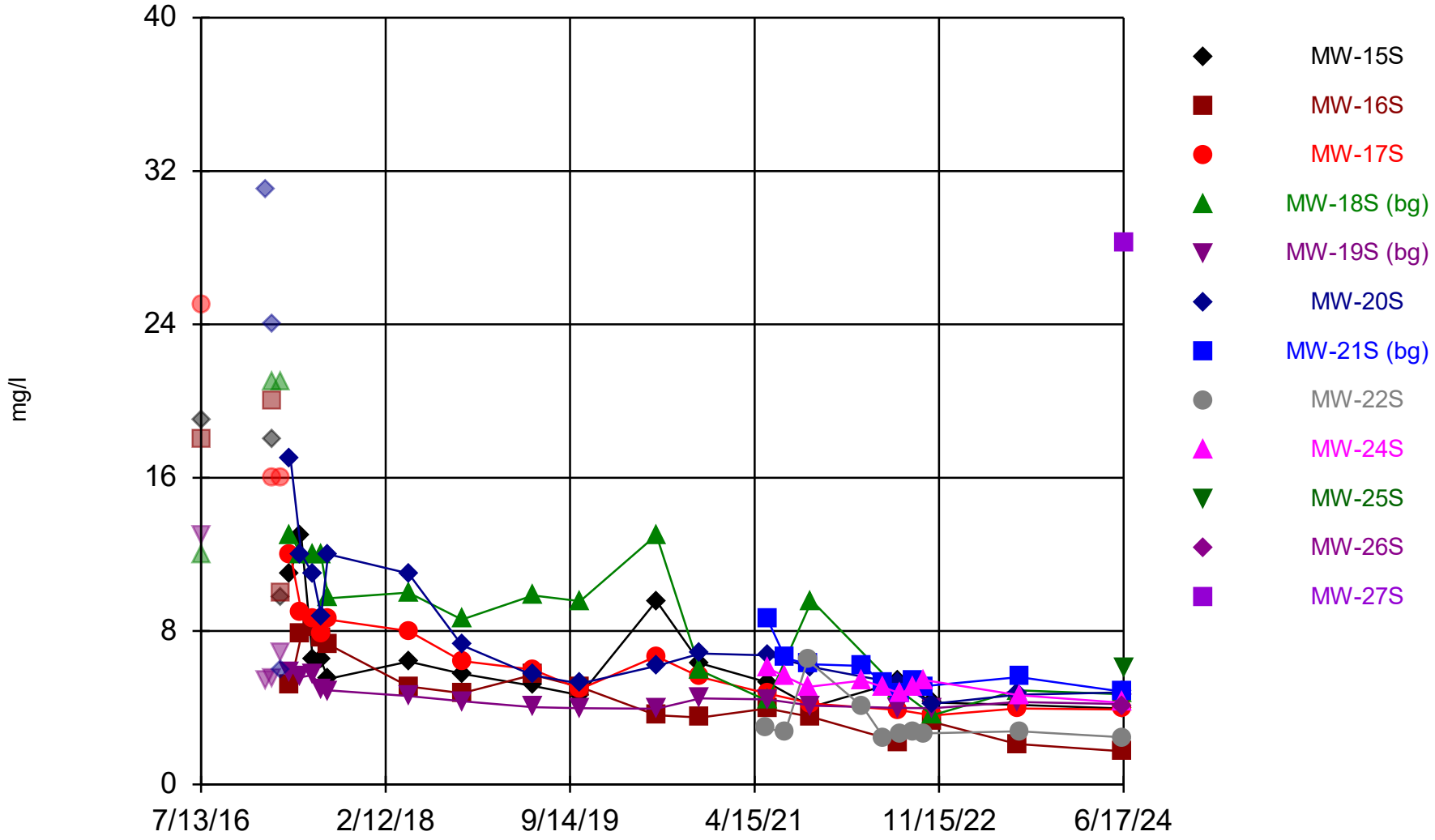
Boron, total



Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Calcium, total

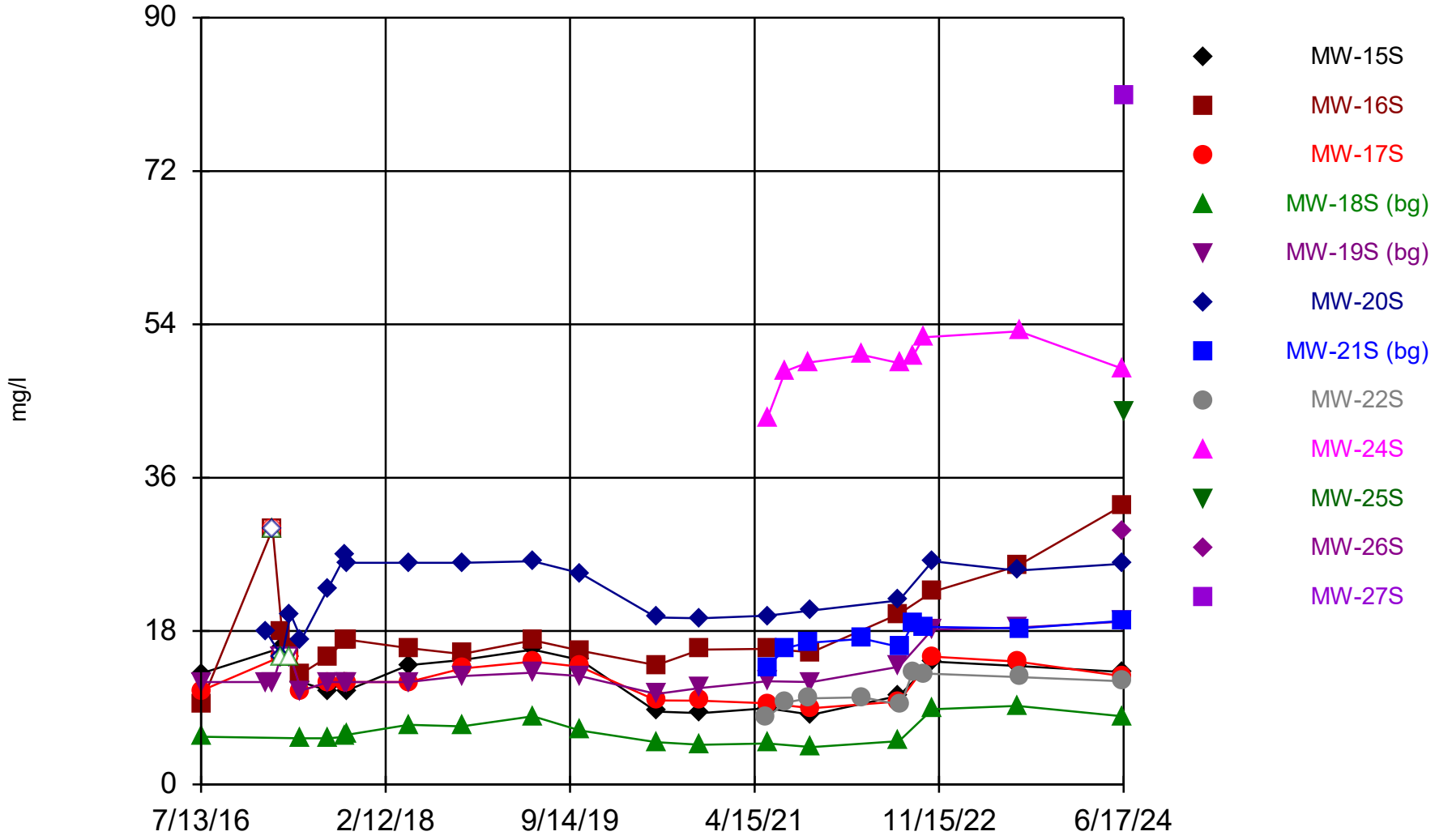


Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Hollow symbols indicate censored values.

Chloride

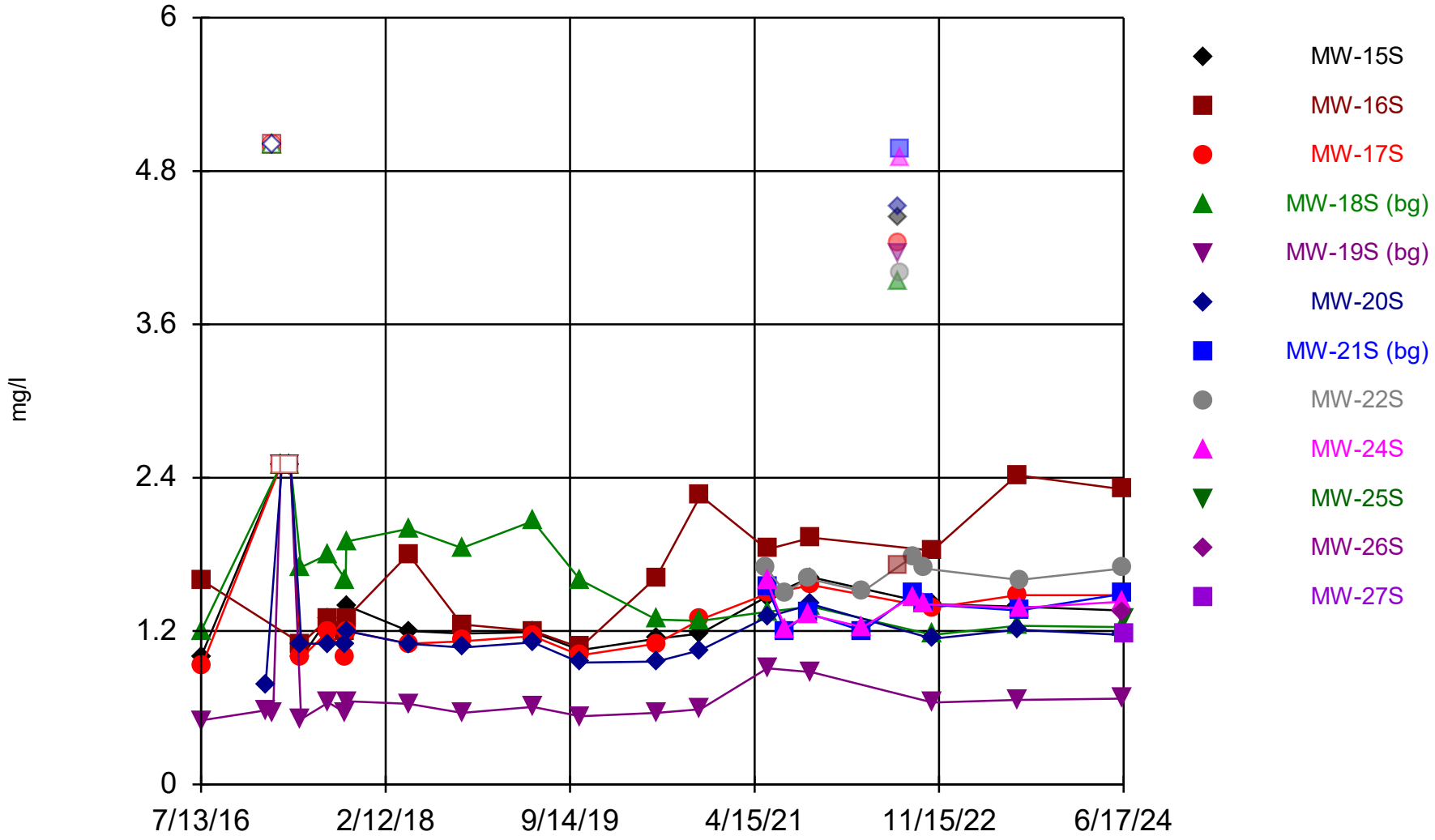


Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Hollow symbols indicate censored values.

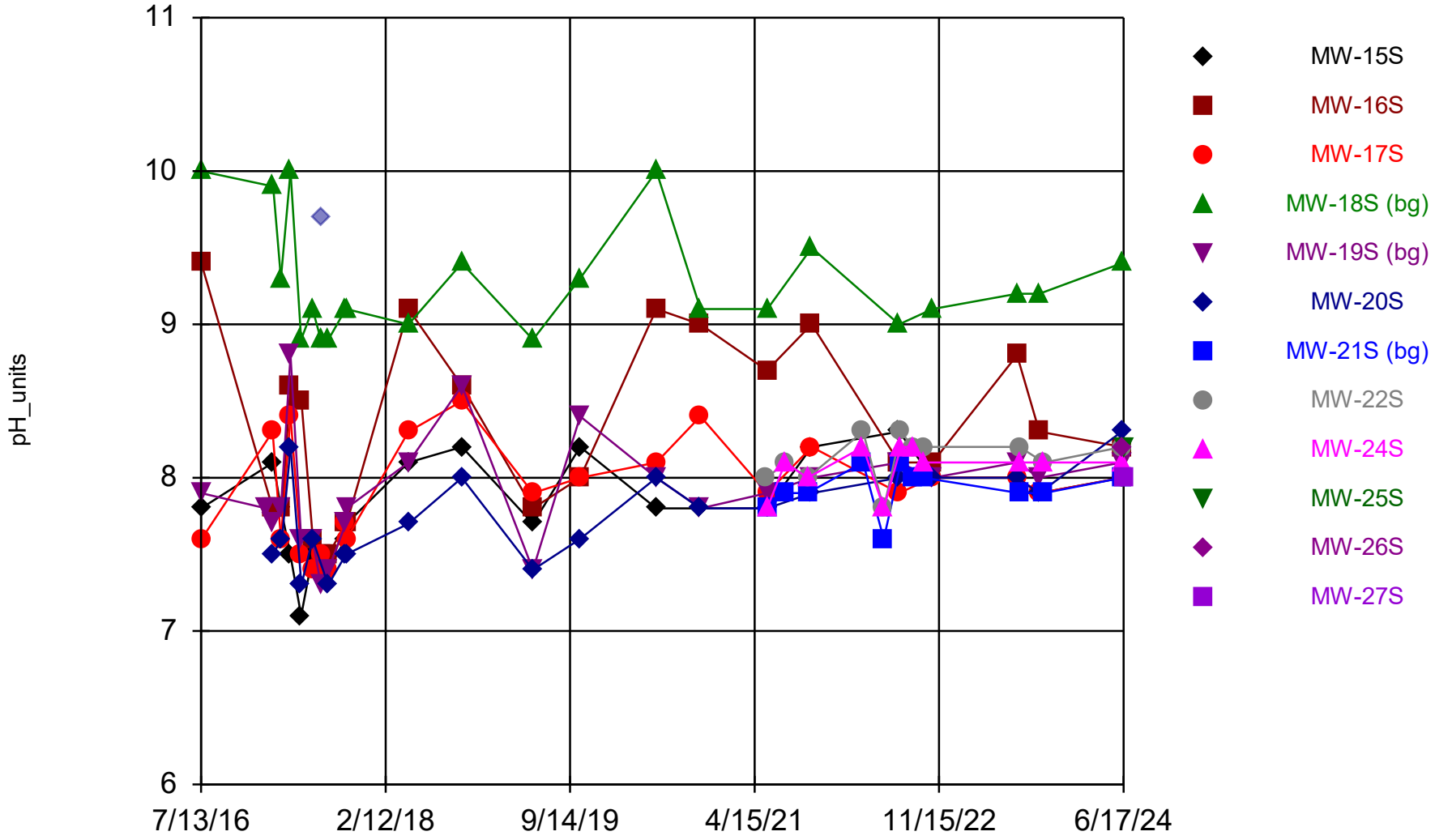
Fluoride



Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

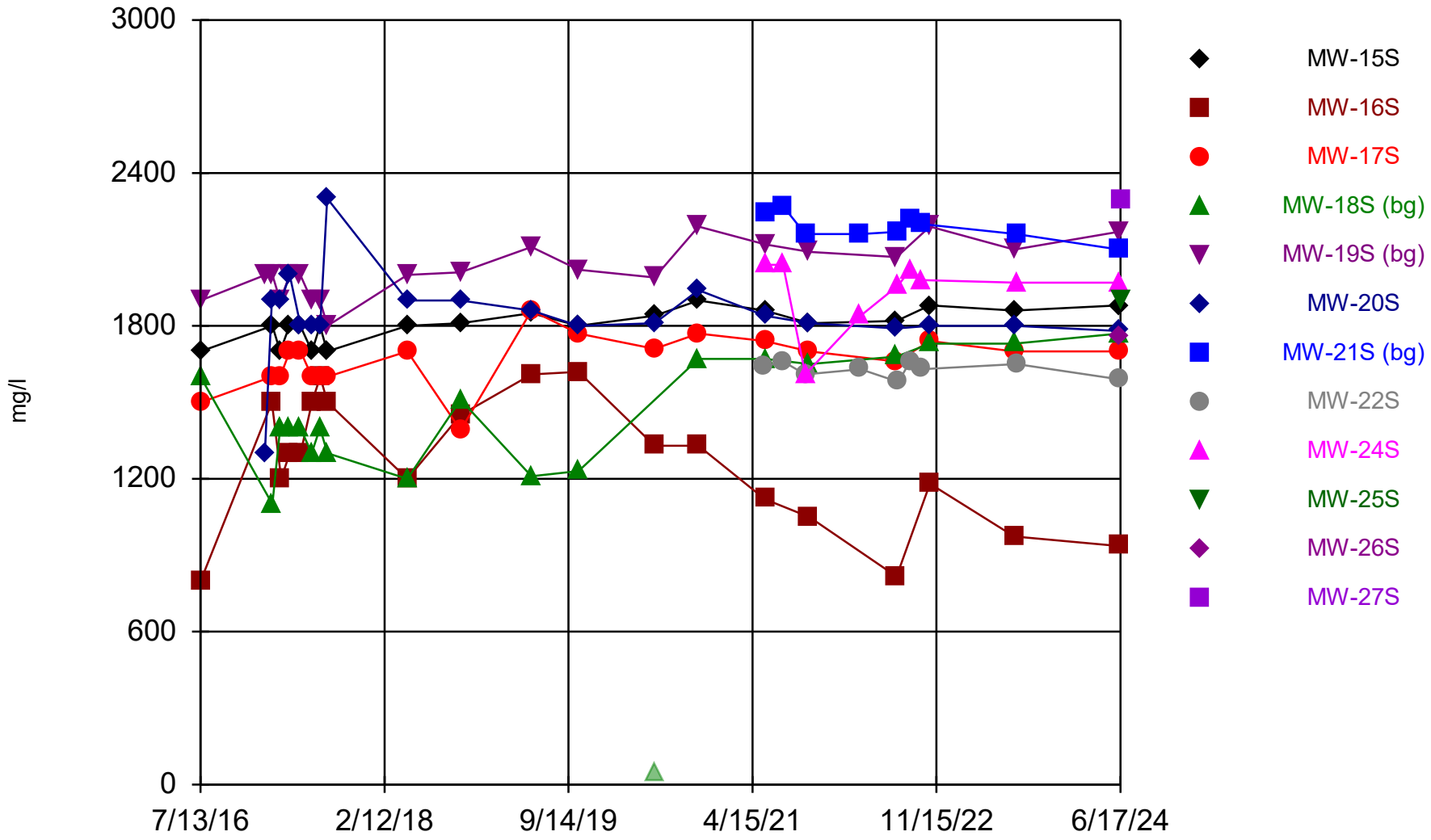
pH, field



Time Series Analysis Run 10/7/2024 8:49 AM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

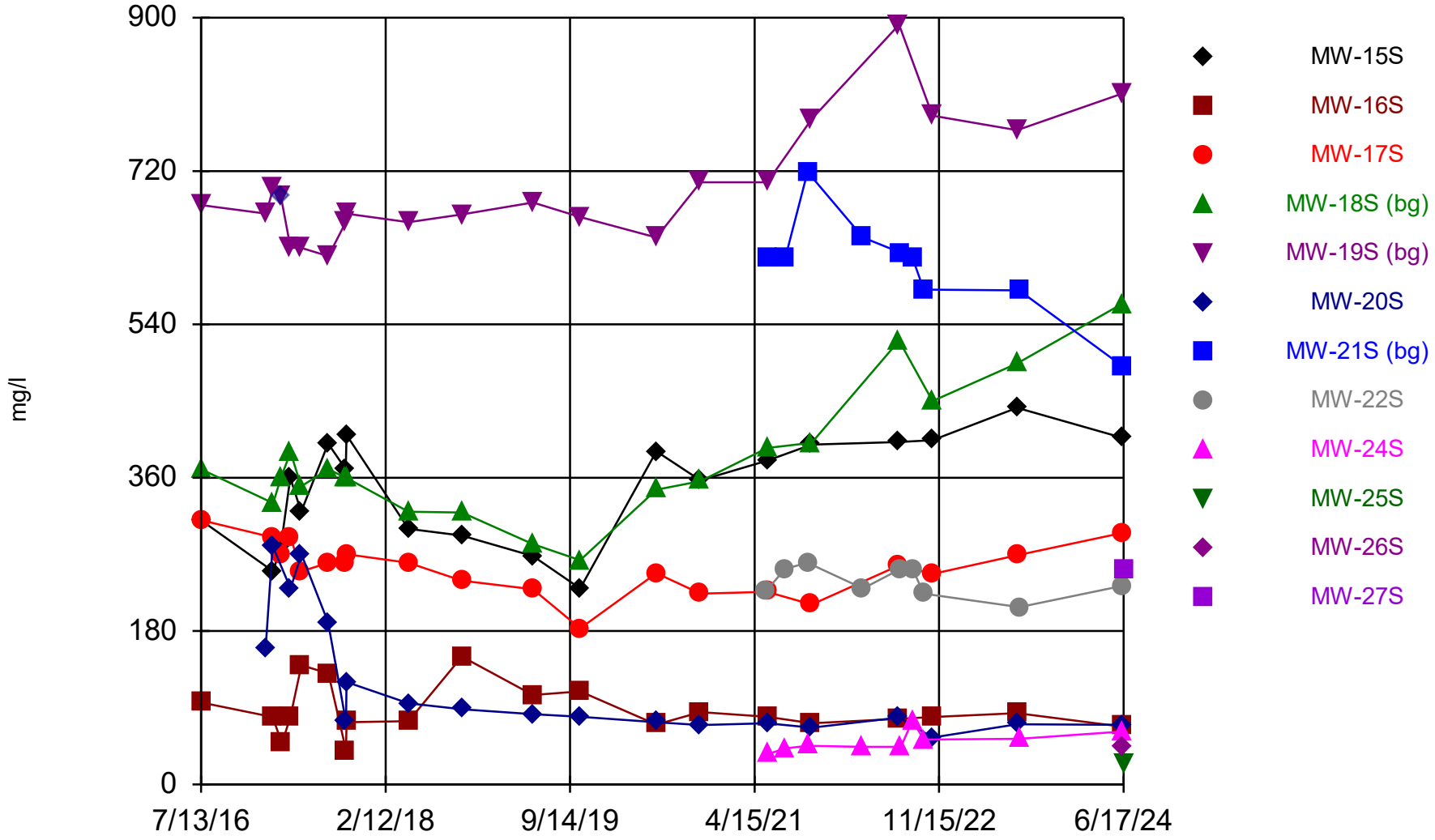
Solids, total dissolved



Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Sulfate, as SO4



Time Series Analysis Run 10/3/2024 12:43 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Attachment B

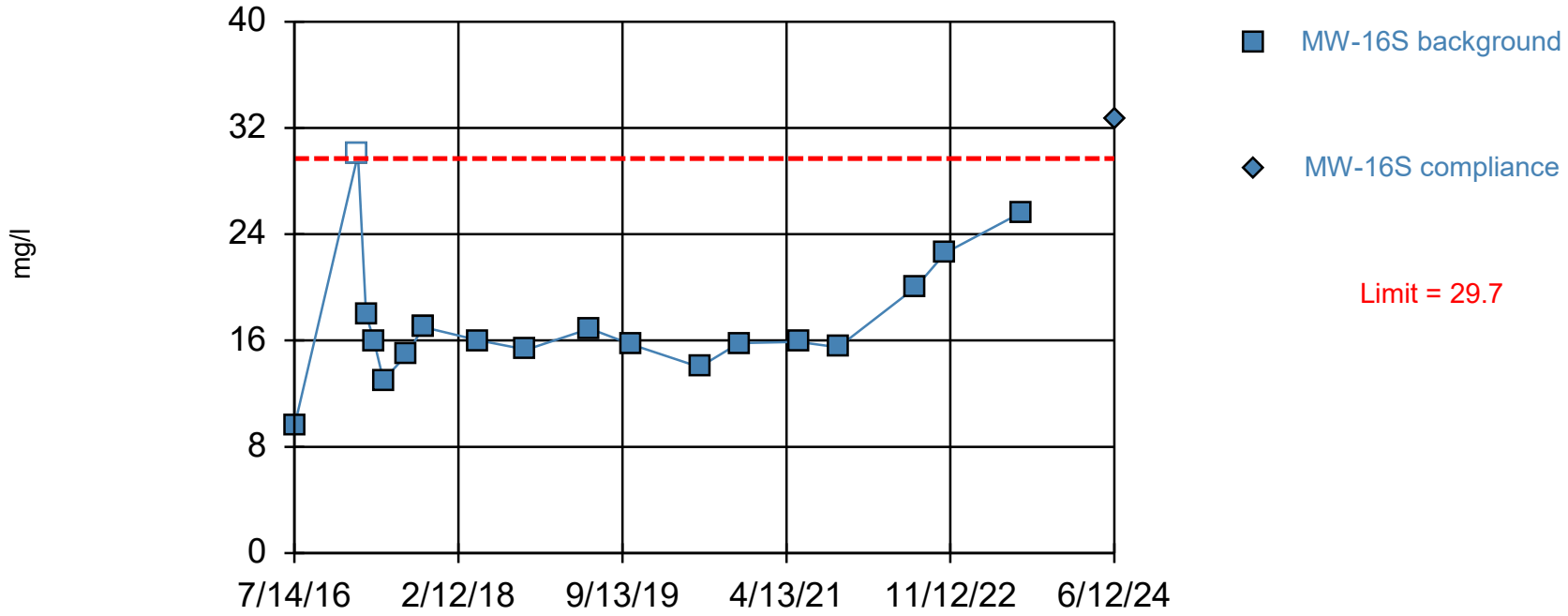
Statistical Evaluations

Hollow symbols indicate censored values.

Exceeds Limit

Chloride

Intrawell Parametric



Background Data Summary (based on natural log transformation): Mean=2.821, Std. Dev.=0.2478, n=19, 5.263% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9118, critical = 0.901. Kappa = 2.301 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523.

Prediction Limit Analysis Run 12/19/2024 4:53 PM View: AIII

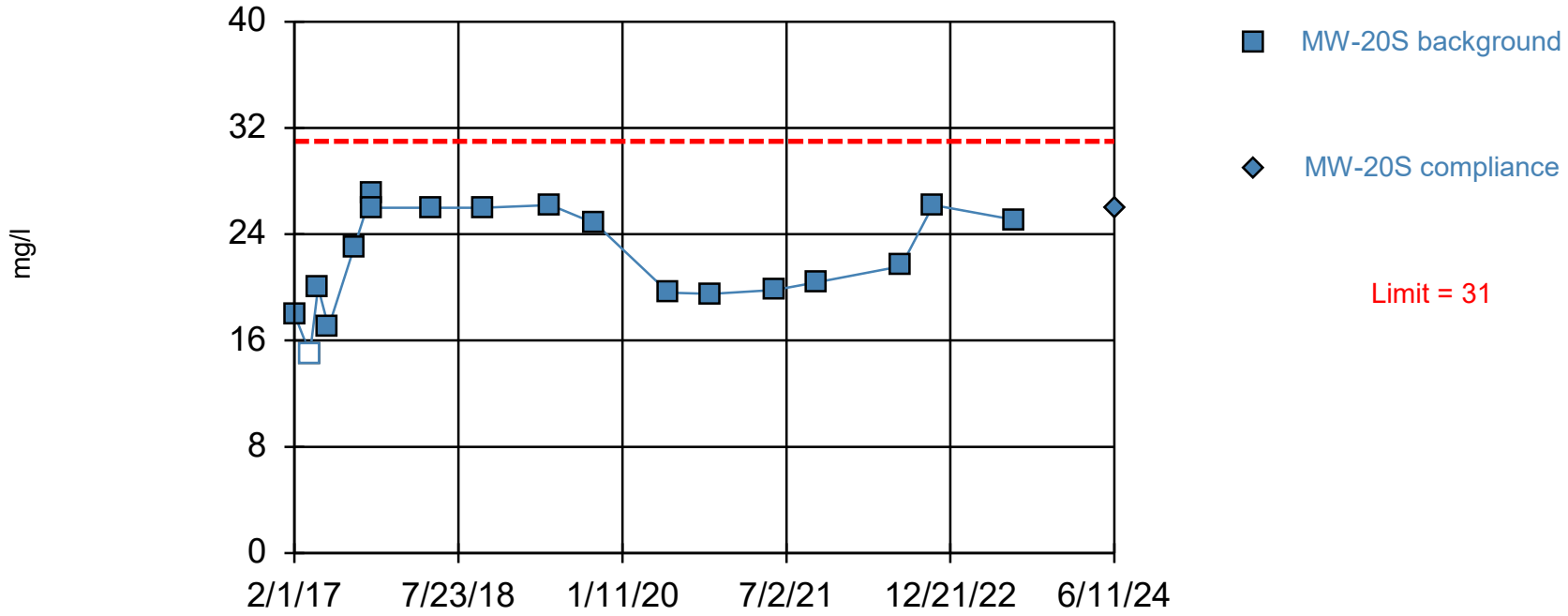
Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Hollow symbols indicate censored values.

Within Limit

Chloride

Intrawell Parametric



Background Data Summary: Mean=22.29, Std. Dev.=3.748, n=18, 5.556% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.904, critical = 0.897. Kappa = 2.33 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523.

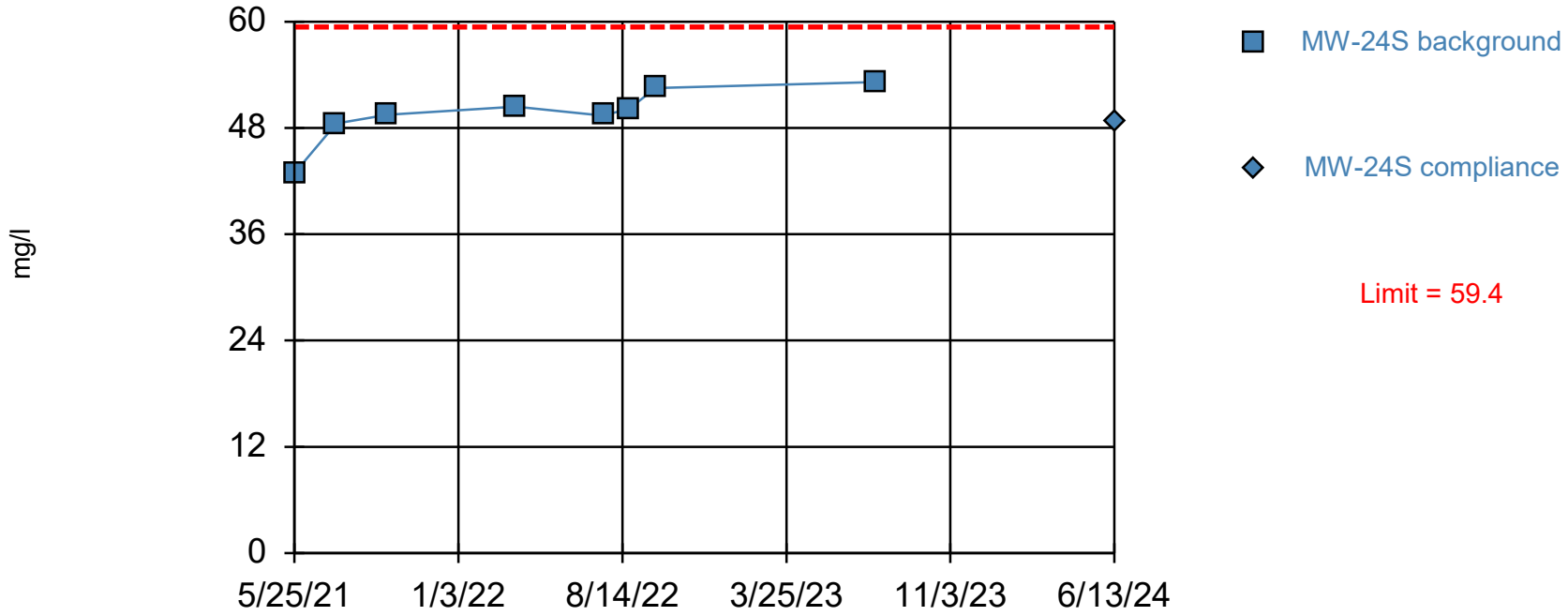
Prediction Limit Analysis Run 12/19/2024 4:53 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Within Limit

Chloride

Intrawell Parametric



Background Data Summary: Mean=49.58, Std. Dev.=3.129, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8682, critical = 0.818. Kappa = 3.133 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523.

Prediction Limit Analysis Run 12/19/2024 4:53 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Prediction Limit

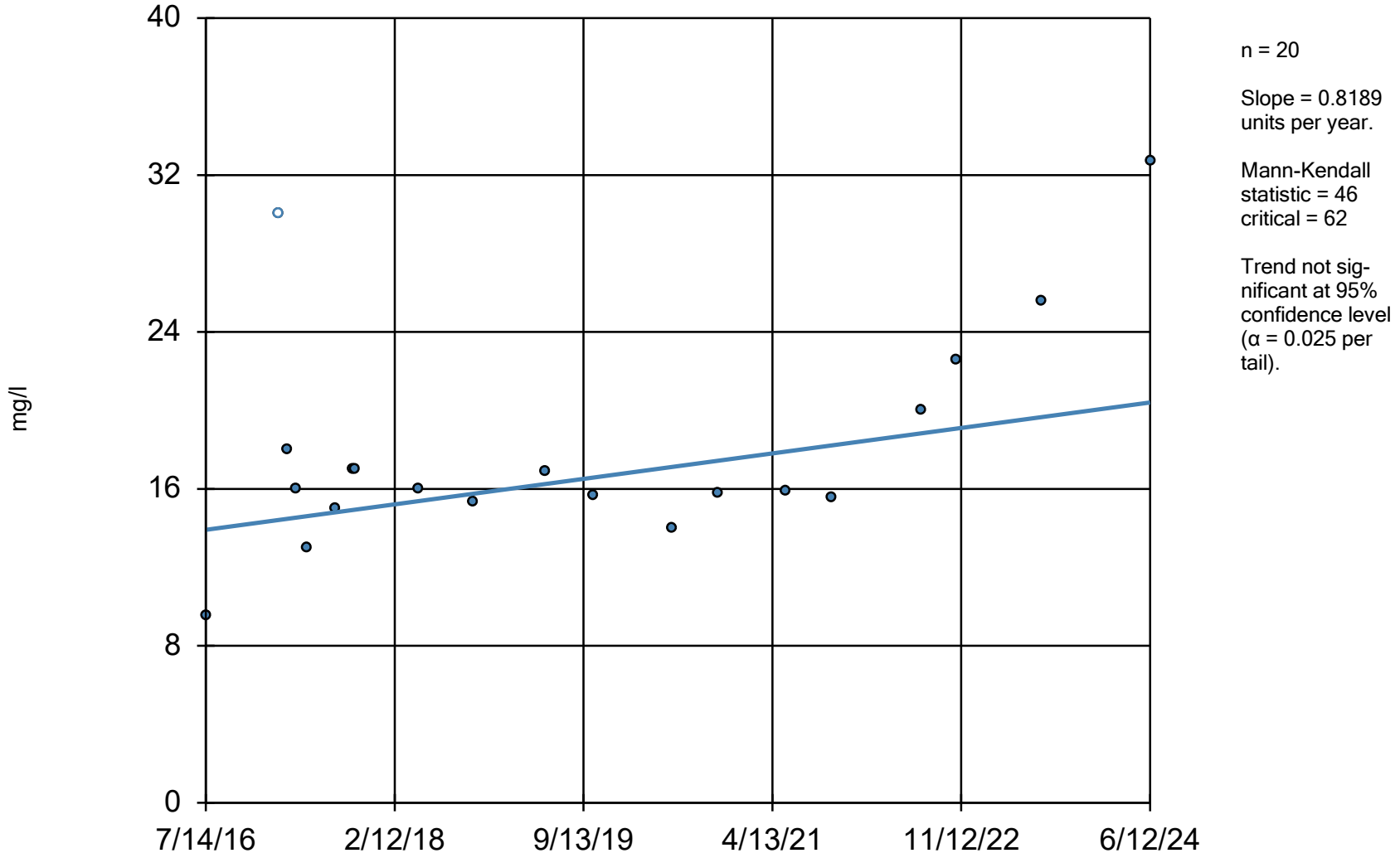
Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR Printed 12/19/2024, 4:57 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	ND Adj.	Transform	Alpha	Method
Chloride (mg/l)	**MW-16S**	**29.7**	**n/a**	**6/12/2024**	**32.7**	**Yes**	**19**	**5.263**	**None**	**ln(x)**	**0.0007523**	**Param Intra 1 of 2**
Chloride (mg/l)	MW-20S	31	n/a	6/11/2024	25.9	No	18	5.556	None	No	0.0007523	Param Intra 1 of 2
Chloride (mg/l)	MW-24S	59.4	n/a	6/13/2024	48.8	No	8	0	None	No	0.0007523	Param Intra 1 of 2

Hollow symbols indicate censored values.

Chloride

MW-16S



n = 20

Slope = 0.8189 units per year.

Mann-Kendall statistic = 46
critical = 62

Trend not significant at 95% confidence level (α = 0.025 per tail).

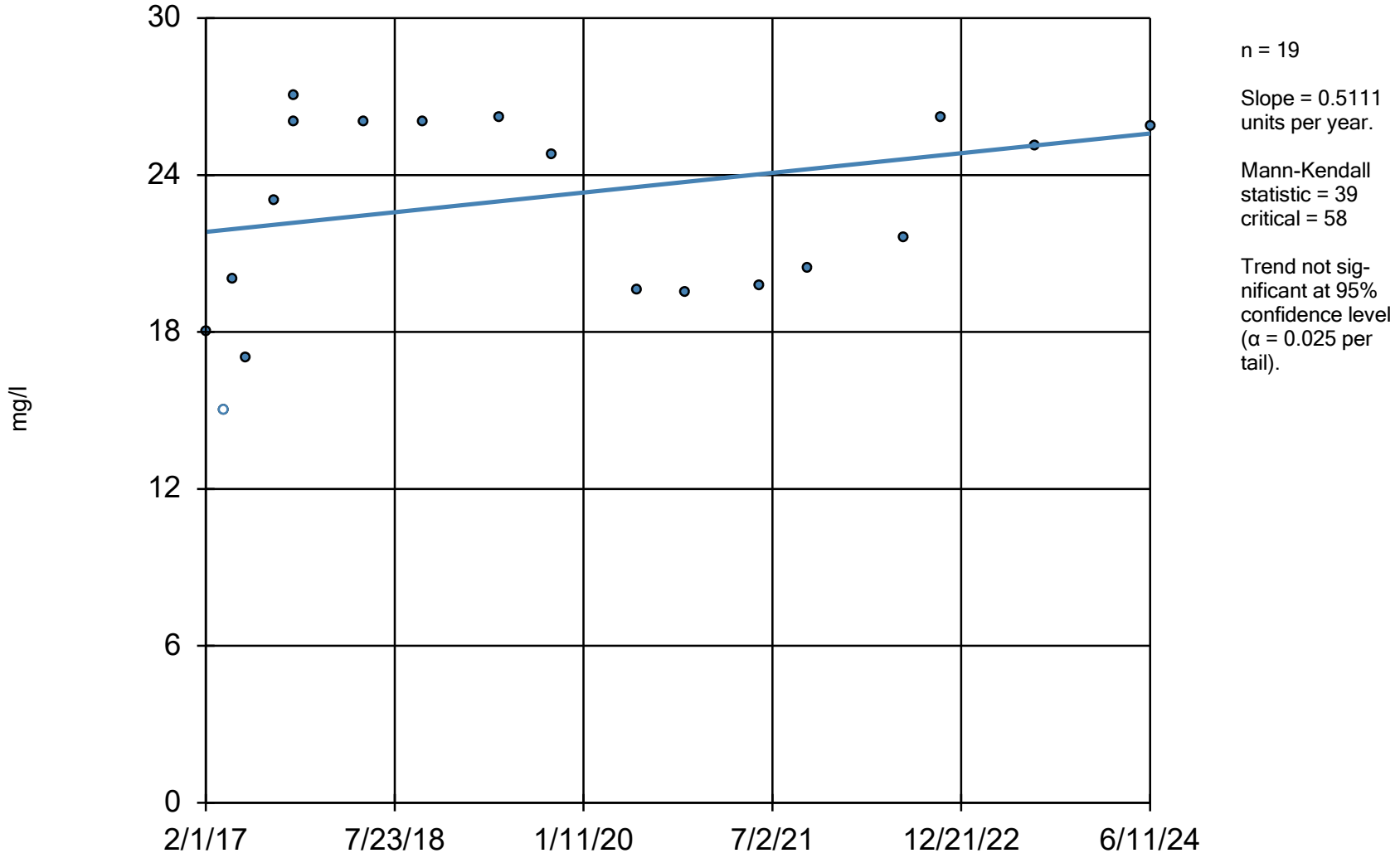
Sen's Slope and 95% Confidence Band Analysis Run 12/19/2024 4:57 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Hollow symbols indicate censored values.

Chloride

MW-20S

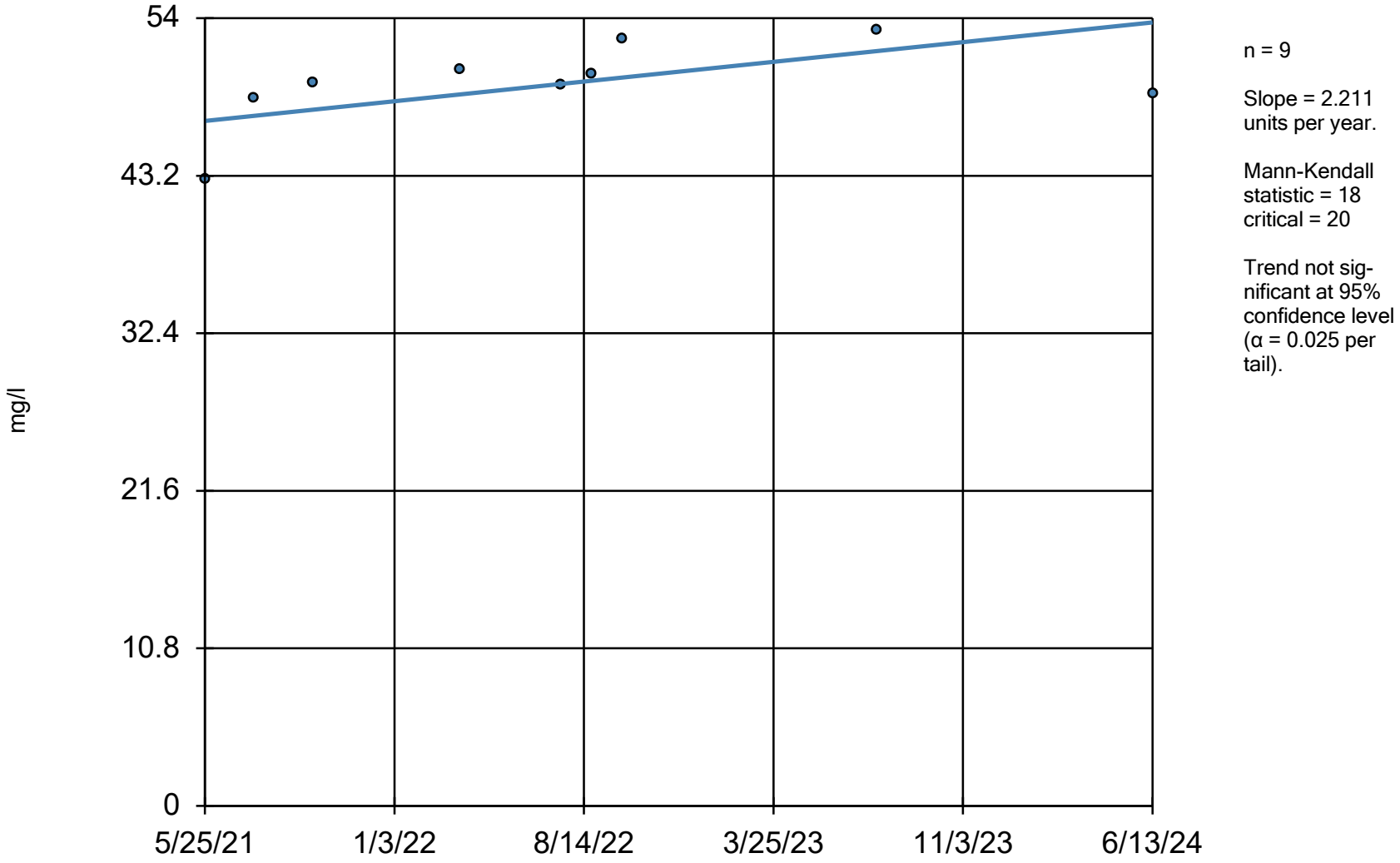


Sen's Slope and 95% Confidence Band Analysis Run 12/19/2024 4:57 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Chloride

MW-24S



n = 9

Slope = 2.211 units per year.

Mann-Kendall statistic = 18
critical = 20

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope and 95% Confidence Band Analysis Run 12/19/2024 4:57 PM View: AIII

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR

Trend Test

Antelope Valley Station Client: Basin Electric Data: BEPC_AVS_CCR Printed 12/19/2024, 4:58 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Chloride (mg/l)	MW-16S	0.8189	46	62	No	20	5	n/a	n/a	0.05	NP
Chloride (mg/l)	MW-20S	0.5111	39	58	No	19	5.263	n/a	n/a	0.05	NP
Chloride (mg/l)	MW-24S	2.211	18	20	No	9	0	n/a	n/a	0.05	NP

Attachment C

Well Sampling and Development Documentation

Barr Engineering Company
Field Log Data Sheet

Client: Basin Electric	**Monitoring Point:** MW-27
Location: AVS CCR Wells	**Date:** 4-25-2024
Project #: 34291126	**Sample Time:**

GENERAL DATA		STABILIZATION TEST						
Barr lock:	Basin			mS/cm				NTU
Casing diameter:	2"	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP Eh	mg/L D.O.	Turbidity Appearance
Total well depth:*	~229.40	1425 / 3.5 gal	13.5	2572	8.25	-96.3	0.83	Black OOR (Drk Brn)
Static water level:*	205.83							
Water depth:*	23.57							
Well volume: (gal)	3.84							
Purge method:	Bailer							
Sample method:	Bailer							
Start time:	X	Odor: None						
Stop time:	X	Purge Appearance: Dark Brown / Black						
Duration: (minutes)	X	Sample Appearance:						
Rate, gpm:		Comments: Purged dry 1 well volume "Sediment"						
Volume, purged:	~ 3.8 gal							
Duplicate collected?	NA							
Sample collection by:		CO2- Mn2- Fe(T)- Fe2-						
Others present:		Well Condition: New						

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- ~~semi-volatile-~~ general- nutrient- cyanide- DRO- Sulfide-

oil,grease- bacteria- total metal- filtered metal- methane- filter-

Others:

*Measurements are referenced from top of riser pipe, unless otherwise indicated.


E
Sample ID: MW-215
Date Collected: 6-13-24
Time Collected:
Filtered
Non-Filtered
76389

Basin Electric North Dakota

Site Name: AVS LANDFILL
Event Date: 6-10-24
Weather Conditions: WARM & SUNNY
Field Technician: mls

River Elevation (if applicable)
1657.68

Well ID	Time	Depth to Water*	Well Condition	Comments
MW - 14S	745	204.00	Good	
MW - 15S		218.62		
MW - 20S		219.80		
MW - 16S		235.74		
MW - 17S		238.05		
MW - 19S		148.83		
MW - 18S		198.56		
MW - 22S		209.73		
MW - 26S		190.21		
MW - 24S		206.46		
MW - 21S		202.30		
MW - 25S		198.23		
MW - 27S		217.80		

* Depth to water as measured from the top of PVC casing.

Well/Piezo ID: MW-155

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: warm 60° Collector(s) MK / MK

Date: 6-11-24
Time: Start 0808
Finish 1012

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 38/22 @ max psi = 70 ml

b. Water Table Depth 218.62 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
						<0.5	<5		
0941	INITIAL 4L	12.1	8.01	2991	59.6	.63	1.48	Brown	224.09
0945	4.25 L	12.1	8.05	2990	60.1	.62	1.41	↓	224.95
0949	4.35 L	12.0	8.05	2976	61.5	.60	1.53		225.20
0953	4.75 L	12.2	8.0	2974	62.0	.59	1.36		225.35
0957	5.10 L	12.4	8.04	2986	63.0	.59	1.39	↓	225.41
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1000
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Eleff Date 6-11-24

Well/Piezo ID: MW-205

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny 70° Collector(s) dc ak

Date: 6-11-24
Time: Start ~~0950~~ 1020
Finish 1032

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting _____

b. Water Table Depth 219.80 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~ hydrosleeve

b. Field Testing Equipment Used:

	Make	Model	Serial Number
	YSI		5320084101
	HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
	INITIAL	13.0	8.27	773	83.5	4.75	16.8	yellow	219.80
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

<0.5 <5

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☐	☐	☑
Have parameters stabilized	☐	☐	☑

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1025
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Schaffer Date 6-11-24

Well/Piezo ID: MW-16S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Warm 70° Collector(s) MLS

Date: 6/11/24
Time: Start 1037
Finish ~~0930~~ 0935

6-12-24

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 30/30 @ MAX PSI ~50ML

b. Water Table Depth 235.74 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L <0.5 +/- 10%	Turbidity (NTU) <5 +/- 10%	Color	DTW 0.33 ft
1124	INITIAL 2L	15.0	7.91	2291	4.8	1.03	3.93	Brown	239.41
1129	2.4 L	14.8	8.09	2201	22.0	.88	4.06	|	240.06
1134	2.8 L	14.6	8.12	2165	26.9	.76	4.94	|	240.25
1139	3 L	14.8	8.12	2165	32.3	.69	4.96	|	240.49
1144	3.4 L	15.0	8.15	2083	41.9	.61	4.00	|	240.75
1149	4 L	14.9	8.17	2019	48.5	.60	4.09	|	241.22
1154	4.5 L	14.9	8.18	1985	53.7	.61	4.16	|	241.64
1159	4.9 L	14.8	8.20	1937	57.1	.63	4.24	↓	241.99
	L								
	5.25 L	pumped down to 245ft							245.0 @ 0845
	L								
	L	15.2	9.0	1481	103.5	3.47	3.94	Brown	~~243~~.54 6/12/24 @ ~~0845~~ ~~0850~~
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☒	☐
Have parameters stabilized	☐	☒	☐

If no or N/A - Explain below.

246.21 when done

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	~~0845~~ 6/12/24
	~~250ML~~	~~1~~		~~ANIONS~~	0935
	500ML	1	HNO3	METALS	

Comments _____

Signature Myles Schettle Date 6/12/24

Well/Piezo ID: MW-[redacted]17S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: 75. Breezy Sunny
Collector(s): MK MLS
Date: 6/11/24
Time: Start 1228
Finish ~~0900~~ 1010

6-12-24

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 270
b. Water Table Depth 238.05
c. Casing Material PVC
d. Casing Diameter _____
Pump Setting 37/23 @ max psi ~100ml

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L +/- 10% (<0.5)	Turbidity (NTU) +/- 10% (<5)	Color	DTW 0.33 ft
1320	INITIAL 5L	12.9	8.02	2760	-0.8	1.11	4.76	Brown	246.00
1325	5.25 L	13.2	8.03	2753	19.5	.93	4.69		246.86
1330	5.5 L	12.9	8.01	2734	26.2	.78	4.50		247.55
1335	6 L	12.9	7.99	2737	39.1	.85	4.99		248.35
1340	6.5 L	12.8	7.98	2721	17.5	1.22	4.50		249.21
	L								
	L								
	L		pumped down to			251.1			
	L								
	L								
	L	13.2	7.91	2569	122.1	3.3	4.0	Brown	~~247.48~~
	L								
	L								
	L								247.36

6/12/24 @ 1010

6-12-24

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☒	☐
Have parameters stabilized	☐	☒	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1010
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

6-12-24

Comments _____

Signature [signature] Date 6/12/24

Well/Piezo ID: MW-19S

Ground Water Sample Collection Record

Client:	BEPC	Date:	6/12/24
Project No:		Time: Start	1025
Site Location:	AVS	Finish	1106
Weather Conds:	75 Sunny Breezy	Collector(s)	MK MLS

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length ______ c. Casing Material PVC Pump Setting 19/11 @ max PSI ~110mL

b. Water Table Depth 148.83 d. Casing Diameter ______

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	✓ DO mg/L <0.5	✓ Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
1051	INITIAL 5	10.6	8.05	3105	35.1	.30	2.98	clear	149.10
1056	5.5 L	10.4	8.05	3105	38.0	.29	3.68	↓	149.11
1101	6 L	10.3	8.06	3107	37.4	.28	1.99	↓	149.14
1106	6.5 L	10.2	8.06	3103	35.7	.24	2.08	↓	149.14
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

DUP.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1106
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments ______

Signature [signature] Date 6/12/24

Well/Piezo ID: MW-18S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Collector(s)

Date: 6-12-24
Time: Start 1210
Finish 1319

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ ☐

a. Total Well Length
b. Water Table Depth 198.56
c. Casing Material PVC
d. Casing Diameter

Pump Setting 11/19 @ max PSI ~140ML

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L <0.5	Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
1304	INITIAL 0	12.3	9.52	2558	60.0	.34	4.79	yellow	199.36
1309	7 L	12.2	9.47	2579	61.4	.31	4.48	↓	199.20
1314	8 L	12.2	9.42	2585	60.1	.32	4.74		199.39
1319	9 L	12.0	9.37	2608	54.2	.32	4.57		199.31
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1319
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments

Signature Myla Schuetz Date 10/12/24

Well/Piezo ID: MW-22S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: warm 65° Collector(s) mk

Date: 6/13/24
Time: Start 0820
Finish 0920

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 41/17 @ max PSI ~ 60mls

b. Water Table Depth 209.73 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L <0.5 +/- 10%	Turbidity (NTU) <5 +/- 10%	Color	DTW 0.33 ft
0855	INITIAL 4.5	10.8	8.18	2438	1.6	.47	6.74	yellow	210.1
0858	5 L	10.7	8.18	2411	1.0	.45	6.99	Brown	210.1
0901	5.5 L	10.8	8.18	2436	-0.3	.42	7.14	↓	210.1
0904	6 L	10.8	8.17	2433	-1.7	.39	6.20		210.2
0907	6.5 L	11.7	8.18	2427	-2.7	.42	5.94		210.21
0910	7 L	11.6	8.18	2440	-2.7	.40	5.53		210.0
0913	7.5 L	11.5	8.18	2450	-2.5	.43	5.39	↓	209.98
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	0913
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	

Comments _____

Signature Mike Schott Date 6-13-24

Well/Piezo ID: MW 26S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Warm 70° Collector(s) MS AK

Date: 6.13.24
Time: Start 0955
Finish 1093

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 248
b. Water Table Depth 190.21
c. Casing Material PVC
d. Casing Diameter

Pump Setting 39/21 ~ 150mL @ max PSI
38/22 ~ 175mL

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump
b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO mg/L (<0.5) +/- 10%	Turbidity (NTU) (<5) +/- 10%	Color	DTW 0.33 ft
1004	INITIAL						D	Brown	193.30 – first pump
1006	L								193.1
1013	L						102	Mud	193.26
1040	5.5 L	11.4	8.15	2667	-35.8	.30	38.2		193.0
1043	6.5 L	11.2	8.15	2668	-38.1	.31	37.8		193.0 –
1046	7 L	10.9	8.15	2673	-40.7	.32	31.7		192.85
1049	7.5 L	11	8.15	2681	-41.1	.33	29.6		193.04
1052	8 L	11.1	8.15	2665	-41.6	.33	28.7		192.83 –
1055	8.5 L	10.9	8.15	2665	-43.2	.35	27.9		193.1 – during sampling
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	~~1055~~
	1gal	1		Radium	1052

Comments

Signature Myles Schultz Date 6/13/24

Well/Piezo ID: MW-24S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny Breezy 70 Collector(s) MK MW

Date: 6/13/24
Time: Start 1115
Finish 1212

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 6/14 @ max psi ~100mL

b. Water Table Depth 206.46 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO ✓ mg/L (<0.5) +/- 10%	Turbidity (NTU) (<5) +/- 10%	Color	DTW 0.33 ft
1155	INITIAL 4.5 L	10	8.12	2994	19.	.32	8.45	yellow	208.0
1158	5 L	10	8.12	2998	20.7	.29	8.26	brown	208
1201	5.5 L	10	8.12	2999	22.7	.35	8.58	↓	208.02
1203	6 L	10.1	8.13	3006	23.8	.54	8.74	↓	208.1
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
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	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

DUP.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1203
	~~250ML~~	~~1~~		~~ANIONS~~	↓
	500ML	1	HNO3	METALS	

Comments _____

Signature Myla Schuett Date 6/13/24

Well/Piezo ID: MW.21S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Sunny Breezy 70 Collector(s) MK MLS

Date: 6/13/24
Time: Start 1305
Finish 1449

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting 38/22 c max PSI ~150mL

b. Water Table Depth 202.30 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time / Stabilization	Volume Removed (gal)	T° (C) +/- 0.2	pH +/- 0.1	Spec. Cond (µs/cm) +/- 3%	ORP +/- 10%	DO ✓ mg/L <0.5 +/- 10%	Turbidity ✓ (NTU) <5 +/- 10%	Color	DTW 0.33 ft
1342	INITIAL 5	12.3	8.00	3133	-89.0	.316	3.89	Brown	209.84
1346	5.25 L	12.5	7.99	3109	-80.7	.33	4.35		210.71
1350	5.5 L	13.2	7.93	3121	-67.2	.31	2.94		210.95
1354	10 L	14	7.96	2769	-44.9	.34	2.79		211.40
1358	6.25 L	14.1	7.94	2764	-35.1	.34	2.79		211.71
1400	6.5 L	14.2	7.94	2765	-26.0	.23	2.93		211.99
1404	6.75 L	14	7.94	3122	-16.7	.35	3.11		212.25
1408	7.0 L	14	7.96	3107	-10.8	.37	2.78		212.69
1412	7.25 L	14	7.96	3105	-3.5	.41	3.10		212.90
1416	7.5 L	14	7.95	2.108	1.9	.44	3.13		213.42
1420	8 L	14.1	7.96	3113	5.6	.44	2.79		213.74
1424	8.25 L	14.1	7.96	3117	11.4	.45	4.75		213.95
1428	8.5 L	14.1	7.97	3097	12.5	.32	3.73		214.25
1431	8.75 L	14.2	7.98	3106	13.2	.47	3.64	↓	214.54

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1431
	~~250ML~~	~~4~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	↓

Comments _____

Signature Myles Schettler Date 6/13/24

Well/Piezo ID: MW-25s

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Cloudy 63° Collector(s) MS/AK

Date: 6-17-24
Time: Start 0810
Finish 0920

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length 213 c. Casing Material PVC Pump Setting

b. Water Table Depth 198.23 d. Casing Diameter

WELL PURGING DATA

a. Purge Method Dedicated Bladder Pump

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L <0.5	Turbidity (NTU) <5	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
0909	INITIAL 6L	9.3	8.13	2883	141.2	.51	43	Brwn	199.18
0912	6.1L	9.3	8.16	2888	3	.51	44.6	↓	199.95
0915	6.3L	9.3	8.17	2891	.4	.50	41.7	↓	199.90
0918	6.5L	9.3	8.18	2889	-3	.49	39.7	↓	199.91
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

Dup.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	0920
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	
	1 gal	1		Radium	

Comments

Signature

Date 6-17-24

Well/Piezo ID: MW-27S

Ground Water Sample Collection Record

Client: BEPC
Project No:
Site Location: AVS
Weather Conds: Cloudy 65° Collector(s) MH/HK

Date: 6-17-24
Time: Start 1010
Finish 1040

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ ☐

a. Total Well Length _____ c. Casing Material PVC Pump Setting Hydrosleeve

b. Water Table Depth 217.80 d. Casing Diameter _____

WELL PURGING DATA

a. Purge Method ~~Dedicated Bladder Pump~~

b. Field Testing Equipment Used:

Make	Model	Serial Number
YSI		5320084101
HACH		20030C084551

c. Field Testing Equipment Calibration Documentation Found in Field Notebook # 1 Page # 1

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW
Stabilization		+/- 0.2	+/- 0.1	+/- 3%	+/- 10%	+/- 10%	+/- 10%		0.33 ft
						<0.5	<5		
1010	INITIAL	8.5	8.03	3016	123.4	3.45	570	Black	217.80
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								
	L								

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Typ	No. of Containers	Preservation	Analysis	Time
	1L	1		TDS	1040
	~~250ML~~	~~1~~		~~ANIONS~~	
	500ML	1	HNO3	METALS	
	1GAL.	1	HNO3	Radium	

Comments _____

Signature _____ Date 6-17-24

Calibration Log YSI						Hach
Date/Time		pH	ORP	Conductivity	DO	Verify
4-15-24	0710	✓	✓	✓	✓	✓
5-13-24	1010	✓	✓	✓	✓	✓
5-14-24	0730	✓	✓	✓	✓	✓
5-21-24	0715	✓	✓	✓	✓	✓
5-22-24	0648	✓	✓	✓	✓	✓
6-1-24	0800	✓	✓	✓	✓	✓
6-12-24	0830	✓	✓	✓	✓	✓
6-13-24	0820	✓	✓	✓	✓	✓
6-17-24	0815	✓	✓	✓	✓	✓
6-25-24	0730	✓	✓	✓	✓	✓
8-1-24	0715	✓	✓	✓	✓	✓
8-16-24	0720	✓	✓	✓	✓	✓
9-10-24	0700	✓	✓	✓	✓	✓
9-11-24	0700	✓	✓	✓	✓	✓
9-17-24	0705	✓	✓	✓	✓	✓
10-1-24	0703	✓	✓	✓	✓	✓
10-2-24	0701	✓	✓	✓	✓	✓

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

Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coope
WO: 51646

Chain of Custody

Page __1___ of __1___

Work Order # (Lab Use Only)

Company Name and Address: Basin Electric Power Coop. / Leland Olds Station / 3901 Highway 200A / Stanton, ND 58571	Account # 2040
Billing Address (indicate if different from above): Attn: Liabilities	Phone # 701-745-7238 701-557-5488
	Contact: Mark Dihle
	Emails: mdihle@bepc.com aknutson@bepc.com
	Name of Sampler: Myles Shettler
	Ksolie@barr.com
	Quote Number
	Date Submitted: 6/13/2024
	Project Name/Number: AVS Landfill
	Purchase Order #: 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix (GW - Groundwater)	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW-15s	GW	6/11/2024	1000	2	N	B,Ca,Cl,F,SO4,TDS
002	MW-20s	GW	6/11/2024	1025	2	N	B,Ca,Cl,F,SO4,TDS
003	MW-16s	GW	6/12/2024	935	2	N	B,Ca,Cl,F,SO4,TDS
004	MW-17s	GW	6/12/2024	1010	2	N	B,Ca,Cl,F,SO4,TDS
005	MW-19s	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS
006	MW-18s	GW	6/12/2024	1319	2	N	B,Ca,Cl,F,SO4,TDS
007	AVS Leachate	SW	6/11/2024	1405	2	N	B,Ca,Cl,F,SO4,TDS
008	LOS Leachate	SW	6/12/2024	745	2	N	B,Ca,Cl,F,SO4,TDS
009	Duplicate	GW	6/12/2024	1106	2	N	B,Ca,Cl,F,SO4,TDS

Comments:

	Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
1.				[illegible]	13Jun24	1504	2.1C	(Y) / N	TN480
2.								Y / N	

Report Date: Wednesday, July 3, 2024 10:09:37 AM

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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www.MVTL.com

Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Basin Electric Power Coop
WO: 51753

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
Billing Address (indicate if different from above)	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
	Quote Number	Date Submitted 6/14/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 26 S	GW	6/13/2024	1052	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 22 S	GW	6/13/2024	913	2	N	B, Ca, Cl, F, SO_4, TDS
003	MW 24 S	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
004	DUP	GW	6/13/2024	1203	2	N	B, Ca, Cl, F, SO_4, TDS
005	MW 21 S	GW	6/13/2024	1431	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/14/2024			14Jun24	14:51	4.5°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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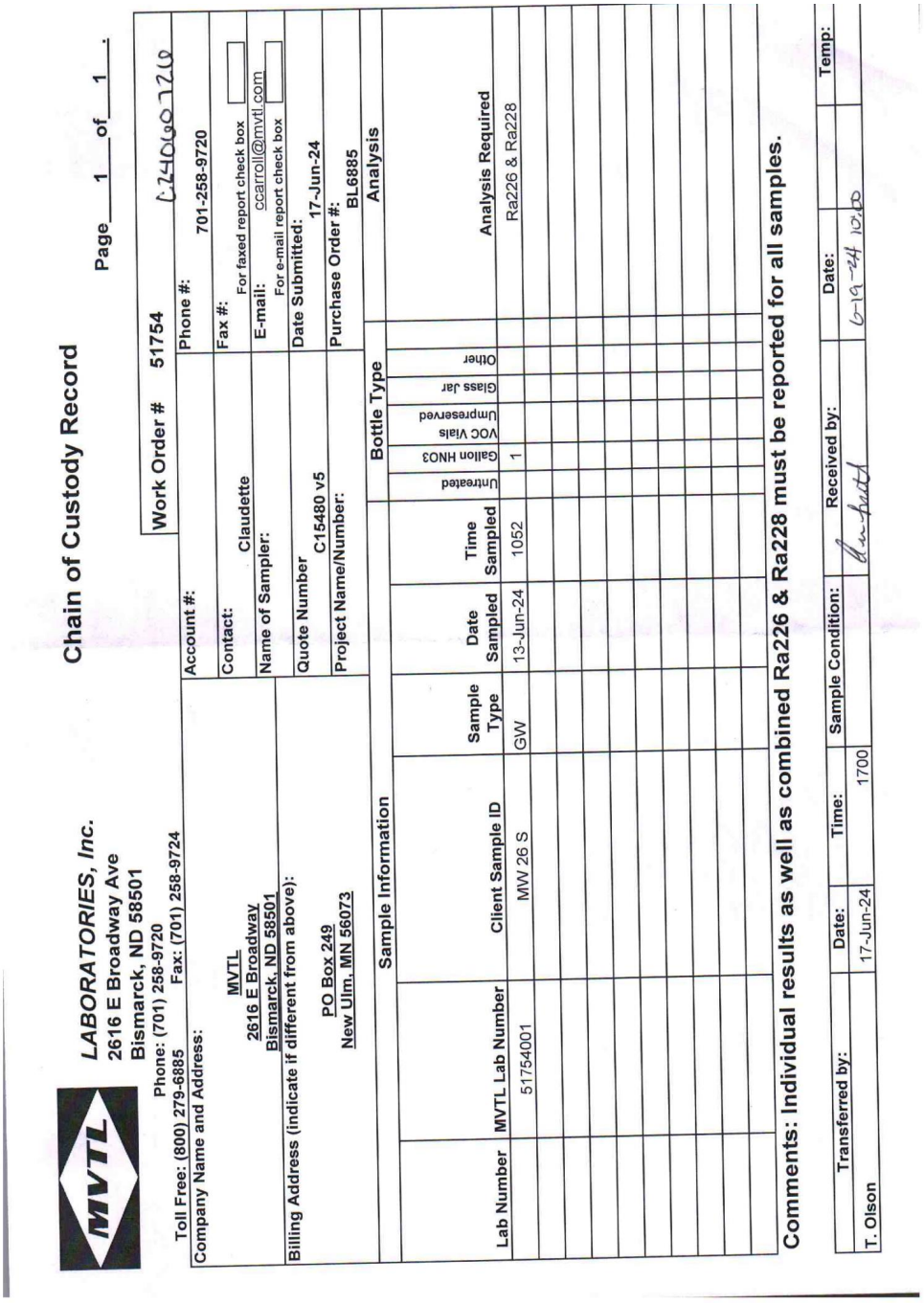
Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative



MVTL LABORATORIES, Inc.
2616 E Broadway Ave
Bismarck, ND 58501
Phone: (701) 258-9720
Toll Free: (800) 279-6885 Fax: (701) 258-9724

Chain of Custody Record

Page 1 of 1

Work Order # 51754 C240690720

Company Name and Address: MVTL, 2616 E Broadway, Bismarck, ND 58501
Account #:
Contact: Claudette
Name of Sampler:
Phone #: 701-258-9720
Fax #: For faxed report check box
E-mail: ccarroll@mvtl.com For e-mail report check box
Date Submitted: 17-Jun-24
Quote Number C15480 v5
Project Name/Number:
Purchase Order #: BL6885

Billing Address (indicate if different from above): PO Box 249, New Ulm, MN 56073

Lab Number	MVTL Lab Number	Client Sample ID	Sample Type	Date Sampled	Time Sampled	Bottle Type: Untreated	Gallon HNO3	VOC Vials Unpreserved	Glass Jar	Other	Analysis Required
	51754001	MW 26 S	GW	13-Jun-24	1052		1				Ra226 & Ra228

Comments: Individual results as well as combined Ra226 & Ra228 must be reported for all samples.

Transferred by:	Date:	Time:	Sample Condition:	Received by:	Date:	Temp:
T. Olson	17-Jun-24	1700		[signature]	6-19-24 1010	

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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

Member ACIL

Account #: 2040 **Client:** Basin Electric Power Cooperative

Minnesota Valley Testing Laboratories, Inc.
2616 East Broadway Avenue
Bismarck, ND 58501
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Basin Electric Power Coop
WO: 52087

Chain of Custody

Page 1 of 1

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	**Account #** 2040	**Work Order #** Lab Use Only
Billing Address (indicate if different from above)	**Contact** Mark Dihle	**Phone #** 701-745-7238 701-557-5488
	Name of Sampler mls	**Emails** mdihle@bepc.com aknutson@bepc.com Ksolie@barr.com
	Quote Number	**Date Submitted** 6/18/2024
	Project Name/Number AVS CCR Wells	**Purchase Order #** 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
003	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

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Basin Electric Power Coop
WO: 52088

Chain of Custody

Page 1 of 1

Work Order #
Lab Use Only

Company Name and Address Basin Electric Power Coop. Leland Olds Station 3901 Highway 200A Stanton, ND 58571	Account # 2040	Phone # 701-745-7238 701-557-5488
	Contact Mark Dihle	Emails mdihle@bepc.com aknutson@bepc.com
	Name of Sampler mls	Ksolie@barr.com
Billing Address (indicate if different from above)	Quote Number	Date Submitted 6/18/2024
	Project Name/Number AVS CCR Wells	Purchase Order # 790708-01

Lab Use Only Lab	Sample ID	Sample Matrix GW - Groundwater	Date Sampled	Time Sampled	Bottles	Y/N	Analysis Required
001	MW 27 S	GW	6/17/2024	1040	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
002	MW 25 S	GW	6/17/2024	920	3	N	B, Ca, Cl, F, SO_4, Sb, As, Ba, Be, Cd, Cr, Co,Pb, Li, Hg, Mo, Se, Tl, Ra226, Ra228, TDS
—	DUP	GW	6/17/2024	920	2	N	B, Ca, Cl, F, SO_4, TDS

Comments:

Transferred by	Date	Time	Received by	Date	Time	Temp	ROI	Therm. #
MILLENNIUM EXPRESS	6/18/2024			18 Jun 24	1446	3.4°C	(Y) N	TM920
2.							Y / N	

Please submit the top copy with your samples. We will return the completed original with your results.

Form # 80-910005-1 See above for page number Effective Date: 26 Aug 2022

Appendix C Groundwater Flow Rate

Appendix C
Groundwater Flow Rate
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

AVS Groundwater Velocity Calculation

Date	6/10/2024		
	UG: MW-19S	**UG: MW-18S**	
Kh (ft/d)	0.234	0.234	*CCR Groundwater Monitoring System Report (AECOM, 2017)*
porosity, n	0.185	0.185	*CCR Groundwater Monitoring System Report (AECOM, 2017)*
gradient, i (ft/ft)	0.002	0.004	
V (ft/d)	3.142E-03	5.580E-03	
V (ft/yr)	1.15	2.04	
Flow Direction	**E-NE**	**NE**	

	Top of Casing Elevation	**Depth to Water**	**Water Level Elevation**	
	ft amsl	ft below TOC	ft amsl	
MW-15S	2104.77	218.62	1886.15	
MW-16S	2123.59	235.74	1887.85	
MW-17S	2124.89	238.05	1886.84	
MW-18S	2091.60	198.56	1893.04	
MW-19S	2042.56	148.83	1893.73	
MW-20S	2107.47	219.80	1887.67	
MW-21S	2094.72	202.30	1892.42	
MW-22S	2093.90	209.73	1884.17	
MW-24S	2070.74	206.46	1864.28	
MW-25S	2083.40	198.23	1885.17	
MW-26S	2074.50	190.21	1884.29	
MW-27S	2071.60	217.80	1853.80	Not used for flow or gradient calculations

AVS Landfill horizontal distance, ft

	MW-19S	**MW-18S**
MW-15S	2640	
MW-16S	2746	
MW-17S	2904	
MW-20S	2746	
MW-22S	3379	
MW-24S		3643
MW-25S		2904
MW-26S		3326
MW-27S		3590
	*Used UG well MW-19S for MW-15S, 16S, 17S, 20S, and 22S flow calculations	*Used UG well MW-18S for MW-24S, 25S, and 26S flow calculations

Appendix C
Groundwater Flow Rate
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

AVS difference in WL elevation, ft

	MW-19S	MW-18S
MW-15S	7.58	
MW-16S	5.88	
MW-17S	6.89	
MW-20S	6.06	
MW-22S	9.56	
MW-24S		28.76
MW-25S		7.87
MW-26S		8.75

AVS horizontal gradient, ft/ft

	MW-19S	MW-18S
MW-15S	0.003	
MW-16S	0.002	
MW-17S	0.002	
MW-20S	0.002	
MW-22S	0.003	
MW-24S		0.008
MW-25S		0.003
MW-26S		0.003
Average	0.002	0.004

Appendix C
Groundwater Flow Rate
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

AVS Groundwater Velocity Calculation

Date	10/1/2024		
	UG: MW-19S	**UG: MW-18S**	
Kh (ft/d)	0.234	0.234	*CCR Groundwater Monitoring System Report (AECOM, 2017)*
porosity, n	0.185	0.185	*CCR Groundwater Monitoring System Report (AECOM, 2017)*
gradient, i (ft/ft)	0.002	0.005	
V (ft/d)	2.974E-03	6.710E-03	
V (ft/yr)	1.09	2.45	
Flow Direction	**E-NE**	**NE**	

	Top of Casing Elevation	**Depth to Water**	**Water Level Elevation**
	ft amsl	ft below TOC	ft amsl
MW-15S	2104.77	218.96	1885.81
MW-16S	2123.59	235.95	1887.64
MW-17S	2124.89	238.31	1886.58
MW-18S	2091.60	199.09	1892.51
MW-19S	2042.56	149.44	1893.12
MW-20S	2107.47	220.11	1887.36
MW-21S	2094.72	202.70	1892.02
MW-22S	2093.90	209.71	1884.19
MW-24S	2070.74	206.19	1864.55
MW-25S	2083.40	198.02	1885.38
MW-26S	2074.50	190.41	1884.09
MW-27S	2071.60	209.81	1861.79

AVS Landfill horizontal distance, ft

	MW-19S	**MW-18S**
MW-15S	2640	
MW-16S	2746	
MW-17S	2904	
MW-20S	2746	
MW-22S	3379	
MW-24S		3643
MW-25S		2904
MW-26S		3326
MW-27S		3590
	*Used UG well MW-19S for MW-15S, 16S, 17S, 20S, and 22S flow	*Used UG well MW-18S for MW-24S, 25S, and 26S flow

Appendix C
Groundwater Flow Rate
2024 Annual Monitoring Report
AVS CCR Groundwater Compliance

AVS difference in WL elevation, ft

	MW-19S	MW-18S
MW-15S	7.31	
MW-16S	5.48	
MW-17S	6.54	
MW-20S	5.76	
MW-22S	8.93	
MW-24S		27.96
MW-25S		7.13
MW-26S		8.42
MW-27S		30.72

AVS horizontal gradient, ft/ft

	MW-19S	MW-18S
MW-15S	0.003	
MW-16S	0.002	
MW-17S	0.002	
MW-20S	0.002	
MW-22S	0.003	
MW-24S		0.008
MW-25S		0.002
MW-26S		0.003
MW-27S		0.009
Average	0.002	0.005

Appendix D Baseline Sample Results

AVS Baseline Sampling
2024 Analytical Results

		Location	MW-25S		MW-25S	MW-26S	MW-26S	MW-27S	MW-27S
		Date	6/17/2024		10/02/2024	6/13/2024	10/02/2024	6/17/2024	10/02/2024
		Sample Type	N	FD	N	N	N	N	N
Parameter	Analysis Location	Units							
General Parameters									
Chloride	Lab	mg/l	**43.8**	**43.3**	**42.3**	**29.7**	**29.7**	**80.8**	**62.0**
Fluoride	Lab	mg/l	**1.29**	**1.29**	**1.30**	**1.34**	**1.33**	**1.17**	**1.27**
Solids, total dissolved	Lab	mg/l	**1900**	**1900**	**1900**	**1760**	**1730**	**2290**	**2160**
Sulfate, as SO4	Lab	mg/l	**24.6**	**24.7**	**40.2**	**45.1**	**41.0**	**252**	**6.83**
Dissolved oxygen	Field	mg/l	**0.49**	--	**0.27**	**0.35**	**0.28**	**3.45**	**1.72**
pH	Field	pH units	**8.18**	--	**8.19**	**8.15**	**8.17**	**8.03**	**8.08**
Redox (oxidation potential)	Field	mV	**-3**	--	**-34**	**-43.2**	**-32.3**	**123.4**	**-116.9**
Specific conductance @ 25 deg C	Field	umhos/cm	**2889**	--	**2918**	**2665**	**2678**	**3016**	**3063**
Temperature	Field	deg C	**9.3**	--	**10.6**	**10.9**	**11.2**	**8.5**	**11.5**
Turbidity	Field	NTU	**37.7**	--	**14.3**	**27.9**	**19.7**	**570**	--
Total Metals									
Antimony	Lab	mg/l	< 0.001 U	--	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U	< 0.001 U
Arsenic	Lab	mg/l	< 0.002 U	--	< 0.002 U	< 0.002 U	< 0.002 U	**0.0116**	**0.0472**
Barium	Lab	mg/l	**0.0994**	--	**0.1306**	**0.0486**	**0.0514**	**0.3396**	**1.472**
Beryllium	Lab	mg/l	< 0.0005 U	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.0015**	**0.0082**
Boron	Lab	mg/l	**0.12**	**0.11**	**0.12**	**0.13**	**0.14**	**0.19**	**0.40**
Cadmium	Lab	mg/l	< 0.0005 U	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.0007**	**0.0036**
Calcium	Lab	mg/l	**6.12**	**5.95**	**4.88**	**4.10**	**3.51**	**28.3**	**206**
Chromium	Lab	mg/l	**0.0025**	--	< 0.002 U	< 0.002 U	< 0.002 U	**0.0863**	**0.5667**
Cobalt	Lab	mg/l	< 0.002 U	--	< 0.002 U	< 0.002 U	< 0.002 U	**0.0141**	**0.0932**
Lead	Lab	mg/l	**0.0006**	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.0206**	**0.1238**
Lithium	Lab	mg/l	**0.0430**	--	**0.0425**	**0.0490**	**0.0483**	**0.0755**	**0.201**
Mercury	Lab	mg/l	< 0.0002 U	--	< 0.0002 U	< 0.0002 U	< 0.0002 U	< 0.0002 U	< 0.001 U
Molybdenum	Lab	mg/l	**0.0033**	--	**0.0020**	**0.0052**	< 0.002 U	**0.1457**	**0.1332**
Selenium	Lab	mg/l	< 0.005 U	--	< 0.005 U	< 0.005 U	< 0.005 U	< 0.005 U	**0.0088**
Thallium	Lab	mg/l	< 0.0005 U	--	< 0.0005 U	< 0.0005 U	< 0.0005 U	< 0.0005 U	**0.0011**
Radiochemical Parameters*									
Radium 226	Lab	pCi/l	0.3 +/- 0.2 ND	--	0.08 +/- 0.1 ND	0.08 +/- 0.2 ND	0.1 +/- 0.1 ND	**3.2 +/- 1**	**5.7 +/- 5.3**
Radium 228	Lab	pCi/l	1.1 +/- 0.9 ND	--	0.2 +/- 0.8 ND	0.5 +/- 0.8 ND	**1.6 +/- 0.9**	2.9 +/- 3.5 ND	**12.3 +/- 5.7**
Radium, combined (226+228)	Barr Calculation	pCi/l	**1.4 +/- 0.9 q**	--	0.3 +/- 0.8 ND	0.58 +/- 0.8 ND	**1.7 +/- 0.9 q**	**6.1 +/- 3.7 q**	**18.0 +/- 7.8**

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
*	Values displayed in order: results, uncertainty, and MRL
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
ND	Not detected.
q	The combined radium result includes both detected and not detected values.
U	The analyte was analyzed for, but was not detected.