Corn Belt
Power Cooperative

A Touchstone Energy® Cooperative

November 14, 2024

Submitted via e-mail to:
mick.leat@dnr.iowa.gov

Subject: Corn Belt Power Cooperative – Wisdom Station CCR Landfill
2024 Annual Water Quality Report and Semiannual Site Inspection Reports
Permit #21-SPD-04-95C

Dear Mr. Leat:

Attached please find the 2024 Annual Water Quality Report and Semi-Annual Site Inspection Reports for the Wisdom Station CCR Landfill owned and operated by Corn Belt Power Cooperative.

If you have any questions or comments concerning this submittal, please don't hesitate to contact me.

Sincerely,

CORN BELT POWER COOPERATIVE

Mike Thatcher
Vice President, Power Supply

Attachments: 2024 AWQR Corn Belt Power Coop – Wisdom Station
2024 Semi-Annual Site Inspection Reports – Wisdom Station

cc:
becky.jolly@dnr.iowa.gov
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KJensen@scsengineers.com

2024 Annual Water Quality Report

Corn Belt Power Cooperative
Wisdom Station CCR Landfill
Solid Waste Permit No. 21-SDP-04-95C

Prepared for:

Corn Belt Power Cooperative

SCS ENGINEERS

27224479.00 | November 2024

1690 All-State Court, Suite 100
West Des Moines, Iowa 50265
515-631-6160

CERTIFICATION

Prepared by: Semir D Date: 11/14/2024

Typed: Semir Omerovic

Reviewed by: [signature] Date: 11/14/2024

Typed: Timothy C. Buelow, P.E.

Certification page (103.1(4)"e")

An annual report summarizing the effect of the facility on groundwater and surface water quality shall be submitted to the department each year. The summary is to be prepared by an engineer registered in the state of Iowa.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

[signature] Date: 11/14/2024

Timothy C. Buelow, P.E.

License No. 14445

My license renewal date is December 31, 2025.

Pages or sheets covered by this seal:

All except Appendix B-1.

EXECUTIVE SUMMARY

ES.1 PERIOD OF REPORT COVERAGE

SCS Engineers (SCS), on behalf of Corn Belt Power Cooperative, has completed the required groundwater sampling for the Wisdom Station Coal Combustion Residue (CCR) Landfill (Landfill). The purpose of this Annual Water Quality Report (AWQR) is to document and statistically evaluate the groundwater sampling results since the 2023 AWQR up to and including the 2024 annual sampling event. This AWQR was prepared in accordance with the requirements of Iowa Administrative Code (IAC) 567-103, the site permit, and current requirements for implementation of the Hydrologic Monitoring System Plan (HMSP).

ES.2 REPORT PRIORITY

The following summarizes report priorities associated with groundwater compliance at the Landfill:

- Department review urgency: None.
- Department review impact on rules schedule: None.
- Actions or activities on hold pending Department review or comment: None.
- Actions and/or permit amendments needed: None.

ES.3 SITE STATUS AND APPLICABLE RULES

- Landfill Status: Closed, Closure Permit
- Types of waste previously accepted: Coal Combustion Residue (CCR)
- Applicable IAC rules: 567-103

ES.4 COMMENTS

The following summarizes points of special emphasis: Concentrations of the analyzed constituents in groundwater at the Landfill generally appear to be stable. Low-flow sample collection techniques have continued to provide samples with low concentrations of suspended solids and will continue to be utilized in future sample collection.

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Tables

Figures

Appendices

1.0 ACRONYMS/ABBREVIATIONS

AL = Action Level
CCV = Continuing Calibration Verification
CL = Control Limit - Mean plus Two Standard Deviations (+/- for pH)
DNR = Iowa Department of Natural Resources
DO = Dissolved Oxygen
GWPS = Groundwater Protection Standard
GWQAP = Groundwater Quality Assessment Plan
LEL = Lower Explosive Limit
LCL = Lower Confidence Limit
LCS = Laboratory Control Sample
LN = Lognormal
M+/-2SD = Mean Plus/Minus Two Standard Deviations
MCL = EPA Maximum Contaminant Level
MDL = Method Detection Limit
N = Normal
NC = No Change
NM = Not Measured
ORP = Oxidation-Reduction Potential
PL = Prediction Limit
QA = Quality Assurance
QC = Quality Control
RL = Reporting Limit
SWS = DNR Statewide Standard for a Protected Groundwater Source
SSI = Statistically Significant Increase Above Background
SSL = Statistically Significant Level Above Groundwater Protection Standard
SSS = Site-Specific Standard (Site-Specific GWPS)
TSS = Total Suspended Solids
UCL = Upper Confidence Limit

2.0 SITE BACKGROUND

2.1 SITE LOCATION

The Wisdom Station CCR Landfill (Landfill) is depicted on Figure 1, Approved Monitoring Network. The Landfill property is located on an approximately 4-acre plot of land east of the Wisdom Station Power Plant and County Road B24, approximately 5 miles west of Spencer, Iowa. The legal description is as follows: Southeast ¼ of Section 6, Township 96 North, Range 37 West, Clay County, Iowa.

2.2 FACILITY

The Landfill is classified as a coal-combustion residue landfill and it contains coal ash from power generation at the plant and lime softening solids used to treat cooling water at the plant. The Landfill was in operation from 1960 to 2015 and filling began in the southwest corner and expanded eastward over that time period.

2.3 GEOLOGY OF THE SITE

The following information pertaining to this section was obtained from the Hydrogeologic Investigation Report prepared by Preston Engineering, Inc., January 1997:

> *The geologic materials at the surface consist of Quaternary ground moraine and lake bed sediments. Unconsolidated sediments of Quaternary and Pleistocene age are at least 300 feet thick. Beneath these sediments is Cretaceous shale of the Dakota Group.*
>
> *Boring logs of wells from the area, available from the Iowa Geologic Survey, show that most wells are 50 feet or less in depth and are completed in Pleistocene sand and gravel.*
>
> *Ten soil borings from the site, drilled and logged by Stanley Engineering Company in 1958, show that there is about 1 foot of topsoil, 1.5 to 2 feet of yellow sandy clay subsoil, about 20 feet of sand and gravel, and at least 53 feet of gray clay. None of the borings encountered bedrock.*

2.4 HYDROLOGY OF THE SITE

The following information pertaining to this section was obtained from the Hydrogeologic Investigation Report prepared by Preston Engineering, Inc., January 1997:

> *The surficial sand is fine to medium grained, poorly graded, and has less than 10 percent silt and clay. The water table aquifer is in the sand. Slug tests on wells in the sand show that it has a high conductivity which means that groundwater and leachate will quickly move through it if even a slight gradient exists. Underlying the sand is a clay layer that is over 50 feet thick. A comparison between the permeability of the clay and the hydraulic conductivity of the sand from slug tests shows that the clay is about 10 million times less permeable than the sand. The clay layer should be a good aquiclude, based on its thickness and low permeability in the area beneath the landfill.*

3.0 FIGURES DISCUSSION

The following figures are attached.

3.1 FIGURE 1 – APPROVED MONITORING NETWORK

The Landfill property and hydrological monitoring system plan (HMSP) network are depicted in **Figure 1**. **Figure 1** indicates the locations of each monitoring well.

3.2 FIGURE 2 – GROUNDWATER CONTOURS

A groundwater contour map based on water levels measured in the monitoring wells during the September 2024 groundwater sampling event is included as **Figure 2**. **Figure 2** indicates a generally divergent easterly flow direction.

4.0 QA/QC SUMMARY

Date indicates the date(s) of sampling.

4.1 SEPTEMBER 12, 2024 (2024 ANNUAL SAMPLING EVENT)

Based on the QA review, no samples were rejected as unusable due to QC failures. In general, the quality of the analytical data for this reporting period does not appear to have been compromised by analytical irregularities and results affected by QC anomalies are qualified with the appropriate data flags, which are listed in the laboratory report in Appendix B-1. Data validation documentation can be found in Appendix B-2.

5.0 DATA EVALUATION

Statistical evaluation in accordance with the requirements of IAC 567-103, the closure permit, and subsequent permit amendments and correspondence were conducted for the groundwater analytical data collected during the 2024 annual sampling event. The statistical evaluation for samples collected during the 2024 annual sampling event is located in **Appendix D** of this report.

5.1 DATA EVALUATION

Groundwater monitoring for the Landfill consists of samples from one upgradient monitoring well located on the northeast corner of the Landfill and four downgradient monitoring wells, one located along the eastern border of the Landfill, one located off the southeast corner of the Landfill, one located along the southern border of the Landfill, and one located along the western border of the Landfill.

There were five prediction limit exceedances detected based on 2024 sampling results as listed in **Table 1** compared to four prediction limit exceedances detected based on 2023 sampling results as reported in the 2023 AWQR. Most of the prediction limit exceedances detected based on 2024 sampling results were attributed to monitoring well MW-7. A change to low-flow sample collection techniques was initiated during the 2023 sampling event in an effort to reduce total suspended solids in the samples. Low-flow sample collection techniques provided samples with low concentrations of suspended solids during the 2023 and 2024 sampling events.

Exceedances of action or advisory levels were largely associated with manganese as listed in **Table 9**. The monitoring wells, in which manganese exceeded action or advisory levels, were MW-4, MW-5, MW-6, and MW-7. It should be noted that monitoring well MW-4 is classified as an upgradient monitoring well. Manganese has generally exceeded the regulatory action or advisory levels established for this Landfill at most downgradient monitoring wells since sampling for these constituents began in 2016.

5.2 TRENDING IN MONITORING WELLS

Statistically significant decreasing trends at a 99% confidence level (α=0.01) were identified in three monitoring well/constituent pairs by Mann Kendall trend analysis during this reporting period. The trend analysis is included in **Attachment D** of **Appendix D**. The statistically significant trends were as follows:

Monitoring Point	Constituent	Trend
MW-7	Barium	Decreasing
MW-7	Cadmium	Decreasing
MW-7	Copper	Decreasing

Although not necessarily statistically significant, the Mann-Kendall statistics can provide an indication of general trending in the data. Trend indications for wells in the monitoring program are shown in the table below. The statistics used to develop the general trending differ from the Mann-Kendall statistics used in the diagnostics section of the statistical evaluation in that a much lower trend threshold is applied for the general trending information (α=0.20 versus α=0.01). Trends classified as decreasing or increasing exhibited a statistically significant trend with 80% confidence using the most recent eight data points. Trends classified as stable did not exhibit a statistically

significant trend with 80% confidence using the eight most recent data points. A summary of Mann-Kendall statistics by constituent in each monitoring point is included in **Appendix E** of this report.

Trending in Monitoring Wells				
Monitoring Well	**Decreasing Trends**	**Stable Trends**	**Increasing Trends**	**Number of Constituents Analyzed**
MW-1	41.70%	58.30%	0.00%	12
MW-4 (u)	9.09%	90.91%	0.00%	11
MW-5	16.67%	66.67%	16.67%	12
MW-6	9.09%	81.82%	9.09%	11
MW-7	33.33%	66.67%	0.00%	12
Site Wide	**22.41%**	**72.41%**	**5.17%**	**58**

(u) indicates an upgradient monitoring point.

Review of the Mann-Kendall statistics indicated that approximately 95% of the Mann-Kendall statistics were considered stable or decreasing following the 2024 annual statistical evaluation. There were three monitoring well/constituent pairs with a generally increasing trend. The monitoring well/constituent pairs with increasing trends are discussed in the following table.

Monitoring Well	Constituent Name	Comments
MW-5	Chloride	Based on eleven actual detections with duplicate data included. Recent detections are generally above earlier detections. Highest concentration of 26.7 mg/L measured in 2022.
MW-5	Sulfate	Based on eleven actual detections with duplicate data included. Recent detections are generally above earlier detections. Highest concentration of 122 mg/L measured in 2022.
MW-6	Chloride	Based on eight actual detections. Recent detections are generally above earlier detections. Maximum concentration in recent trend of 21.2 mg/L measured in 2022.

Three monitoring well/constituent pairs were found to be increasing at an 80% confidence level based on 2024 sampling results compared to the five increasing trends measured at an 80% confidence level based on 2023 sampling results. It should be noted that the monitoring well/constituent pairs found to be increasing at an 80% confidence level based on 2024 sampling results did not exceed their respective prediction limit in 2024 and that the highest concentrations in the recent sample trends were all measured in 2022 before the incorporation of low-flow sampling techniques.

6.0 RECOMMENDATIONS

6.1 SITE IMPACT ON GROUNDWATER

Concentrations of the analyzed constituents in groundwater at the Landfill generally appear to be stable to decreasing. Prediction limit exceedances detected in 2024 were similar to those detected in 2023. Low-flow sample collection techniques utilized since the 2023 sampling event have continued to produce samples with low concentrations of suspended solids and will continue to be utilized in future sample collection.

6.2 PROPOSED MONITORING

The groundwater monitoring program is summarized in Table 1. No changes to the HMSP monitoring program are recommended at this time. It is recommended that sampling continue for calendar year 2025 as summarized in Table 2.

6.3 PROPOSED MONITORING WELL CHANGES

Monitoring well performance is summarized in Table 4. No proposed changes to the existing monitoring wells are recommended at this time.

Tables

Table 1
Monitoring Program Summary
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Monitoring Well	Formation	Current Monitoring Program	Change for Next Sampling Event	Prediction Limit Exceedances	Total Number of Samples in Each Monitoring Program Since January 1, 2018		
					Routine	Supplemental	Remedial Action
MW-1	Shallow alluvial sand and gravel	Detection	None	-	7	-	-
MW-4	Shallow alluvial sand and gravel	Background	None	-	7	-	-
MW-5	Shallow alluvial sand and gravel	Detection	None	Cadmium, Manganese	7	-	-
MW-6	Shallow alluvial sand and gravel	Detection	None	-	7	-	-
MW-7	Shallow alluvial sand and gravel	Detection	None	Cobalt, Manganese, Sulfate	7	-	-

Notes: None.

Table 2
Monitoring Program Implementation Schedule
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Monitoring Well	Recent Sampling Dates and Constituents	Upcoming Sampling Dates and Constituents
	9/12/2024	2025
MW-1	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS
MW-4	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS
MW-5	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS
MW-6	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Zinc, TSS
MW-7	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Selenium, Zinc, TSS	Chloride, Sulfate, Fluoride, Arsenic, Barium, Boron, Cadmium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Selenium, Zinc, TSS

Note: TSS – Total Suspended Solids.

Table 4
Monitoring Well Performance and Maintenance Summary
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Well	Top of Casing	Top of Screen	Total Depth		Date of Measurements	Maximum Depth
					9/12/2024	Discrepancy (ft)
MW-1	1343.40	1334.60	18.7	Groundwater Level (ft)	11.11	0.1
				Groundwater Elevation (Ft MSL)	1332.29	
				Measured Well Depth (ft)	18.6	
				Submerged screen	N	
MW-4	1338.11	1332.02	15.6	Groundwater Level (ft)	6.20	-0.1
				Groundwater Elevation (Ft MSL)	1331.91	
				Measured Well Depth (ft)	15.7	
				Submerged screen	N	
MW-5	1338.04	1331.69	15.7	Groundwater Level (ft)	5.89	-0.1
				Groundwater Elevation (Ft MSL)	1332.15	
				Measured Well Depth (ft)	15.8	
				Submerged screen	Y	
MW-6	1337.93	1331.63	15.8	Groundwater Level (ft)	6.18	-0.2
				Groundwater Elevation (Ft MSL)	1331.75	
				Measured Well Depth (ft)	16.0	
				Submerged screen	Y	
MW-7	1344.83	1335.80	19.9	Groundwater Level (ft)	12.94	0.1
				Groundwater Elevation (Ft MSL)	1331.89	
				Measured Well Depth (ft)	19.8	
				Submerged screen	N	

Comments:

1) Measured well depths were within 1.0 foot of the installed depths where measured.

Table 5
Background and GWPS Summary
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Interwell Background/GWPS (MW-4)

Constituent	Units	Samples	Detections	Min	Max	Mean	Background Level	Statistical Test	Action Level	Source
Inorganics										
Arsenic	mg/L	9	9	0.00303	0.00533	0.00413	0.006579	PL (P)	0.01 mg/L	MCL/SWS
Barium	mg/L	9	9	0.0855	0.184	0.1248	0.2286	PL (P)	2.0 mg/L	MCL/SWS
Cadmium	mg/L	9	2	.00005 (1/2 RL)	0.00025 (1/2 RL)	0.000145	0.00025	PL (NP)	0.005 mg/L	MCL/SWS
Chloride	mg/L	9	9	12.6	61.1	24.11	75.21	PL (P)	-	-
Cobalt	mg/L	9	5	0.000223*	0.00131	0.00046	0.00166	PL (P)	0.0021 mg/L	SWS
Copper	mg/L	9	1	0.0025 (1/2 RL)	0.00496*	0.00277	0.005	PL (NP)	1.3 mg/L	SWS
Iron	mg/L	9	9	0.308	3.75	1.905	5.254	PL (P)	-	-
Lead	mg/L	9	8	0.00025 (1/2 RL)	0.00455	0.00136	0.005436	PL (P)	0.015 mg/L	MCL/SWS
Magnesium	mg/L	9	9	18.5	38.3	28.2	48.7	PL (P)	-	-
Manganese	mg/L	9	9	0.113	0.387	0.253	0.4895	PL (P)	0.3 mg/L	HAL/SWS
Molybdenum	mg/L	3	3	0.00156*	0.00209	0.00189	-	-	0.04 mg/L	MCL/SWS
Selenium	mg/L	6	0	0.0025 (1/2 RL)	0.0025 (1/2 R/L)	0.0025	< 0.005	DQR	0.05 mg/L	MCL/SWS
Sulfate	mg/L	9	9	44.6	94.9	59.900	110.4	PL (P)	250 mg/L	SMCL
Zinc	mg/L	9	8	0.01 (1/2 RL)	0.209	0.124	0.3202	PL (P)	2.0 mg/L	SWS

Notes: None.

Acronyms/Abbreviations:

RL = Reporting Limit
GWPS = Groundwater Protection Standard
SSS = Site-Specific GWPS
SWS = Statewide Standard
SD = Standard Deviation
MCL = EPA Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
PL = Prediction Limits
HAL = Health Advisory Level
DWA = Drinking Water Advisory
ND = Non-Detect

Comments:

1) **Water quality results and effectiveness of the statistical data evaluation criteria**: Statistical evaluations consist of prediction limits.
2) **Changes to the previous statistical method during reporting period:** None.

Table 6

Summary of Well/Detected Constituent Pairs With No Immediately Preceding Prediction Limit Exceedances

2024 Annual Water Quality Report

Corn Belt Power Cooperative - Wisdom Station CCR Landfill

Permit No. 21-SDP-04-95C

Well	Constituents	Units	Most Recent Result	Background Level
MW-5	Cadmium	mg/L	0.00088	0.00025
	Manganese	mg/L	0.6015	0.4895

Note: Tables include prediction limit exceedances identified during the 2024 sampling event that were not identified as prediction limit exceedances in the previous year.

Comments:

1) **Problems with the current HMSP network:** None.
2) **Schedule to implement remedies:** Not applicable.
3) **Alternative constituent or sample frequency changes:** None.
4) **Significant changes to prediction limits:** None.

Table 7
Summary Table of Ongoing and Newly Identified Prediction Limit Exceedances
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Key

Denotes ongoing prediction limit exceedances that were identified as prediction limit exceedances during this reporting period and the previous reporting period at least once during each reporting period.

Denotes newly identified prediction limit exceedances in the 2024 reporting period. Newly identified is defined as occuring at least once in the current reporting period but not in the immediately preceeding reporting period.

Well	Constituent	Units	Most Recent Result	Background Standard	Action Level/ Statewide Standard
MW-5	Cadmium	mg/L	0.00088	0.00025	0.005
	Manganese	mg/L	0.6015	0.4895	0.3
MW-7	Cobalt	mg/L	0.00172	0.001655	0.0021
	Manganese	mg/L	1.07	0.4895	0.3
	Sulfate	mg/L	175	110.4	250

Notes: None.

Comments:

1) **Problems with the current HMSP network:** None.
2) **Proposed remedies:** None.
3) **Alternative constituent or sample frequency changes:** None.
4) **Plume delineation strategies:** Not Applicable.
5) **Property owner notifications:** Not applicable.

Table 8
Summary of Groundwater Chemistry
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

The Summary of Groundwater Chemistry is located in Appendix C.

Table 9
Historical Control Limit and Action Level Exceedances
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

Key

	Prediction Limit Exceedance
X	Action Level Exceedance

Well	Constituent	2022	2023	2024
MW-1	Cadmium			
	Cobalt	**X**		
	Copper			
	Iron			
	Manganese	**X**		
MW-4 (u)	Manganese			**X**
MW-5	Cadmium			
	Manganese	**X**		**X**
MW-6	Arsenic	**X**		
	Barium			
	Cadmium			
	Cobalt	**X**		
	Iron			
	Manganese	**X**	**X**	**X**
MW-7	Cobalt	**X**		
	Manganese	**X**	**X**	**X**
	Molybdenum		**X**	**X**
	Sulfate			

Comments: None

Table 10
Groundwater Quality Assessment Plan Trend Analysis
2024 Annual Water Quality Report
Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Permit No. 21-SDP-04-95C

See Appendix E for Mann Kendall Trend Analysis.

Figures

Approved Monitoring Network

Figure 1

Legend

- HMSP Monitoring Well
- Approximate Waste Boundary

Corn Belt Power Cooperative
Wisdom Station CCR Landfill
Spencer, Iowa
Project No: 27224479.00
Drawing Date: November 2024

N
W E
S

0 50 100 200 300
Feet

SCS ENGINEERS
environmental consultants and contractors

Groundwater Contours

Figure 2

SCS ENGINEERS
environmental consultants and contractors

Legend

- Approximate Groundwater Contours Based on Field Measurements Taken September 12, 2024
- Approximate Monitoring Well Location
- Approximate Waste Boundary

Corn Belt Power Cooperative
Wisdom Station CCR Landfill
Spencer, Iowa
Project No: 27224479.00
Drawing Date: November 2024

N W E S

0 50 100 200 300 Feet

Appendix A

Field Sampling Forms

FORM FOR GROUNDWATER SAMPLING

Project:	**Corn Belt Power Cooperative**		
Monitoring Well/Piezometer ID:	**MW-1**	Date:	**9/12/2024**
Gradient:	Up	Sampler:	Konner Roth

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	18.6
Initial Static Water Level (feet):	11.11
Initial Groundwater Elevation (ft-amsl):	1332.29
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:29 PM	Purging start time.						
12:32 PM	17.7	5.0	426.6	7.32	-4.8	2.2	
12:35 PM	17.6	4.9	419.1	7.31	6.8	3.5	
12:38 PM	17.5	4.8	417.4	7.30	16.6	6.0	
12:41 PM	17.6	4.7	414.0	7.29	24.5	9.1	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	166.67

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Color-Clear Odor-None

FORM FOR GROUNDWATER SAMPLING

Project:	**Corn Belt Power Cooperative**		
Monitoring Well/Piezometer ID:	**MW-4**	Date:	**9/12/2024**
Gradient:	Up	Sampler:	Konner Roth

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	15.7
Initial Static Water Level (feet):	6.20
Initial Groundwater Elevation (ft-amsl):	1331.91
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:01 PM	Purging start time.						
12:04 PM	16.6	1.1	1018.7	6.82	-93.0	3.1	
12:07 PM	16.7	0.3	1019.2	6.78	-106.9	4.0	
12:10 PM	16.8	0.1	1018.5	6.77	-111.3	5.1	
12:13 PM	16.8	<0.1	1017.4	6.76	-112.4	6.0	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.9
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	158.33

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Color-Clear Odor-Sulfur

FORM FOR GROUNDWATER SAMPLING

Project:	**Corn Belt Power Cooperative**		
Monitoring Well/Piezometer ID:	**MW-5**	Date:	**9/12/2024**
Gradient:	Up	Sampler:	Konner Roth

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	15.8
Initial Static Water Level (feet):	5.89
Initial Groundwater Elevation (ft-amsl):	1332.15
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
11:29 AM	Purging start time.						
11:32 AM	16.5	1.2	851.7	6.85	62.7	19.9	
11:35 AM	16.7	0.3	851.3	6.82	17.5	2.9	
11:38 AM	16.9	0.1	837.7	6.81	1.0	1.9	
11:41 AM	17.0	<0.1	824.2	6.81	-5.7	1.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	166.67

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Color-Clear with black particles Odor-None

FORM FOR GROUNDWATER SAMPLING

Project:	**Corn Belt Power Cooperative**		
Monitoring Well/Piezometer ID:	**MW-6**	Date:	**9/12/2024**
Gradient:	Up	Sampler:	Konner Roth

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	16.0
Initial Static Water Level (feet):	6.18
Initial Groundwater Elevation (ft-amsl):	1331.75
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
11:01 AM	Purging start time.						
11:04 AM	15.6	0.7	816.0	6.97	121.1	3.1	
11:07 AM	15.6	0.2	814.3	6.87	101.9	4.3	
11:10 AM	15.5	<0.1	812.2	6.84	71.0	5.4	
11:13 AM	15.4	<0.1	808.5	6.82	38.9	7.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.1
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	175.00

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Color-Clear Odor-None

FORM FOR GROUNDWATER SAMPLING

Project:	**Corn Belt Power Cooperative**		
Monitoring Well/Piezometer ID:	**MW-7**	Date:	**9/12/2024**
Gradient:	Up	Sampler:	Konner Roth

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	19.8
Initial Static Water Level (feet):	12.94
Initial Groundwater Elevation (ft-amsl):	1331.89
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
10:33 AM	Purging start time.						
10:36 AM	15.5	0.8	754.1	7.06	143.7	19.4	
10:39 AM	15.5	0.3	771.3	6.95	144.4	12.3	
10:42 AM	15.5	0.1	811.1	6.91	143.7	7.7	
10:45 AM	15.4	<0.1	849.5	6.89	141.2	5.1	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	166.67

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Color-Clear Odor-None

Appendix B-1

Laboratory Analytical Data Sheets

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Kevin Jensen
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 10/23/2024 3:20:30 PM Revision 1

JOB DESCRIPTION

Corn Belt-Spencer CCR Landfill Sampling 2024

JOB NUMBER

310-290615-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

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Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Revision 1

Authorized for release by
Samuel Miller, Project Management Assistant I
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Table of Contents

Job ID: 310-290615-1 Eurofins Cedar Falls

Job Narrative
310-290615-1

REVISION

The report being provided is a revision of the original report sent on 10/7/2024. The report (revision 1) is being revised due to Client is requesting we add Molybdenum to all samples.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/13/2024 4:26 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.0°C.

HPLC/IC
Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: MW-6 (310-290615-4) and MW-7 (310-290615-5). Elevated reporting limits (RLs) are provided.

Method 9056A_ORGFM_28D: The following sample was diluted due to the nature of the sample matrix: MW-1 (310-290615-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-290615-1	MW-1	Water	09/12/24 12:50	09/13/24 16:26
310-290615-2	MW-4	Water	09/12/24 12:23	09/13/24 16:26
310-290615-3	MW-5	Water	09/12/24 11:59	09/13/24 16:26
310-290615-4	MW-6	Water	09/12/24 11:23	09/13/24 16:26
310-290615-5	MW-7	Water	09/12/24 10:55	09/13/24 16:26
310-290615-6	MW-D	Water	09/12/24 11:59	09/13/24 16:26

Detection Summary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-1 — Lab Sample ID: 310-290615-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.03		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	13.6		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00104	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0511		0.00200	0.000660	mg/L	1		6020B	Total/NA
Boron	0.159		0.100	0.0760	mg/L	1		6020B	Total/NA
Iron	0.0417	J	0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	16.5		0.500	0.150	mg/L	1		6020B	Total/NA
Manganese	0.0273		0.0100	0.00360	mg/L	1		6020B	Total/NA
Molybdenum	0.00181	J	0.00200	0.00130	mg/L	1		6020B	Total/NA
Total Suspended Solids	3.75		1.88	1.39	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 310-290615-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.8		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	58.0		5.00	2.10	mg/L	5		9056A	Total/NA
Fluoride	0.383	J	1.00	0.375	mg/L	5		9056A	Total/NA
Arsenic	0.00477		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.153		0.00200	0.000660	mg/L	1		6020B	Total/NA
Boron	0.102		0.100	0.0760	mg/L	1		6020B	Total/NA
Iron	3.75		0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	38.3		0.500	0.150	mg/L	1		6020B	Total/NA
Manganese	0.387		0.0100	0.00360	mg/L	1		6020B	Total/NA
Molybdenum	0.00209		0.00200	0.00130	mg/L	1		6020B	Total/NA
Total Suspended Solids	20.8		3.00	2.22	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-5 — Lab Sample ID: 310-290615-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25.1		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	94.3		5.00	2.10	mg/L	5		9056A	Total/NA
Fluoride	0.665	J	1.00	0.375	mg/L	5		9056A	Total/NA
Arsenic	0.00104	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0331		0.00200	0.000660	mg/L	1		6020B	Total/NA
Boron	0.160		0.100	0.0760	mg/L	1		6020B	Total/NA
Cobalt	0.000267	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Iron	0.177		0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	33.1		0.500	0.150	mg/L	1		6020B	Total/NA
Manganese	0.502		0.0100	0.00360	mg/L	1		6020B	Total/NA
Molybdenum	0.0127		0.00200	0.00130	mg/L	1		6020B	Total/NA
Total Suspended Solids	19.7		5.00	3.70	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 310-290615-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20.0		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	93.1		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00242		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.116		0.00200	0.000660	mg/L	1		6020B	Total/NA
Boron	0.131		0.100	0.0760	mg/L	1		6020B	Total/NA
Cadmium	0.000215		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.000437	J	0.000500	0.000170	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample ID: MW-6 (Continued)
Lab Sample ID: 310-290615-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	0.214		0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	26.5		0.500	0.150	mg/L	1		6020B	Total/NA
Manganese	0.483		0.0100	0.00360	mg/L	1		6020B	Total/NA
Zinc	0.0250		0.0200	0.00970	mg/L	1		6020B	Total/NA
Molybdenum	0.00624		0.00200	0.00130	mg/L	1		6020B	Total/NA
Total Suspended Solids	5.88		1.88	1.39	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-7
Lab Sample ID: 310-290615-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	22.3		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	175		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00246		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0830		0.00200	0.000660	mg/L	1		6020B	Total/NA
Boron	3.84		0.100	0.0760	mg/L	1		6020B	Total/NA
Cobalt	0.00172		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00184	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Iron	0.401		0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	28.7		0.500	0.150	mg/L	1		6020B	Total/NA
Manganese	1.07		0.0100	0.00360	mg/L	1		6020B	Total/NA
Selenium	0.00350	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Molybdenum	0.0664		0.00200	0.00130	mg/L	1		6020B	Total/NA
Total Suspended Solids	4.38		1.88	1.39	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-D
Lab Sample ID: 310-290615-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25.6		5.00	2.25	mg/L	5		9056A	Total/NA
Sulfate	97.5		5.00	2.10	mg/L	5		9056A	Total/NA
Fluoride	0.655	J	1.00	0.375	mg/L	5		9056A	Total/NA
Arsenic	0.000884	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0381		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cadmium	0.00166		0.00100	0.000500	mg/L	5		6020B	Total/NA
Cobalt	0.000293	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00180	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Iron	0.140		0.100	0.0360	mg/L	1		6020B	Total/NA
Magnesium	35.0		2.50	0.750	mg/L	5		6020B	Total/NA
Manganese	0.701		0.0500	0.0180	mg/L	5		6020B	Total/NA
Molybdenum	0.0227		0.0100	0.00650	mg/L	5		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-1
Lab Sample ID: 310-290615-1
Date Collected: 09/12/24 12:50
Matrix: Water
Date Received: 09/13/24 16:26

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**5.03**		5.00	2.25	mg/L			09/24/24 10:02	5
Sulfate	**13.6**		5.00	2.10	mg/L			09/24/24 10:02	5
Fluoride	<1.00		1.00	0.375	mg/L			09/24/24 10:02	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00104**	**J**	0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 20:43	1
Barium	**0.0511**		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 20:43	1
Boron	**0.159**		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 13:52	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 19:08	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 20:43	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 20:43	1
Iron	**0.0417**	**J**	0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 20:43	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 20:43	1
Magnesium	**16.5**		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 19:08	1
Manganese	**0.0273**		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 19:08	1
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 20:43	1
Molybdenum	**0.00181**	**J**	0.00200	0.00130	mg/L		09/18/24 09:00	10/04/24 13:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**3.75**		1.88	1.39	mg/L			09/17/24 20:21	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-4
Date Collected: 09/12/24 12:23
Date Received: 09/13/24 16:26

Lab Sample ID: 310-290615-2
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.8**		5.00	2.25	mg/L			09/24/24 10:37	5
Sulfate	**58.0**		5.00	2.10	mg/L			09/24/24 10:37	5
Fluoride	**0.383**	**J**	1.00	0.375	mg/L			09/24/24 10:37	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00477**		0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 20:45	1
Barium	**0.153**		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 20:45	1
Boron	**0.102**		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 13:55	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 19:12	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 20:45	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 20:45	1
Iron	**3.75**		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 20:45	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 20:45	1
Magnesium	**38.3**		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 19:12	1
Manganese	**0.387**		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 19:12	1
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 20:45	1
Molybdenum	**0.00209**		0.00200	0.00130	mg/L		09/18/24 09:00	10/04/24 13:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**20.8**		3.00	2.22	mg/L			09/17/24 15:55	1

Client Sample ID: MW-5
Date Collected: 09/12/24 11:59
Date Received: 09/13/24 16:26

Lab Sample ID: 310-290615-3
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25.1**		5.00	2.25	mg/L			09/24/24 10:48	5
Sulfate	**94.3**		5.00	2.10	mg/L			09/24/24 10:48	5
Fluoride	**0.665**	**J**	1.00	0.375	mg/L			09/24/24 10:48	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00104**	**J**	0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 20:47	1
Barium	**0.0331**		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 20:47	1
Boron	**0.160**		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 13:59	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 19:15	1
Cobalt	**0.000267**	**J**	0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 20:47	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 20:47	1
Iron	**0.177**		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 20:47	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 20:47	1
Magnesium	**33.1**		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 19:15	1
Manganese	**0.502**		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 19:15	1
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 20:47	1
Molybdenum	**0.0127**		0.00200	0.00130	mg/L		09/18/24 09:00	10/04/24 13:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**19.7**		5.00	3.70	mg/L			09/17/24 20:21	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-6
Lab Sample ID: 310-290615-4
Date Collected: 09/12/24 11:23
Matrix: Water
Date Received: 09/13/24 16:26

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**20.0**		5.00	2.25	mg/L			09/24/24 11:00	5
Sulfate	**93.1**		5.00	2.10	mg/L			09/24/24 11:00	5
Fluoride	<1.00		1.00	0.375	mg/L			09/24/24 11:00	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00242**		0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 20:58	1
Barium	**0.116**		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 20:58	1
Boron	**0.131**		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 14:03	1
Cadmium	**0.000215**		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 19:19	1
Cobalt	**0.000437**	**J**	0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 20:58	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 20:58	1
Iron	**0.214**		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 20:58	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 20:58	1
Magnesium	**26.5**		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 19:19	1
Manganese	**0.483**		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 19:19	1
Zinc	**0.0250**		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 20:58	1
Molybdenum	**0.00624**		0.00200	0.00130	mg/L		09/18/24 09:00	10/04/24 14:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**5.88**		1.88	1.39	mg/L			09/17/24 15:55	1

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-7
Lab Sample ID: 310-290615-5
Date Collected: 09/12/24 10:55
Matrix: Water
Date Received: 09/13/24 16:26

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	22.3		5.00	2.25	mg/L			09/24/24 11:12	5
Sulfate	175		5.00	2.10	mg/L			09/24/24 11:12	5
Fluoride	<1.00		1.00	0.375	mg/L			09/24/24 11:12	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00246		0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 21:01	1
Barium	0.0830		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 21:01	1
Boron	3.84		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 14:06	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 19:23	1
Cobalt	0.00172		0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 21:01	1
Copper	0.00184	J	0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 21:01	1
Iron	0.401		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 21:01	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 21:01	1
Magnesium	28.7		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 19:23	1
Manganese	1.07		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 19:23	1
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 21:01	1
Selenium	0.00350	J	0.00500	0.00140	mg/L		09/18/24 09:00	09/18/24 21:01	1
Molybdenum	0.0664		0.00200	0.00130	mg/L		09/18/24 09:00	10/04/24 14:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	4.38		1.88	1.39	mg/L			09/17/24 15:55	1

Client Sample ID: MW-D
Lab Sample ID: 310-290615-6

Date Collected: 09/12/24 11:59
Matrix: Water

Date Received: 09/13/24 16:26

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25.6**		5.00	2.25	mg/L			09/24/24 11:46	5
Sulfate	**97.5**		5.00	2.10	mg/L			09/24/24 11:46	5
Fluoride	**0.655**	**J**	1.00	0.375	mg/L			09/24/24 11:46	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.000884**	**J**	0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 21:03	1
Barium	**0.0381**		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 21:03	1
Boron	<0.500		0.500	0.380	mg/L		09/18/24 09:00	09/24/24 18:29	5
Cadmium	**0.00166**		0.00100	0.000500	mg/L		09/18/24 09:00	09/24/24 18:29	5
Cobalt	**0.000293**	**J**	0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 21:03	1
Copper	**0.00180**	**J**	0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 21:03	1
Iron	**0.140**		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 21:03	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 21:03	1
Magnesium	**35.0**		2.50	0.750	mg/L		09/18/24 09:00	09/24/24 18:29	5
Manganese	**0.701**		0.0500	0.0180	mg/L		09/18/24 09:00	09/24/24 18:29	5
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 21:03	1
Molybdenum	**0.0227**		0.0100	0.00650	mg/L		09/18/24 09:00	09/24/24 18:29	5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88	1.39	mg/L			09/17/24 20:21	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-434244/3
Matrix: Water
Analysis Batch: 434244

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.450	mg/L			09/24/24 09:27	1
Sulfate	<1.00		1.00	0.420	mg/L			09/24/24 09:27	1
Fluoride	<0.200		0.200	0.0750	mg/L			09/24/24 09:27	1

Lab Sample ID: LCS 310-434244/4
Matrix: Water
Analysis Batch: 434244

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.690		mg/L		97	90 - 110
Sulfate	10.0	10.00		mg/L		100	90 - 110
Fluoride	2.00	1.889		mg/L		94	90 - 110

Lab Sample ID: 310-290615-1 MS
Matrix: Water
Analysis Batch: 434244

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	5.03		25.0	28.36		mg/L		93	80 - 120
Sulfate	13.6		25.0	38.26		mg/L		98	80 - 120
Fluoride	<1.00		5.00	5.135		mg/L		103	80 - 120

Lab Sample ID: 310-290615-1 MSD
Matrix: Water
Analysis Batch: 434244

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	5.03		25.0	26.58		mg/L		86	80 - 120	7	15
Sulfate	13.6		25.0	37.74		mg/L		96	80 - 120	1	15
Fluoride	<1.00		5.00	4.809		mg/L		96	80 - 120	7	15

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-433444/1-A
Matrix: Water
Analysis Batch: 433630

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433444

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200	0.000530	mg/L		09/18/24 09:00	09/18/24 19:56	1
Barium	<0.00200		0.00200	0.000660	mg/L		09/18/24 09:00	09/18/24 19:56	1
Boron	<0.100		0.100	0.0760	mg/L		09/18/24 09:00	09/18/24 19:56	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/18/24 09:00	09/18/24 19:56	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/18/24 09:00	09/18/24 19:56	1
Iron	<0.100		0.100	0.0360	mg/L		09/18/24 09:00	09/18/24 19:56	1
Lead	<0.000500		0.000500	0.000260	mg/L		09/18/24 09:00	09/18/24 19:56	1
Zinc	<0.0200		0.0200	0.00970	mg/L		09/18/24 09:00	09/18/24 19:56	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/18/24 09:00	09/18/24 19:56	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-433444/1-A
Matrix: Water
Analysis Batch: 434059

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433444

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/18/24 09:00	09/23/24 18:39	1
Magnesium	<0.500		0.500	0.150	mg/L		09/18/24 09:00	09/23/24 18:39	1
Manganese	<0.0100		0.0100	0.00360	mg/L		09/18/24 09:00	09/23/24 18:39	1
Molybdenum	<0.00200		0.00200	0.00130	mg/L		09/18/24 09:00	09/23/24 18:39	1

Lab Sample ID: MB 310-433444/1-A
Matrix: Water
Analysis Batch: 435361

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433444

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.100		0.100	0.0760	mg/L		09/18/24 09:00	10/04/24 13:44	1

Lab Sample ID: LCS 310-433444/2-A
Matrix: Water
Analysis Batch: 433630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.2016		mg/L		101	80 - 120
Barium	0.100	0.1055		mg/L		106	80 - 120
Boron	0.200	0.2101		mg/L		105	80 - 120
Cobalt	0.100	0.09078		mg/L		91	80 - 120
Copper	0.200	0.1873		mg/L		94	80 - 120
Iron	0.200	0.1971		mg/L		99	80 - 120
Lead	0.200	0.1963		mg/L		98	80 - 120
Zinc	0.200	0.1834		mg/L		92	80 - 120
Selenium	0.400	0.3920		mg/L		98	80 - 120

Lab Sample ID: LCS 310-433444/2-A
Matrix: Water
Analysis Batch: 434059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	0.100	0.09284		mg/L		93	80 - 120
Lead	0.200	0.2047		mg/L		102	80 - 120
Magnesium	2.00	2.051		mg/L		103	80 - 120
Manganese	0.100	0.1006		mg/L		101	80 - 120
Zinc	0.200	0.1871		mg/L		94	80 - 120

Lab Sample ID: LCS 310-433444/2-A
Matrix: Water
Analysis Batch: 435361

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	0.200	0.1958		mg/L		98	80 - 120
Molybdenum	0.200	0.1942		mg/L		97	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-433438/1
Matrix: Water
Analysis Batch: 433438

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	3.70	mg/L			09/17/24 15:55	1

Lab Sample ID: LCS 310-433438/2
Matrix: Water
Analysis Batch: 433438

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	103.0		mg/L		103	81 - 116

Lab Sample ID: MB 310-433449/1
Matrix: Water
Analysis Batch: 433449

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	3.70	mg/L			09/17/24 20:21	1

Lab Sample ID: LCS 310-433449/2
Matrix: Water
Analysis Batch: 433449

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	102.0		mg/L		102	81 - 116

HPLC/IC

Analysis Batch: 434244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	9056A	
310-290615-2	MW-4	Total/NA	Water	9056A	
310-290615-3	MW-5	Total/NA	Water	9056A	
310-290615-4	MW-6	Total/NA	Water	9056A	
310-290615-5	MW-7	Total/NA	Water	9056A	
310-290615-6	MW-D	Total/NA	Water	9056A	
MB 310-434244/3	Method Blank	Total/NA	Water	9056A	
LCS 310-434244/4	Lab Control Sample	Total/NA	Water	9056A	
310-290615-1 MS	MW-1	Total/NA	Water	9056A	
310-290615-1 MSD	MW-1	Total/NA	Water	9056A	

Metals

Prep Batch: 433444

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	3005A	
310-290615-2	MW-4	Total/NA	Water	3005A	
310-290615-3	MW-5	Total/NA	Water	3005A	
310-290615-4	MW-6	Total/NA	Water	3005A	
310-290615-5	MW-7	Total/NA	Water	3005A	
310-290615-6	MW-D	Total/NA	Water	3005A	
MB 310-433444/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-433444/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 433630

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	6020B	433444
310-290615-2	MW-4	Total/NA	Water	6020B	433444
310-290615-3	MW-5	Total/NA	Water	6020B	433444
310-290615-4	MW-6	Total/NA	Water	6020B	433444
310-290615-5	MW-7	Total/NA	Water	6020B	433444
310-290615-6	MW-D	Total/NA	Water	6020B	433444
MB 310-433444/1-A	Method Blank	Total/NA	Water	6020B	433444
LCS 310-433444/2-A	Lab Control Sample	Total/NA	Water	6020B	433444

Analysis Batch: 434059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	6020B	433444
310-290615-2	MW-4	Total/NA	Water	6020B	433444
310-290615-3	MW-5	Total/NA	Water	6020B	433444
310-290615-4	MW-6	Total/NA	Water	6020B	433444
310-290615-5	MW-7	Total/NA	Water	6020B	433444
MB 310-433444/1-A	Method Blank	Total/NA	Water	6020B	433444
LCS 310-433444/2-A	Lab Control Sample	Total/NA	Water	6020B	433444

Analysis Batch: 434205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-6	MW-D	Total/NA	Water	6020B	433444

QC Association Summary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Metals

Analysis Batch: 435361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	6020B	433444
310-290615-2	MW-4	Total/NA	Water	6020B	433444
310-290615-3	MW-5	Total/NA	Water	6020B	433444
310-290615-4	MW-6	Total/NA	Water	6020B	433444
310-290615-5	MW-7	Total/NA	Water	6020B	433444
MB 310-433444/1-A	Method Blank	Total/NA	Water	6020B	433444
LCS 310-433444/2-A	Lab Control Sample	Total/NA	Water	6020B	433444

General Chemistry

Analysis Batch: 433438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-2	MW-4	Total/NA	Water	I-3765-85	
310-290615-4	MW-6	Total/NA	Water	I-3765-85	
310-290615-5	MW-7	Total/NA	Water	I-3765-85	
MB 310-433438/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-433438/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 433449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290615-1	MW-1	Total/NA	Water	I-3765-85	
310-290615-3	MW-5	Total/NA	Water	I-3765-85	
310-290615-6	MW-D	Total/NA	Water	I-3765-85	
MB 310-433449/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-433449/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-1
Lab Sample ID: 310-290615-1
Date Collected: 09/12/24 12:50
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 10:02
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 19:08
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	435361	NFT2	EET CF	10/04/24 13:52
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 20:43
Total/NA	Analysis	I-3765-85		1	433449	MDU9	EET CF	09/17/24 20:21

Client Sample ID: MW-4
Lab Sample ID: 310-290615-2
Date Collected: 09/12/24 12:23
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 10:37
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 19:12
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	435361	NFT2	EET CF	10/04/24 13:55
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 20:45
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55

Client Sample ID: MW-5
Lab Sample ID: 310-290615-3
Date Collected: 09/12/24 11:59
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 10:48
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 19:15
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	435361	NFT2	EET CF	10/04/24 13:59
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 20:47
Total/NA	Analysis	I-3765-85		1	433449	MDU9	EET CF	09/17/24 20:21

Client Sample ID: MW-6
Lab Sample ID: 310-290615-4
Date Collected: 09/12/24 11:23
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 11:00
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 19:19

Lab Chronicle

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Client Sample ID: MW-6
Lab Sample ID: 310-290615-4
Date Collected: 09/12/24 11:23
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	435361	NFT2	EET CF	10/04/24 14:03
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 20:58
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55

Client Sample ID: MW-7
Lab Sample ID: 310-290615-5
Date Collected: 09/12/24 10:55
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 11:12
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	434059	NFT2	EET CF	09/23/24 19:23
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	435361	NFT2	EET CF	10/04/24 14:06
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 21:01
Total/NA	Analysis	I-3765-85		1	433438	MDU9	EET CF	09/17/24 15:55

Client Sample ID: MW-D
Lab Sample ID: 310-290615-6
Date Collected: 09/12/24 11:59
Matrix: Water
Date Received: 09/13/24 16:26

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	434244	HE7K	EET CF	09/24/24 11:46
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		5	434205	NFT2	EET CF	09/24/24 18:29
Total/NA	Prep	3005A			433444	F5MW	EET CF	09/18/24 09:00
Total/NA	Analysis	6020B		1	433630	NFT2	EET CF	09/18/24 21:03
Total/NA	Analysis	I-3765-85		1	433449	MDU9	EET CF	09/17/24 20:21

Laboratory References:
EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Method Summary

Client: SCS Engineers
Job ID: 310-290615-1
Project/Site: Corn Belt-Spencer CCR Landfill Sampling 2024

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-290615 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/13/24 | TIME 1626 | Received By: XB

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☒ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☐ Yes ☒ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: 2 | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.0 | Corrected Temp (°C): 1.0

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins

Client Information	Sampler: Konner Roth	Lab PM: Yang, Mary E	Carrier Tracking No(s):	COC No: 310-95836-23505 1
Client Contact: Kevin Jensen	Phone:	E-Mail: Mary Yang@ET EurofinsUS com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:

Address: 1690 All State Court Suite 100	Due Date Requested:	
City: West Des Moines	TAT Requested (days):	
State, Zip: IA, 50265	Compliance Project: Δ Yes Δ No	
Phone: 515-368-3155(Tel)	PO #: Purchase Order not required	
Email: kjensen@scsengineers com	WO #:	
Project Name: Corn Belt-Spencer CCR Landfill Sampling 2024	Project #: 31015090	
Site: Corn Belt-Spencer CCR Landfill	SSOW#:	

Analysis Requested

Preservation Codes:
N - None
D - HNO3
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A_ORGFM_28D - (MOD) Chloride and Sulfate Flouride	6020B - (MOD) Metals List	I_3765_85 - Residue, Non-filterable (TSS)	6020 - Selenium	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	N			
MW-1	9-12-24	1250	G	Water			X	X	X			Metals List: As, Ba, Bo Cd Co, Cu, Fe, Pb, Mg, Mn, Zn
MW-4	9-12-24	1223	G	Water			X	X	X			
MW-5	9-12-24	1159	G	Water			X	X	X			
MW-6	9-12-24	1123	G	Water			X	X	X			
MW-7	9-12-24	1055	G	Water			X	X	X	X		
MW-D	9-12-24	1159	G	Water			X	X	X			

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time.	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by: Konner Roth	9-13-24 / 10:00	SCS	CGC	9-13-24 1620	Eurofins
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Ver 05/06/2024

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-290615-1

Login Number: 290615
List Number: 1
Creator: Collins, Charlotte G

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B-2

Data Validation

Site Name: Corn Belt Power Cooperative - Wisdom Station CCR Landfill
Completed by: Semir Omerovic
Lab Report Date: 10/7/2024
Sampling Date: 9/12/2024
Lab Report Number: 310-290615-1

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			
Condition	X			
Case Narrative	X			
Reporting Limits		X		Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: MW-1 (310-265480-1), MW-6 (310-265480-4) and MW-7 (310-265480-5). Elevated reporting limits (RLs) were provided.
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			
Trip Blank Detections			X	
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)			X	
Precision				
QA/QC Sample RPDs	X			
Field Duplicates	X			The duplicate sample was collected from MW-5 during the 2024 sampling event. All parameters had <50% relative difference. Constituents with J flag concentrations were not considered for the duplicate sample comparisons.

Appendix C

Summary of Groundwater Chemistry

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Summary of Groundwater Chemistry

Corn Belt Power Cooperative - Wisdom Station CCR Landfill (21-SPD-04-95C)

Total Metals Constituents	Sample Date	MW-4 UPG	MW-1 DNG	MW-5 DNG	MW-6 DNG	MW-7 DNG
Arsenic, mg/L (CAS NO - 7440-38-2)	9/20/2016	**0.0032**	< 0.002	< 0.002	**0.00606**	**0.00262**
	9/21/2017	**0.0038**	**0.00485**	< 0.002	**0.00309**	**0.00261**
	9/17/2018	**0.00498**	**0.00576**	**0.008**	**0.00548**	**0.016**
	9/10/2019	**0.00419**	**0.00416**	N/A	**0.00768**	**0.00208**
	9/16/2020	**0.00303**	< 0.002	< 0.002	**0.00585**	< 0.002
	9/13/2021	**0.00353**	< 0.002	< 0.002	**0.00538**	**0.00224**
	9/27/2022	**0.00533**	**0.00386**	0.000806*	**0.0134**	**0.00288**
	9/27/2022	N/A	N/A	0.00112*	N/A	N/A
	9/19/2023	**0.00432**	0.000759*	0.0011*	**0.00278**	0.00192*
	9/19/2023	N/A	N/A	0.00087*	N/A	N/A
	9/12/2024	**0.00477**	0.00104*	0.000884*	**0.00242**	**0.00246**
	9/12/2024	N/A	N/A	0.00104*	N/A	N/A
Barium, mg/L (CAS NO - 7440-39-3)	9/20/2016	**0.0957**	**0.0549**	**0.0814**	**0.16**	**0.218**
	9/21/2017	**0.115**	**0.206**	**0.179**	**0.105**	**0.407**
	9/17/2018	**0.157**	**0.137**	**0.312**	**0.198**	**0.43**
	9/10/2019	**0.184**	**0.166**	N/A	**0.433**	**0.322**
	9/16/2020	**0.108**	**0.183**	**0.721**	**0.332**	**0.401**
	9/13/2021	**0.0855**	**0.0936**	**0.131**	**0.256**	**0.287**
	9/27/2022	**0.133**	**0.18**	**0.173**	**0.406**	**0.234**
	9/27/2022	N/A	N/A	**0.173**	N/A	N/A
	9/19/2023	**0.092**	**0.0577**	**0.0397**	**0.102**	**0.0814**
	9/19/2023	N/A	N/A	**0.0384**	N/A	N/A
	9/12/2024	**0.153**	**0.0511**	**0.0381**	**0.116**	**0.083**
	9/12/2024	N/A	N/A	**0.0331**	N/A	N/A
Beryllium, mg/L (CAS NO - 7440-41-7)	9/20/2016	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	9/21/2017	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	9/17/2018	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	9/10/2019	< 0.001	< 0.001	N/A	< 0.001	< 0.001
	9/16/2020	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	9/13/2021	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Boron, mg/L (CAS NO - 7440-42-8)	9/27/2022	**0.116**	**0.365**	**0.226**	< 0.7	**4.47**
	9/27/2022	N/A	N/A	**0.206**	N/A	N/A
	9/19/2023	< 0.1	0.0899*	**0.107**	0.0907*	**2.86**
	9/19/2023	N/A	N/A	0.0812*	N/A	N/A
	9/12/2024	**0.102**	**0.159**	< 0.5	**0.131**	**3.84**
	9/12/2024	N/A	N/A	**0.16**	N/A	N/A
Cadmium, mg/L (CAS NO - 7440-43-9)	9/20/2016	< 0.0005	**0.000671**	< 0.0005	< 0.0005	< 0.0005
	9/21/2017	< 0.0005	**0.00068**	< 0.0005	< 0.0005	**0.000979**
	9/17/2018	< 0.0005	**0.000522**	< 0.002	< 0.0005	< 0.004
	9/10/2019	**0.000108**	**0.000813**	N/A	**0.00067**	**0.000623**
	9/16/2020	< 0.0001	**0.000884**	**0.000588**	**0.000474**	**0.000788**
	9/13/2021	< 0.0001	**0.000367**	**0.00016**	**0.000321**	**0.000382**
	9/27/2022	**0.000145**	**0.000868**	**0.000193**	**0.000549**	**0.000375**
	9/27/2022	N/A	N/A	**0.000207**	N/A	N/A
	9/19/2023	< 0.0002	0.00012*	< 0.0002	< 0.0002	0.000154*
	9/19/2023	N/A	N/A	< 0.0002	N/A	N/A
	9/12/2024	< 0.0002	< 0.0002	**0.00166**	**0.000215**	< 0.0002
	9/12/2024	N/A	N/A	< 0.0002	N/A	N/A

SCS ENGINEERS

Summary of Groundwater Chemistry

Corn Belt Power Cooperative - Wisdom Station CCR Landfill (21-SPD-04-95C)

Total Metals Constituents	Sample Date	MW-4 UPG	MW-1 DNG	MW-5 DNG	MW-6 DNG	MW-7 DNG
Chloride, mg/L (CAS NO - 16887-00-6)	9/20/2016	**17.1**	< 5	**11.3**	**13.4**	**18.1**
	9/21/2017	**22.3**	**15.1**	**15.8**	**13.5**	**22.5**
	9/17/2018	**61.1**	< 5	**7.66**	**12.1**	**21.6**
	9/10/2019	**12.6**	< 5	N/A	**13.2**	**22.4**
	9/16/2020	**19.7**	**11**	**12.1**	**14.4**	**29.4**
	9/13/2021	**16.6**	**13.8**	**18.3**	**14.1**	**14.2**
	9/27/2022	**21.3**	**15**	**26.7**	**21.2**	**18.8**
	9/27/2022	N/A	N/A	**26.4**	N/A	N/A
	9/19/2023	**19.5**	**16.1**	**26.3**	**18.2**	**19.8**
	9/19/2023	N/A	N/A	**26.2**	N/A	N/A
	9/12/2024	**26.8**	**5.03**	**25.6**	**20**	**22.3**
	9/12/2024	N/A	N/A	**25.1**	N/A	N/A
Cobalt, mg/L (CAS NO - 7440-48-4)	9/20/2016	**0.000587**	**0.0103**	< 0.0005	**0.00318**	**0.00391**
	9/21/2017	< 0.0005	**0.0113**	< 0.0005	**0.00127**	**0.00426**
	9/17/2018	**0.000552**	**0.00535**	**0.00372**	**0.00427**	**0.0481**
	9/10/2019	**0.00131**	**0.00674**	N/A	**0.00628**	**0.00949**
	9/16/2020	< 0.0005	**0.00481**	**0.000971**	**0.00249**	**0.00175**
	9/13/2021	< 0.0005	**0.00178**	< 0.0005	**0.00153**	**0.00427**
	9/27/2022	0.000461*	**0.0062**	0.00047*	**0.00885**	**0.00971**
	9/27/2022	N/A	N/A	**0.0012**	N/A	N/A
	9/19/2023	0.000223*	0.000198*	0.0002*	**0.000799**	**0.00199**
	9/19/2023	N/A	N/A	< 0.0005	N/A	N/A
	9/12/2024	< 0.0005	< 0.0005	0.000293*	0.000437*	**0.00172**
	9/12/2024	N/A	N/A	0.000267*	N/A	N/A
Copper, mg/L (CAS NO - 7440-50-8)	9/20/2016	< 0.005	**0.0139**	< 0.005	< 0.005	**0.00721**
	9/21/2017	< 0.005	**0.0178**	< 0.005	< 0.005	**0.0105**
	9/17/2018	< 0.005	**0.0112**	< 0.02	< 0.005	< 0.04
	9/10/2019	< 0.005	**0.013**	N/A	< 0.005	**0.00706**
	9/16/2020	< 0.005	**0.0133**	**0.00772**	< 0.005	**0.00727**
	9/13/2021	< 0.005	**0.00561**	< 0.005	< 0.005	**0.00501**
	9/27/2022	0.00496*	**0.0137**	0.00245*	0.00453*	0.0049*
	9/27/2022	N/A	N/A	0.00282*	N/A	N/A
	9/19/2023	< 0.005	0.00181*	< 0.005	< 0.005	0.00196*
	9/19/2023	N/A	N/A	< 0.005	N/A	N/A
	9/12/2024	< 0.005	< 0.005	0.0018*	< 0.005	0.00184*
	9/12/2024	N/A	N/A	< 0.005	N/A	N/A
Fluoride, mg/L (CAS NO - 16984-48-8)	9/27/2022	< 0.5	< 0.5	0.305*	< 0.5	< 0.5
	9/27/2022	N/A	N/A	0.303*	N/A	N/A
	9/19/2023	< 1	< 1	0.553*	< 1	< 1
	9/19/2023	N/A	N/A	0.54*	N/A	N/A
	9/12/2024	0.383*	< 1	0.655*	< 1	< 1
	9/12/2024	N/A	N/A	0.665*	N/A	N/A
Iron, Total, mg/L (CAS NO - 7439-89-6)	9/20/2016	**0.308**	**8.24**	**1.56**	**2.35**	**2.08**
	9/21/2017	**1.32**	**16.3**	**0.869**	**1.02**	**1.09**
	9/17/2018	**2.72**	**12.5**	**4.22**	**4.77**	**4.84**
	9/10/2019	**3.07**	**16.5**	N/A	**3.79**	**1.15**
	9/16/2020	**1.33**	**4.9**	**0.576**	**2.43**	**0.191**
	9/13/2021	**1.52**	**2.97**	**0.117**	**2.16**	**0.56**
	9/27/2022	**2.11**	**13.6**	**0.212**	**6.11**	**1.77**
	9/27/2022	N/A	N/A	**1.05**	N/A	N/A
	9/19/2023	**1.02**	**0.379**	**0.192**	**0.527**	0.0976*
	9/19/2023	N/A	N/A	**0.125**	N/A	N/A
	9/12/2024	**3.75**	0.0417*	**0.14**	**0.214**	**0.401**
	9/12/2024	N/A	N/A	**0.177**	N/A	N/A

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Summary of Groundwater Chemistry

Corn Belt Power Cooperative - Wisdom Station CCR Landfill (21-SPD-04-95C)

Total Metals Constituents	Sample Date	MW-4 UPG	MW-1 DNG	MW-5 DNG	MW-6 DNG	MW-7 DNG
Lead, mg/L (CAS NO - 7439-92-1)	9/20/2016	**0.000752**	**0.00767**	**0.000567**	**0.00223**	< 0.0005
	9/21/2017	**0.000699**	**0.0104**	< 0.0005	**0.000913**	< 0.0005
	9/17/2018	**0.00212**	**0.00525**	< 0.002	**0.00223**	< 0.004
	9/10/2019	**0.00455**	**0.00695**	N/A	< 0.0005	< 0.0005
	9/16/2020	**0.00147**	**0.00199**	< 0.0005	< 0.0005	< 0.0005
	9/13/2021	**0.000612**	**0.00107**	< 0.0005	< 0.0005	< 0.0005
	9/27/2022	**0.00139**	**0.00584**	< 0.0005	**0.00155**	0.000261*
	9/27/2022	N/A	N/A	0.000328*	N/A	N/A
	9/19/2023	0.000427*	< 0.0005	< 0.0005	0.000278*	< 0.0005
	9/19/2023	N/A	N/A	< 0.0005	N/A	N/A
	9/12/2024	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	9/12/2024	N/A	N/A	< 0.0005	N/A	N/A
Magnesium, mg/L (CAS NO - 7439-95-4)	9/20/2016	**18.5**	**38.1**	**29.9**	**30.8**	**35.6**
	9/21/2017	**30.1**	**37.4**	**28.6**	**26.4**	**36.5**
	9/17/2018	**34.5**	**24**	**34.3**	**29.3**	**44.5**
	9/10/2019	**31.6**	**19.4**	N/A	**23.6**	**35.4**
	9/16/2020	**24.2**	**29.9**	**29**	**23.5**	**44.3**
	9/13/2021	**22.3**	**24**	**27.5**	**25.3**	**27.5**
	9/27/2022	**32.4**	**35.8**	**41.7**	**26.8**	**37.3**
	9/27/2022	N/A	N/A	**41.8**	N/A	N/A
	9/19/2023	**21.9**	**22**	**41.5**	**23.8**	**28**
	9/19/2023	N/A	N/A	**35.3**	N/A	N/A
	9/12/2024	**38.3**	**16.5**	**35**	**26.5**	**28.7**
	9/12/2024	N/A	N/A	**33.1**	N/A	N/A
Manganese, mg/L (CAS NO - 7439-96-5)	9/20/2016	**0.113**	**2.6**	**0.385**	**1.17**	**1.56**
	9/21/2017	**0.235**	**2.15**	**1**	**26.4**	**2.72**
	9/17/2018	**0.226**	**1.48**	**9.06**	**2.22**	**16.5**
	9/10/2019	**0.326**	**2.19**	N/A	**4.26**	**3.06**
	9/16/2020	**0.254**	**1.91**	**3.62**	**1.98**	**1.7**
	9/13/2021	**0.271**	**0.816**	**0.543**	**1.56**	**1.69**
	9/27/2022	**0.272**	**2.7**	**1.52**	**6.83**	**2.66**
	9/27/2022	N/A	N/A	**3.13**	N/A	N/A
	9/19/2023	**0.196**	**0.153**	**0.272**	**0.649**	**1.12**
	9/19/2023	N/A	N/A	**0.215**	N/A	N/A
	9/12/2024	**0.387**	**0.0273**	**0.701**	**0.483**	**1.07**
	9/12/2024	N/A	N/A	**0.502**	N/A	N/A
Molybdenum, mg/L (CAS NO - 7439-98-7)	9/27/2022	0.00156*	0.00137*	< 0.002	**0.0111**	**0.0219**
	9/27/2022	N/A	N/A	**0.0075**	N/A	N/A
	9/19/2023	**0.00202**	< 0.002	**0.00988**	**0.00423**	**0.0854**
	9/19/2023	N/A	N/A	**0.00997**	N/A	N/A
	9/12/2024	**0.00209**	0.00181*	**0.0227**	**0.00624**	**0.0664**
	9/12/2024	N/A	N/A	**0.0127**	N/A	N/A
Selenium, mg/L (CAS NO - 7782-49-2)	9/20/2016	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	9/21/2017	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	9/17/2018	< 0.005	< 0.005	< 0.02	< 0.005	< 0.005
	9/10/2019	< 0.005	< 0.005	N/A	< 0.005	< 0.005
	9/16/2020	< 0.005	< 0.005	< 0.005	< 0.005	**0.0128**
	9/13/2021	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
	9/27/2022	N/A	N/A	N/A	N/A	**0.00629**
	9/19/2023	N/A	N/A	N/A	N/A	< 0.005
	9/12/2024	N/A	N/A	N/A	N/A	0.0035*

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Summary of Groundwater Chemistry

Corn Belt Power Cooperative - Wisdom Station CCR Landfill (21-SPD-04-95C)

Total Metals Constituents	Sample Date	MW-4 UPG	MW-1 DNG	MW-5 DNG	MW-6 DNG	MW-7 DNG
Sulfate, mg/L (CAS NO - 14808-79-8)	9/20/2016	**44.6**	**10.2**	**37.1**	**51.9**	**162**
	9/21/2017	**78.3**	**49.3**	**95.9**	**79.9**	**197**
	9/17/2018	**94.9**	**16.5**	**82.4**	**62.4**	**270**
	9/10/2019	**48.9**	**11**	N/A	**66.3**	**237**
	9/16/2020	**53.8**	**36.5**	**63**	**74.4**	**353**
	9/13/2021	**51.4**	**50.3**	**96.2**	**145**	**94.2**
	9/27/2022	**61.6**	**48.4**	**122**	**116**	**239**
	9/27/2022	N/A	N/A	**121**	N/A	N/A
	9/19/2023	**47.6**	**48.6**	**113**	**103**	**207**
	9/19/2023	N/A	N/A	**114**	N/A	N/A
	9/12/2024	**58**	**13.6**	**97.5**	**93.1**	**175**
	9/12/2024	N/A	N/A	**94.3**	N/A	N/A
Zinc, mg/L (CAS NO - 7440-66-6)	9/20/2016	**0.104**	**0.0407**	**0.0117**	**0.0522**	**0.0122**
	9/21/2017	**0.109**	**0.0585**	**0.0564**	**0.0497**	< 0.02
	9/17/2018	**0.112**	**0.0762**	**0.101**	**0.0815**	< 0.16
	9/10/2019	**0.209**	**0.0859**	N/A	**0.218**	< 0.02
	9/16/2020	**0.175**	**0.0217**	**0.139**	**0.117**	**0.0922**
	9/13/2021	**0.143**	**0.0352**	**0.0426**	**0.132**	< 0.02
	9/27/2022	**0.193**	**0.0661**	**0.0777**	**0.189**	< 0.02
	9/27/2022	N/A	N/A	**0.0766**	N/A	N/A
	9/19/2023	**0.057**	0.00972*	< 0.02	0.0177*	0.00973*
	9/19/2023	N/A	N/A	< 0.02	N/A	N/A
	9/12/2024	< 0.02	< 0.02	< 0.02	**0.025**	< 0.02
	9/12/2024	N/A	N/A	< 0.02	N/A	N/A
Total Suspended Solids, mg/L (CAS NO - TSS)	9/27/2022	**61**	**264**	**115**	**160**	**73**
	9/27/2022	N/A	N/A	**176**	N/A	N/A
	9/19/2023	**14.3**	**8.13**	1.25*	**20.8**	**4.62**
	9/19/2023	N/A	N/A	**11.4**	N/A	N/A
	9/12/2024	**20.8**	**3.75**	< 1.88	**5.88**	**4.38**
	9/12/2024	N/A	N/A	**19.7**	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

Appendix D

Statistical Report

STATISTICAL METHODOLOGY

Statistical Method

The approved Groundwater Assessment Plan Update (Doc #79942) proposed the use of parametric and non-parametric prediction limits for statistical evaluation in lieu of the control limits required by Iowa Administrative Code 567-103. Prediction limits are the recommended approach of the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance," as published by the United States Environmental Protection Agency. Prediction limits are used for the statistical evaluation during this reporting period.

Diagnostic and Exploratory Evaluations and Tests of Assumptions

The statistical program includes diagnostic and exploratory evaluations and statistical tests of assumptions, as appropriate, including the following:

- Time series plots
- Ohio EPA Method for Outliers

Management of Non-Detect Data

Non-detect values in the dataset are managed using simple substitution or the Kaplan-Meier estimator. If less than 15% of the data are non-detects, simple substitution is used, where non-detect values are assigned a concentration of one-half (½) of the practical quantification limit (PQL). If greater than 15% but less than 50% of the data are non-detects, the Kaplan-Meier estimator is used to define the distribution for the dataset. If non-detects comprise greater than 50% of the available data, non-parametric statistical methods are used.

Management of Outliers

Background datasets are evaluated for outliers using the Ohio EPA Method as included in the statistical software program Sanitas™ and described below, which included the use of Dixon's, Rosner's, and Tukey's outlier tests, as appropriate based on the diagnostic tests, for the datasets containing less than 75% of the measured concentrations below the practical quantification limit (PQL).

Management of Data (ND data < 75%)

If less than 75% of the background dataset is below the PQL, outliers are statistically evaluated using the following guidelines.

- Parametric datasets with $n < 20$ are evaluated using Dixon's outlier test.
- Parametric datasets with $n \geq 20$ are evaluated using Rosner's outlier test.
- Non-parametric datasets are evaluated using Tukey's outlier test.

In accordance with the Ohio EPA Method, if a statistically significant outlier is not found using the above tests, but the highest value data point exceeded the second highest data point by an order of magnitude, the highest point is considered an outlier.

Management of Data (ND data ≥ 75%)

If greater than or equal to 75% of the background dataset is less than the PQL, outliers are statistically evaluated using the following guidelines.

- Single detection ≥ PQL:
  - If ≥ 50% of the background dataset has detections ≥ method detection limit (MDL), any value ≥ two times PQL of background is considered an outlier.
  - If < 50% of the background dataset has detections ≥ MDL, any value ≥ PQL of background is considered an outlier.
- Two or more detections ≥ PQL:
  - If ≥ 50% of the background dataset has detections ≥ MDL, any value ≥ three times PQL of background is considered an outlier.
  - If < 50% of the background dataset has detections ≥ MDL, any value ≥ two times the PQL of background is considered an outlier.

Interwell Prediction Limits

Interwell prediction limits were selected as the appropriate statistical method for the determination of constituents statistically above background. Prediction limits are established using the process below. Data from the most recent sampling events is compared to the prediction limits for the determination of constituents above background.

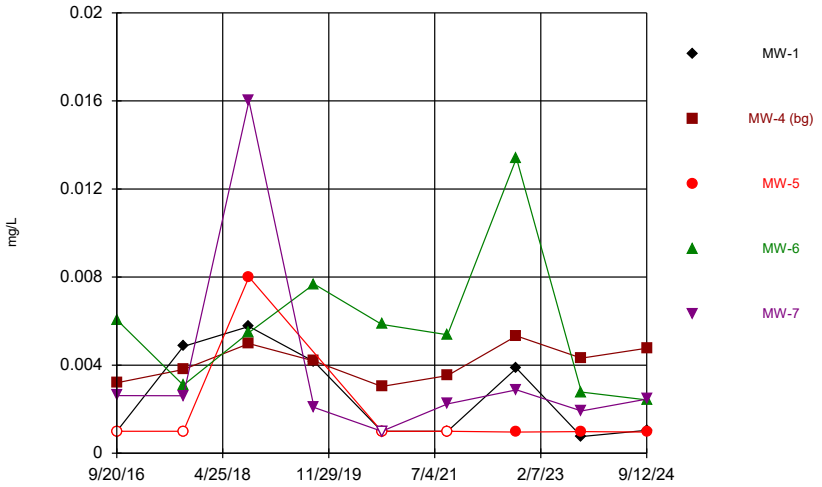
- If the dataset has a normal distribution (or could be transformed to a normal distribution using Ladder of Powers) and has less than 50% non-detects, parametric interwell prediction limits are calculated if at least five data sets had been collected.
- If the dataset did not have a normal distribution (and could not be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, non-parametric interwell prediction limits are calculated if at least five data sets had been collected.

Attachment A

Time Series Graphs

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

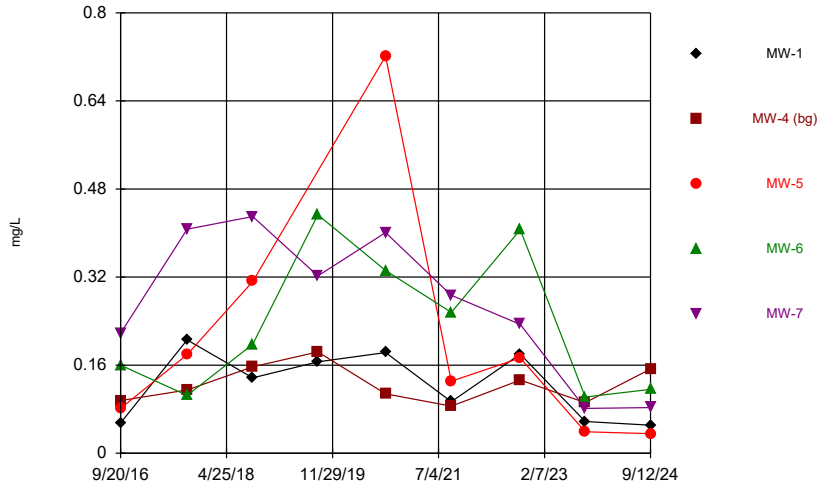
Time Series



Constituent: Arsenic Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Time Series



Constituent: Barium Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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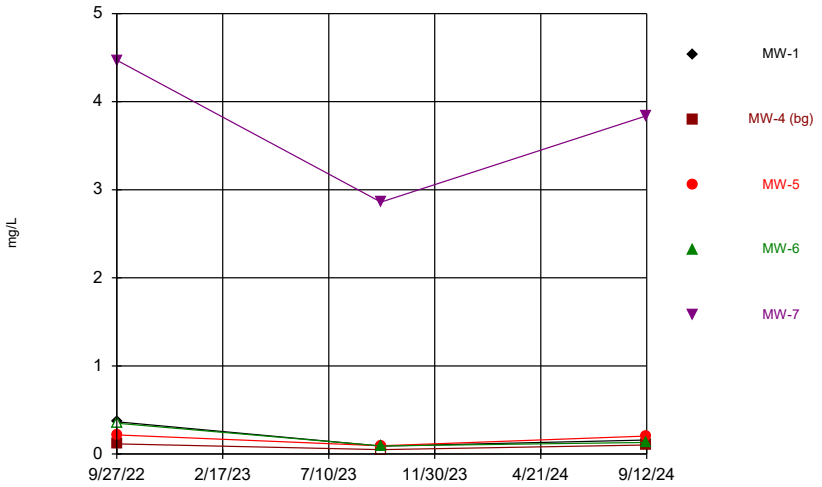
Hollow symbols indicate censored values.

Time Series



Constituent: Boron Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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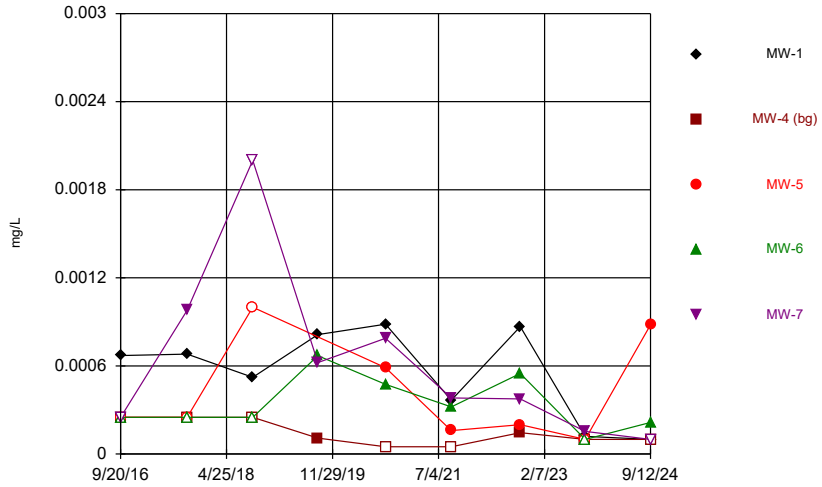
Hollow symbols indicate censored values.

Time Series



Constituent: Cadmium Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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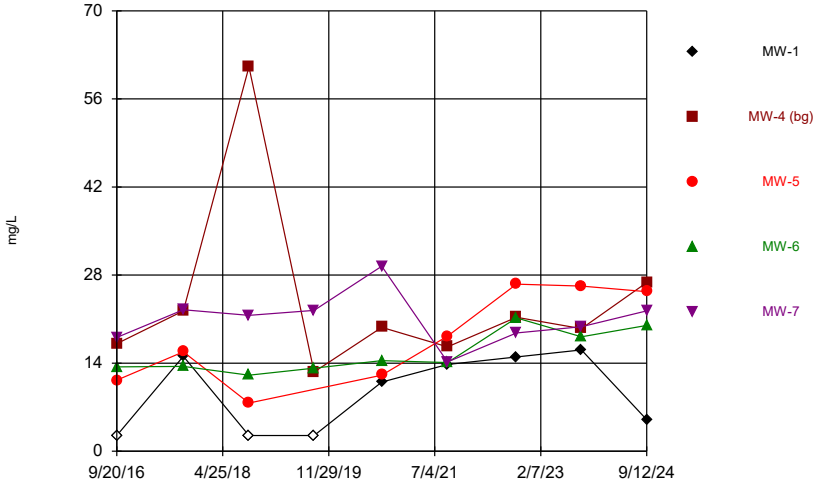
Hollow symbols indicate censored values.

Time Series



Constituent: Chloride Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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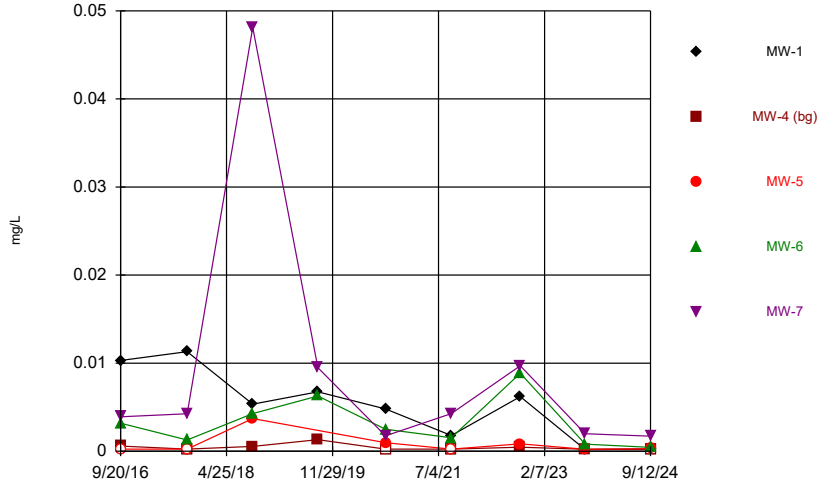
Hollow symbols indicate censored values.

Time Series



Constituent: Cobalt Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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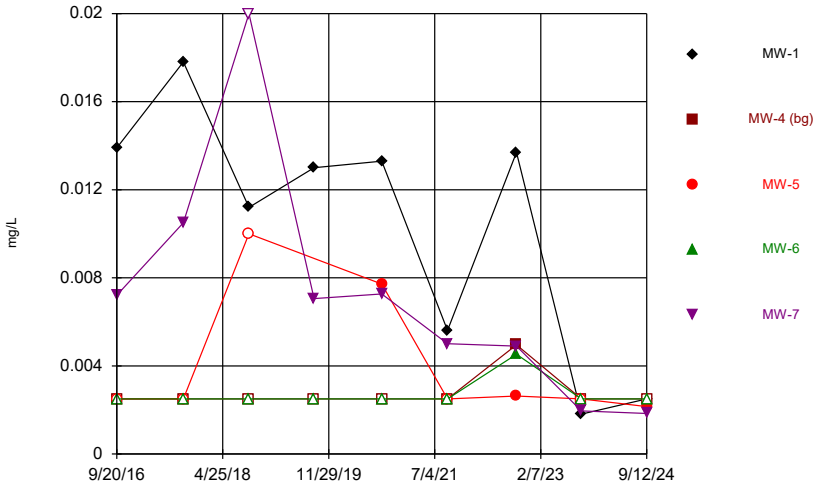
Hollow symbols indicate censored values.

Time Series



Constituent: Copper Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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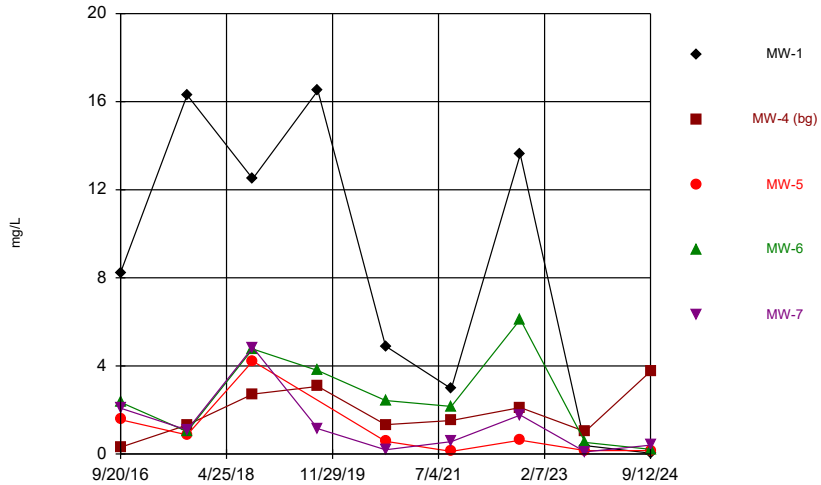
Time Series



Constituent: Iron Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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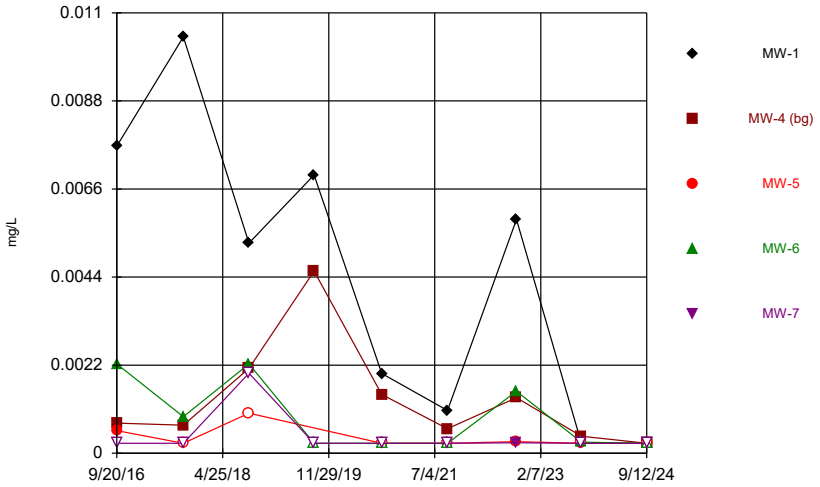
Hollow symbols indicate censored values.

Time Series



Constituent: Lead Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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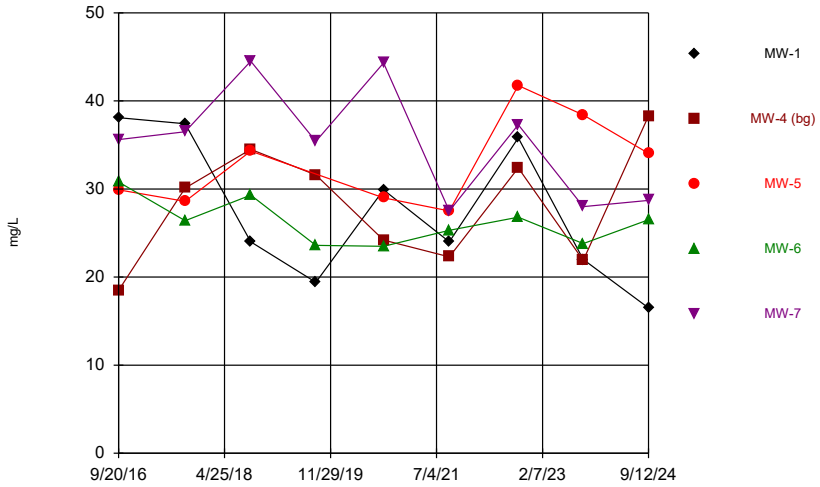
Time Series



Constituent: Magnesium Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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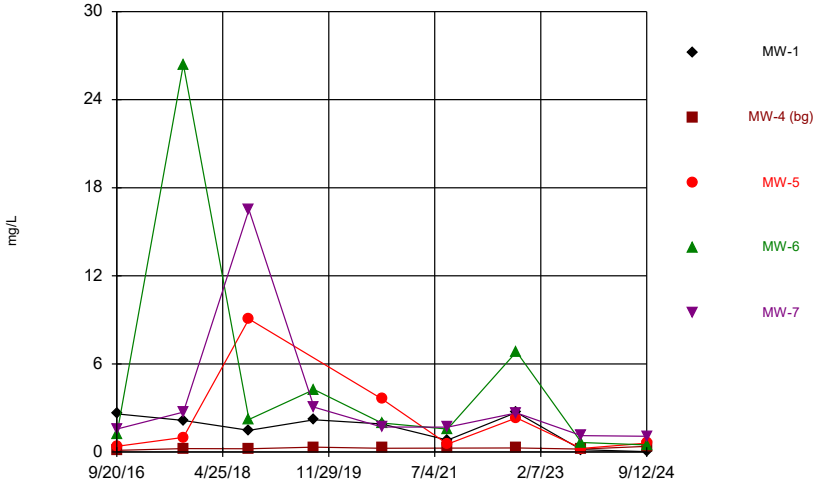
Time Series



Constituent: Manganese Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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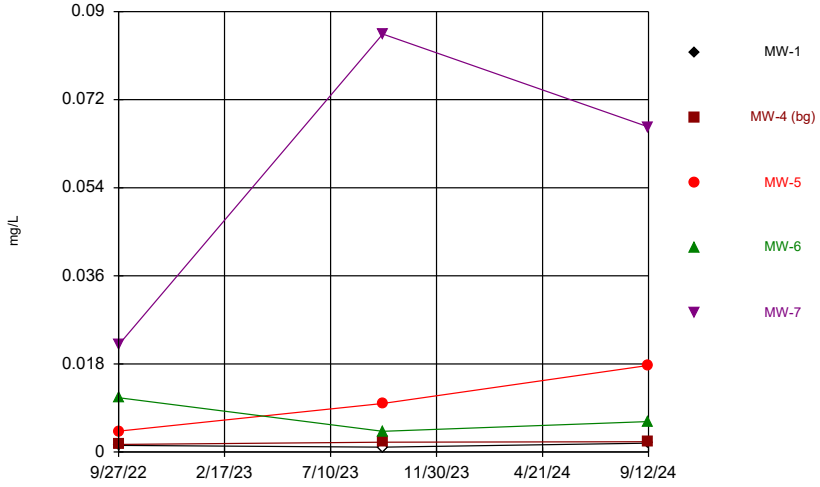
Hollow symbols indicate censored values.

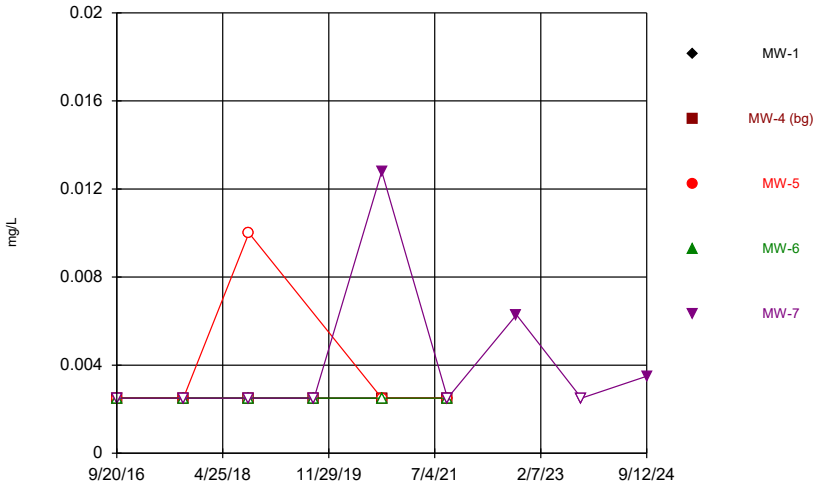
Time Series



Constituent: Molybdenum Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Time Series



Constituent: Selenium Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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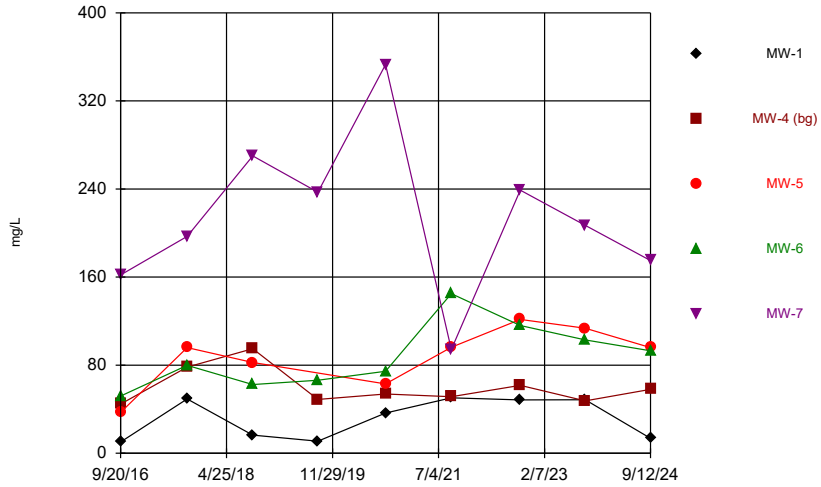
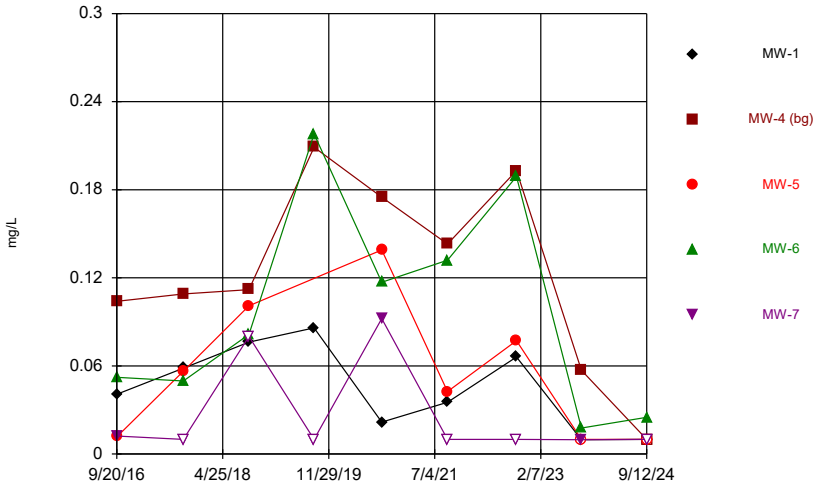
Time Series



Constituent: Sulfate Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Time Series



Constituent: Zinc Analysis Run 10/23/2024 5:58 PM View: 2024AWQR - Time Series
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Attachment B

Outliers

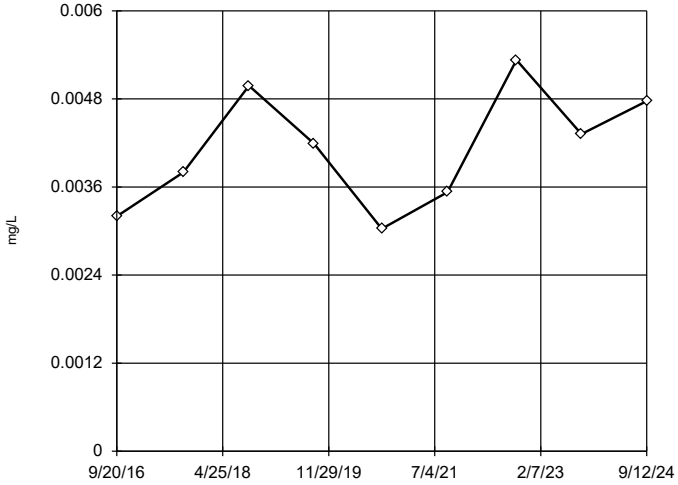
BG Outlier Analysis

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP Printed 10/24/2024, 12:32 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Arsenic (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA/OH	0.05	9	0.004128	0.0008028	normal	ShapiroWilk
Barium (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA/OH	0.05	9	0.1248	0.034	normal	ShapiroWilk
Cadmium (mg/L)	**MW-4 (bg)**	**Yes**	**0.00025,0.00025,0.00025**	**9/20/2016,9/21/2017,9/17/2018**	**OH**	**NaN**	**9**	**0.0001448**	**0.00008407**	**n/a**	**n/a**
Chloride (mg/L)	**MW-4 (bg)**	**Yes**	**61.1**	**9/17/2018**	**Dixon/OH**	**0.05**	**9**	**24.11**	**14.43**	**normal**	**ShapiroWilk**
Cobalt (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	9	0.0004592	0.0003499	unknown	ShapiroWilk
Copper (mg/L)	**MW-4 (bg)**	**Yes**	**0.00496**	**9/27/2022**	**OH**	**NaN**	**9**	**0.002773**	**0.00082**	**n/a**	**n/a**
Iron (mg/L)	MW-4 (bg)	No	n/a	n/a	Dixon/OH	0.05	9	1.905	1.097	normal	ShapiroWilk
Lead (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA/OH	0.05	9	0.001363	0.001334	ln(x)	ShapiroWilk
Magnesium (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA/OH	0.05	9	28.2	6.7	normal	ShapiroWilk
Manganese (mg/L)	MW-4 (bg)	No	n/a	n/a	Dixon/OH	0.05	9	0.2533	0.07736	normal	ShapiroWilk
Sulfate (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA/OH	0.05	9	59.9	16.53	normal	ShapiroWilk
Zinc (mg/L)	MW-4 (bg)	No	n/a	n/a	Dixon/OH	0.05	9	0.1236	0.06442	normal	ShapiroWilk

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.004128, std. dev. 0.0008028, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9611
Critical = 0.829
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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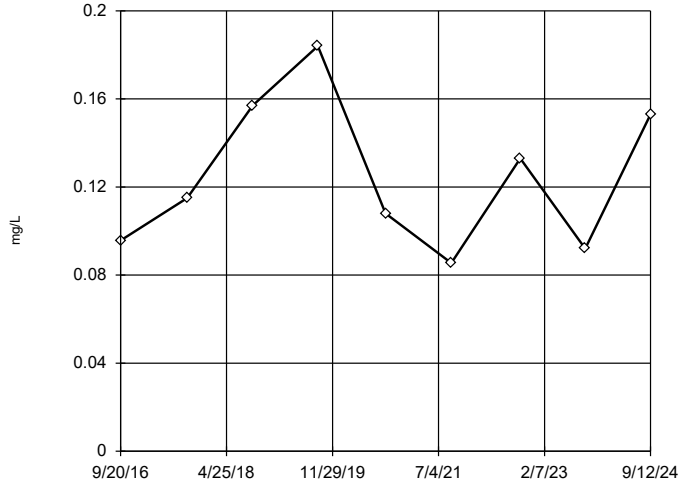
EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)



n = 9

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.1248, std. dev. 0.034, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9305
Critical = 0.829
The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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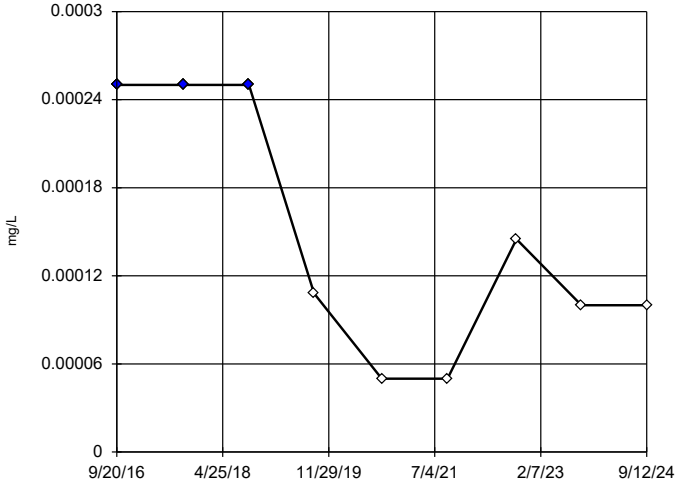
Ohio EPA 0715 Outlier Algorithm

MW-4 (bg)



n = 9

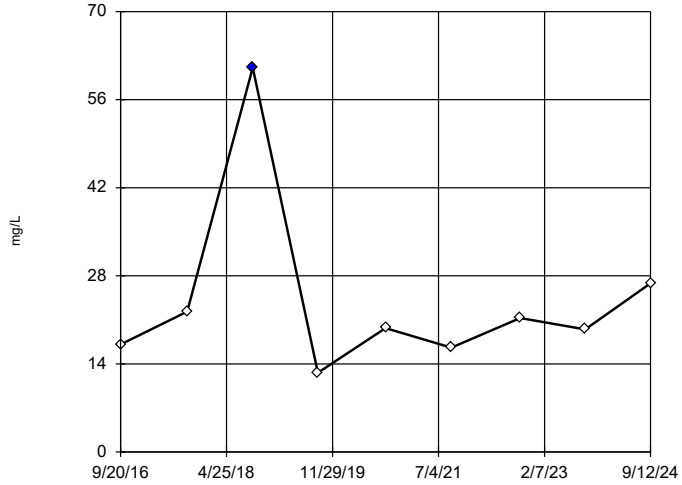
Statistical outliers are drawn as solid.
Outliers per Ohio method.

Constituent: Cadmium Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-4 (bg)



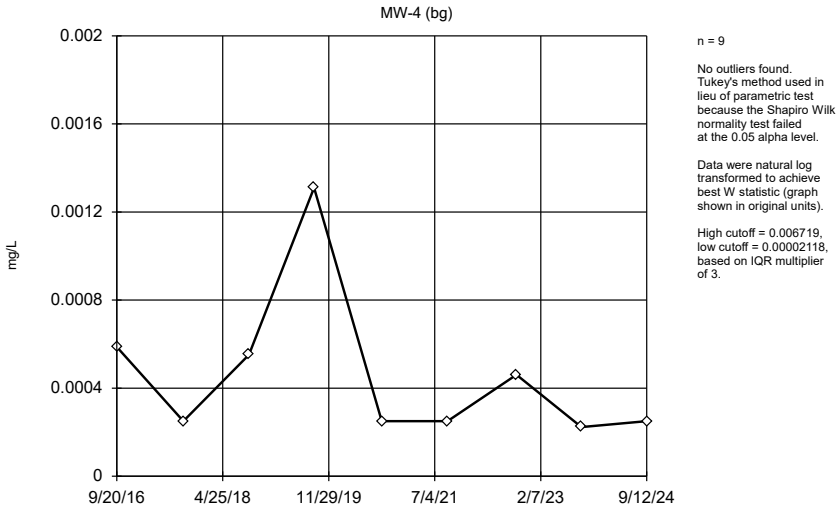
n = 9

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 24.11.
Std. Dev. = 14.43.
61.1: c = 0.7708
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9836
Critical = 0.818
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Chloride Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 9

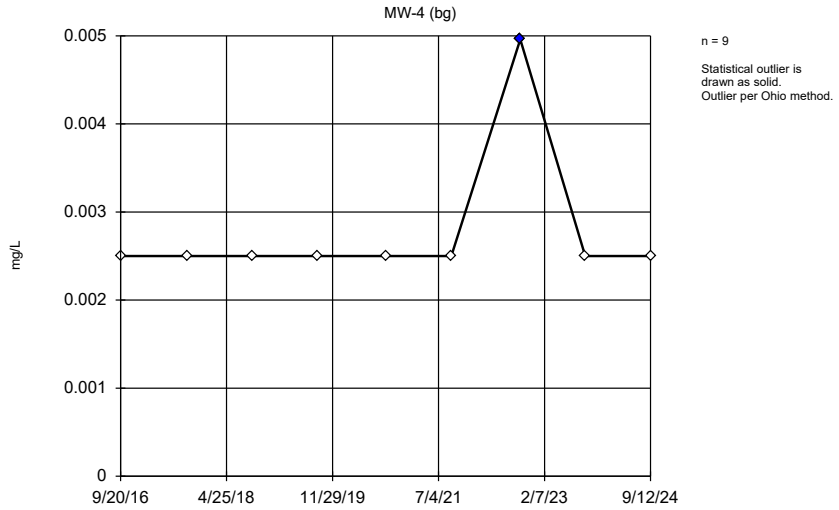
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.05 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.006719, low cutoff = 0.00002118, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Ohio EPA 0715 Outlier Algorithm

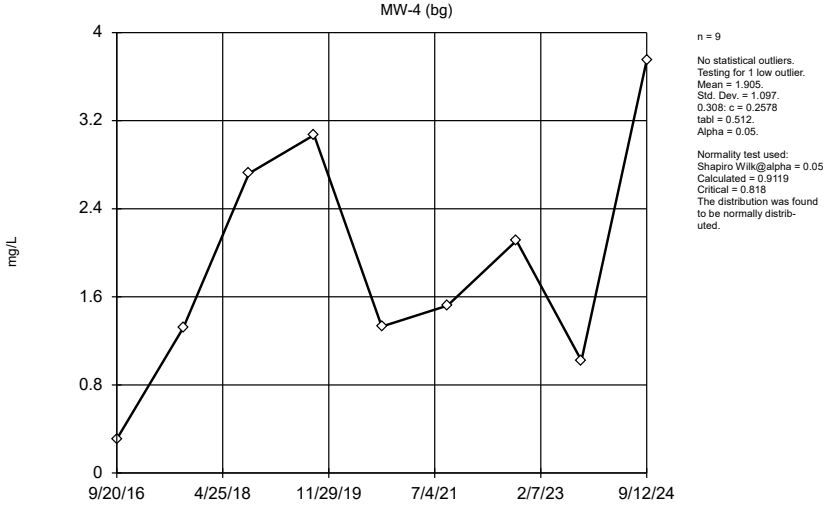


n = 9

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Copper Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm



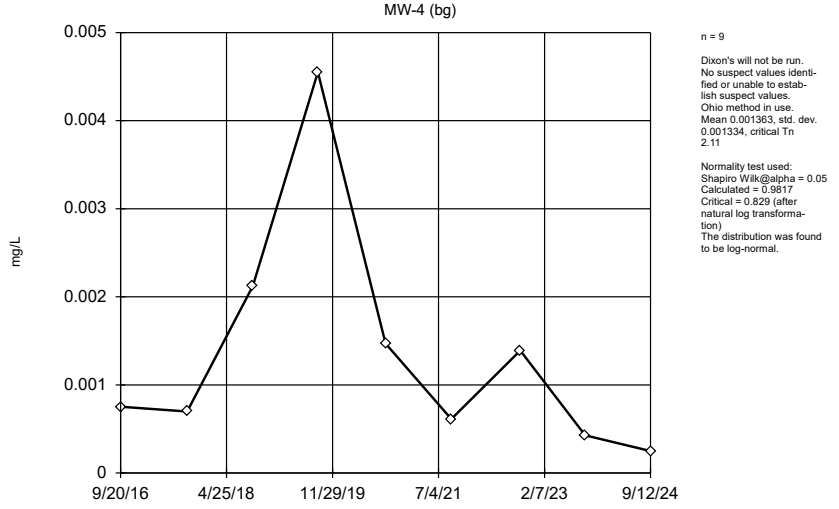
n = 9

No statistical outliers.
Testing for 1 low outlier.
Mean = 1.905.
Std. Dev. = 1.097.
0.308: c = 0.2578
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9119
Critical = 0.818
The distribution was found to be normally distributed.

Constituent: Iron Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

EPA Screening (suspected outliers for Dixon's Test)



n = 9

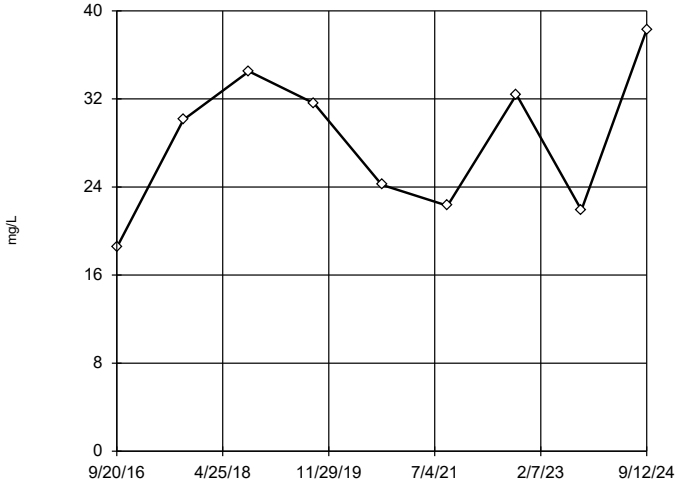
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001363, std. dev. 0.001334, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9817
Critical = 0.829 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Lead Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)



n = 9

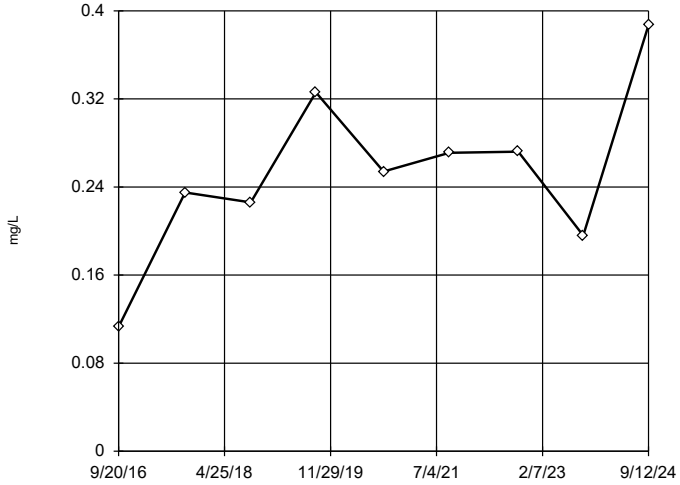
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 28.2, std. dev. 6.7, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9471
Critical = 0.829
The distribution was found to be normally distributed.

Constituent: Magnesium Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-4 (bg)



n = 9

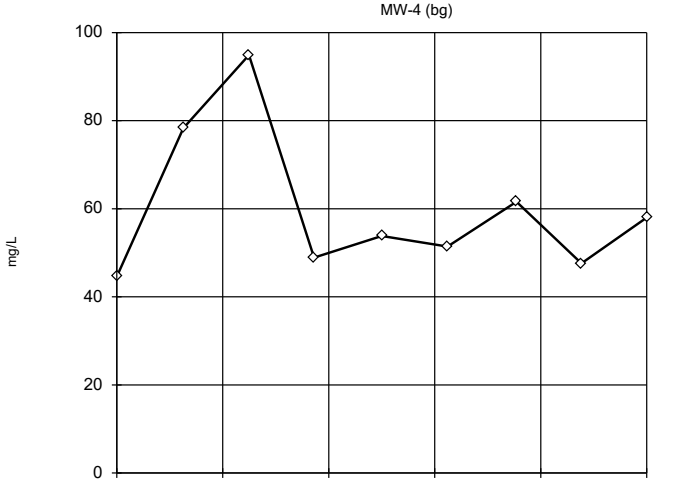
No statistical outliers.
Testing for 1 low outlier.
Mean = 0.2533.
Std. Dev. = 0.07736.
0.113: c = 0.3897
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9298
Critical = 0.818
The distribution was found to be normally distributed.

Constituent: Manganese Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)



n = 9

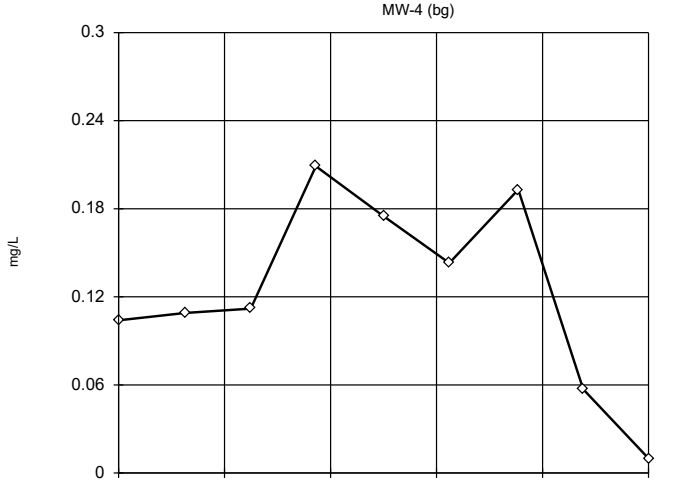
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 59.9, std. dev. 16.53, critical Tn 2.11

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.8345
Critical = 0.829
The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-4 (bg)



n = 9

No statistical outliers.
Testing for 1 low outlier.
Mean = 0.1236.
Std. Dev. = 0.06442.
<0.02: c = 0.2568
tabl = 0.512.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.05
Calculated = 0.9519
Critical = 0.818
The distribution was found to be normally distributed.

Constituent: Zinc Analysis Run 10/24/2024 12:29 PM View: 2024AWQR - MW-4 Outliers
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Attachment C

Prediction Limits

Prediction Limit

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP Printed 10/24/2024, 2:27 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	MW-6	0.006579	n/a	9/12/2024	0.00242	No	9	0	No	0.01	Param Inter
Arsenic (mg/L)	MW-7	0.006579	n/a	9/12/2024	0.00246	No	9	0	No	0.01	Param Inter
Barium (mg/L)	MW-1	0.2286	n/a	9/12/2024	0.0511	No	9	0	No	0.01	Param Inter
Barium (mg/L)	MW-5	0.2286	n/a	9/12/2024	0.0356	No	9	0	No	0.01	Param Inter
Barium (mg/L)	MW-6	0.2286	n/a	9/12/2024	0.116	No	9	0	No	0.01	Param Inter
Barium (mg/L)	MW-7	0.2286	n/a	9/12/2024	0.083	No	9	0	No	0.01	Param Inter
Cadmium (mg/L)	**MW-5**	**0.00025**	**n/a**	**9/12/2024**	**0.00088**	**Yes**	**9**	**77.78**	**n/a**	**0.08783**	**NP Inter (NDs)**
Cadmium (mg/L)	MW-6	0.00025	n/a	9/12/2024	0.000215	No	9	77.78	n/a	0.08783	NP Inter (NDs)
Chloride (mg/L)	MW-1	75.21	n/a	9/12/2024	5.03	No	9	0	x^(1/3)	0.01	Param Inter
Chloride (mg/L)	MW-5	75.21	n/a	9/12/2024	25.35	No	9	0	x^(1/3)	0.01	Param Inter
Chloride (mg/L)	MW-6	75.21	n/a	9/12/2024	20	No	9	0	x^(1/3)	0.01	Param Inter
Chloride (mg/L)	MW-7	75.21	n/a	9/12/2024	22.3	No	9	0	x^(1/3)	0.01	Param Inter
Cobalt (mg/L)	**MW-7**	**0.001655**	**n/a**	**9/12/2024**	**0.00172**	**Yes**	**9**	**44.44**	**sqrt(x)**	**0.01**	**Param Inter**
Iron (mg/L)	MW-5	5.254	n/a	9/12/2024	0.1585	No	9	0	No	0.01	Param Inter
Iron (mg/L)	MW-6	5.254	n/a	9/12/2024	0.214	No	9	0	No	0.01	Param Inter
Iron (mg/L)	MW-7	5.254	n/a	9/12/2024	0.401	No	9	0	No	0.01	Param Inter
Magnesium (mg/L)	MW-1	48.66	n/a	9/12/2024	16.5	No	9	0	No	0.01	Param Inter
Magnesium (mg/L)	MW-5	48.66	n/a	9/12/2024	34.05	No	9	0	No	0.01	Param Inter
Magnesium (mg/L)	MW-6	48.66	n/a	9/12/2024	26.5	No	9	0	No	0.01	Param Inter
Magnesium (mg/L)	MW-7	48.66	n/a	9/12/2024	28.7	No	9	0	No	0.01	Param Inter
Manganese (mg/L)	MW-1	0.4895	n/a	9/12/2024	0.0273	No	9	0	No	0.01	Param Inter
Manganese (mg/L)	**MW-5**	**0.4895**	**n/a**	**9/12/2024**	**0.6015**	**Yes**	**9**	**0**	**No**	**0.01**	**Param Inter**
Manganese (mg/L)	MW-6	0.4895	n/a	9/12/2024	0.483	No	9	0	No	0.01	Param Inter
Manganese (mg/L)	**MW-7**	**0.4895**	**n/a**	**9/12/2024**	**1.07**	**Yes**	**9**	**0**	**No**	**0.01**	**Param Inter**
Sulfate (mg/L)	MW-1	110.4	n/a	9/12/2024	13.6	No	9	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-5	110.4	n/a	9/12/2024	95.9	No	9	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-6	110.4	n/a	9/12/2024	93.1	No	9	0	No	0.01	Param Inter
Sulfate (mg/L)	**MW-7**	**110.4**	**n/a**	**9/12/2024**	**175**	**Yes**	**9**	**0**	**No**	**0.01**	**Param Inter**
Zinc (mg/L)	MW-6	0.3202	n/a	9/12/2024	0.025	No	9	11.11	No	0.01	Param Inter

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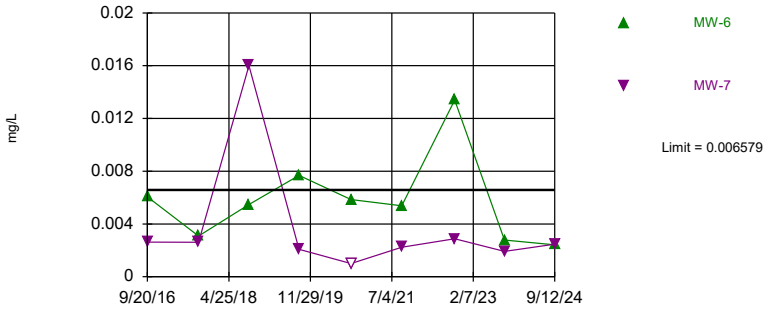
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.004128, Std. Dev.=0.0008028, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9611, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Based on user-set k of 4 (assumes 2 future values).

Constituent: Arsenic Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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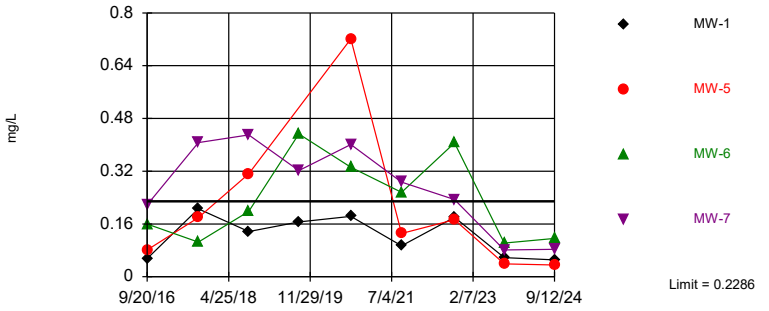
Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.1248, Std. Dev.=0.034, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9305, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit.

Constituent: Barium Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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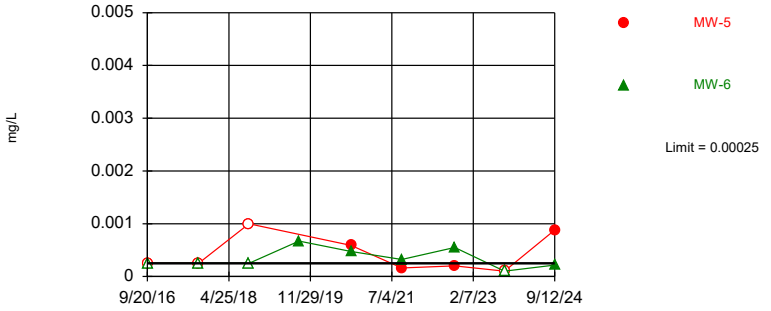
Hollow symbols indicate censored values.

Exceeds Limit: MW-5

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 9 background values. 77.78% NDs. Report alpha = 0.3077. Individual comparison alpha = 0.08783. Based on user-set k of 4 (assumes 2 future values).

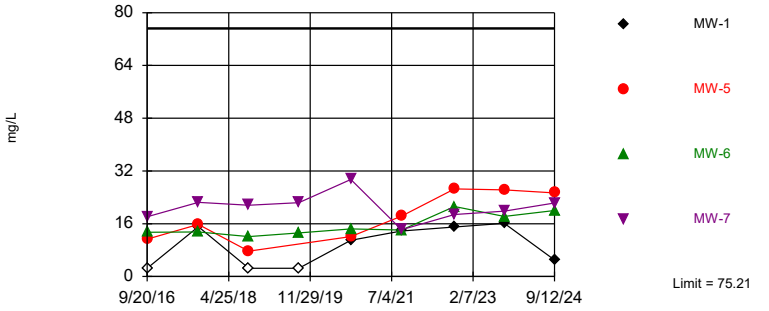
Constituent: Cadmium Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



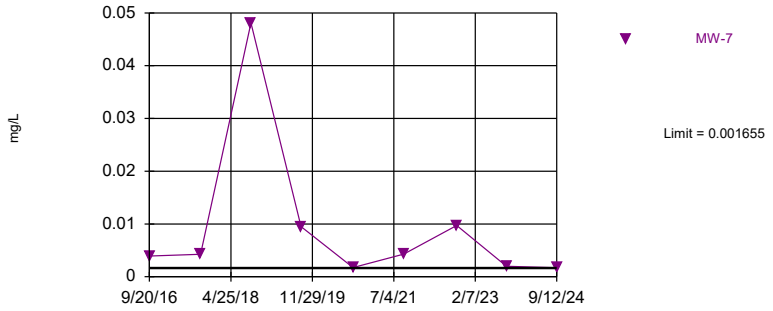
Background Data Summary (based on cube root transformation): Mean=2.818, Std. Dev.=0.4595, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7788, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit.

Constituent: Chloride Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Exceeds Limit: MW-7

Prediction Limit

Interwell Parametric



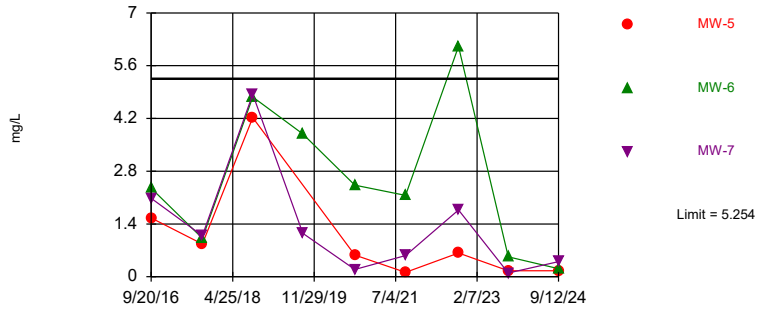
Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.02146, Std. Dev.=0.006295, n=9, 44.44% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7698, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Based on user-set k of 4 (assumes 3 future values).

Constituent: Cobalt Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Within Limit

Prediction Limit

Interwell Parametric



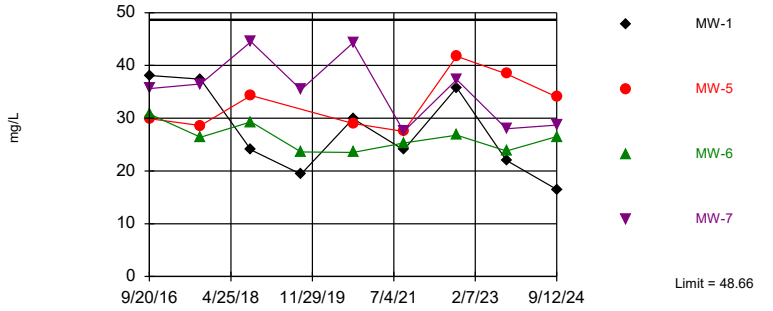
Background Data Summary: Mean=1.905, Std. Dev.=1.097, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9618, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Based on user-set k of 4 (assumes 1 future value).

Constituent: Iron Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Within Limit

Prediction Limit

Interwell Parametric



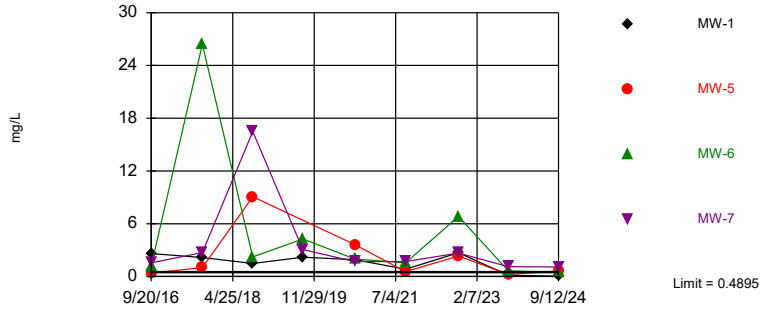
Background Data Summary: Mean=28.2, Std. Dev.=6.7, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9471, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit.

Constituent: Magnesium Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Exceeds Limit: MW-5, MW-7

Prediction Limit

Interwell Parametric



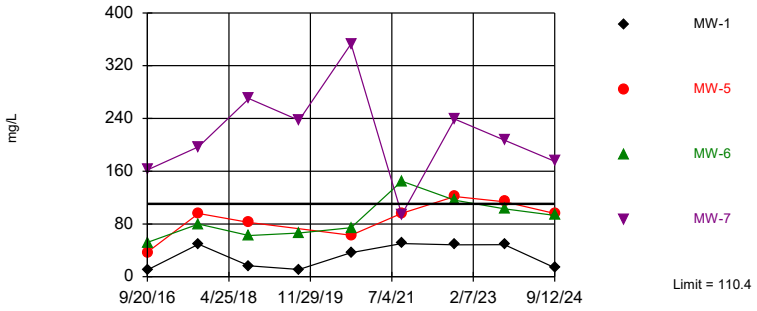
Background Data Summary: Mean=0.2533, Std. Dev.=0.07736, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9746, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit.

Constituent: Manganese Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Exceeds Limit: MW-7

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=59.9, Std. Dev.=16.53, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8345, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit.

Constituent: Sulfate Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

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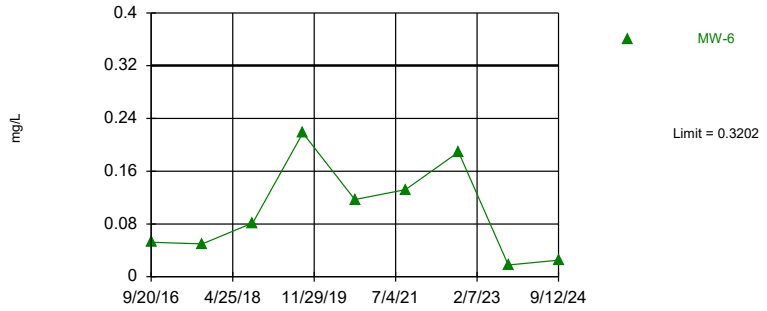
Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.1236, Std. Dev.=0.06442, n=9, 11.11% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9601, critical = 0.764. Report alpha = 0.0394. Individual comparison alpha = 0.01. Based on user-set k of 4 (assumes 3 future values).

Constituent: Zinc Analysis Run 10/24/2024 2:26 PM View: 2024AWQR - Prediction Limits

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO HMSP

Attachment D

Trend Test (α=0.01)

Trend Test

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM Printed 11/5/2024, 9:18 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Arsenic (mg/L)	MW-1	-0.0005842	-15	-21	No	8	25	0.01	NP
Arsenic (mg/L)	MW-4 (bg)	0.0001013	6	21	No	8	0	0.01	NP
Arsenic (mg/L)	MW-5	-0.000005215	-16	-21	No	8	50	0.01	NP
Arsenic (mg/L)	MW-6	-0.000231	-6	-21	No	8	0	0.01	NP
Arsenic (mg/L)	MW-7	-0.00006634	-4	-21	No	8	12.5	0.01	NP
Barium (mg/L)	MW-1	-0.01682	-16	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-4 (bg)	-0.003088	-4	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-5	-0.0163	-10	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-6	-0.004677	-2	-21	No	8	0	0.01	NP
Barium (mg/L)	**MW-7**	**-0.04984**	**-22**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Cadmium (mg/L)	MW-1	-0.00007945	-10	-21	No	8	12.5	0.01	NP
Cadmium (mg/L)	MW-4 (bg)	-0.00002221	-11	-21	No	8	75	0.01	NP
Cadmium (mg/L)	MW-5	-0.00001401	-5	-21	No	8	50	0.01	NP
Cadmium (mg/L)	MW-6	-0.00001543	-5	-21	No	8	37.5	0.01	NP
Cadmium (mg/L)	**MW-7**	**-0.0001389**	**-24**	**-21**	**Yes**	**8**	**25**	**0.01**	**NP**
Chloride (mg/L)	MW-1	0.8148	7	21	No	8	25	0.01	NP
Chloride (mg/L)	MW-4 (bg)	0.2891	0	21	No	8	0	0.01	NP
Chloride (mg/L)	MW-5	2.181	16	21	No	8	0	0.01	NP
Chloride (mg/L)	MW-6	1.198	18	21	No	8	0	0.01	NP
Chloride (mg/L)	MW-7	-0.2051	-6	-21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-1	-0.001244	-18	-21	No	8	12.5	0.01	NP
Cobalt (mg/L)	MW-4 (bg)	-0.000006739	-8	-21	No	8	50	0.01	NP
Cobalt (mg/L)	MW-5	-0.000001786	-3	-21	No	8	37.5	0.01	NP
Cobalt (mg/L)	MW-6	-0.0003662	-8	-21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-7	-0.0008449	-10	-21	No	8	0	0.01	NP
Copper (mg/L)	MW-1	-0.00188	-12	-21	No	8	12.5	0.01	NP
Copper (mg/L)	MW-5	-0.00004699	-8	-21	No	8	62.5	0.01	NP
Copper (mg/L)	**MW-7**	**-0.00137**	**-24**	**-21**	**Yes**	**8**	**12.5**	**0.01**	**NP**
Iron (mg/L)	MW-1	-2.204	-18	-21	No	8	0	0.01	NP
Iron (mg/L)	MW-4 (bg)	0.09297	4	21	No	8	0	0.01	NP
Iron (mg/L)	MW-5	-0.1649	-15	-21	No	8	0	0.01	NP
Iron (mg/L)	MW-6	-0.5939	-10	-21	No	8	0	0.01	NP
Iron (mg/L)	MW-7	-0.1575	-10	-21	No	8	0	0.01	NP
Lead (mg/L)	MW-1	-0.001168	-19	-21	No	8	25	0.01	NP
Lead (mg/L)	MW-4 (bg)	-0.0002434	-16	-21	No	8	12.5	0.01	NP
Lead (mg/L)	MW-5	0	-8	-21	No	8	75	0.01	NP
Lead (mg/L)	MW-6	-0.00001423	-6	-21	No	8	50	0.01	NP
Magnesium (mg/L)	MW-1	-1.876	-11	-21	No	8	0	0.01	NP
Magnesium (mg/L)	MW-4 (bg)	-0.3597	-2	-21	No	8	0	0.01	NP
Magnesium (mg/L)	MW-5	0.7997	6	21	No	8	0	0.01	NP
Magnesium (mg/L)	MW-6	-0.0419	0	21	No	8	0	0.01	NP
Magnesium (mg/L)	MW-7	-1.602	-10	-21	No	8	0	0.01	NP
Manganese (mg/L)	MW-1	-0.2698	-12	-21	No	8	0	0.01	NP
Manganese (mg/L)	MW-4 (bg)	0.008955	8	21	No	8	0	0.01	NP
Manganese (mg/L)	MW-5	-0.08594	-4	-21	No	8	0	0.01	NP
Manganese (mg/L)	MW-6	-0.4471	-18	-21	No	8	0	0.01	NP
Manganese (mg/L)	MW-7	-0.2747	-20	-21	No	8	0	0.01	NP
Selenium (mg/L)	MW-7	0	6	21	No	8	62.5	0.01	NP
Sulfate (mg/L)	MW-1	0.04388	0	21	No	8	0	0.01	NP
Sulfate (mg/L)	MW-4 (bg)	-2.24	-8	-21	No	8	0	0.01	NP

Trend Test

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM Printed 11/5/2024, 9:18 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Sulfate (mg/L)	MW-5	6.349	13	21	No	8	0	0.01	NP
Sulfate (mg/L)	MW-6	5.236	10	21	No	8	0	0.01	NP
Sulfate (mg/L)	MW-7	-10.03	-6	-21	No	8	0	0.01	NP
Zinc (mg/L)	MW-1	-0.007541	-12	-21	No	8	12.5	0.01	NP
Zinc (mg/L)	MW-4 (bg)	-0.01258	-6	-21	No	8	12.5	0.01	NP
Zinc (mg/L)	MW-5	-0.004692	-7	-21	No	8	25	0.01	NP
Zinc (mg/L)	MW-6	-0.004437	-2	-21	No	8	0	0.01	NP
Zinc (mg/L)	MW-7	0	-8	-21	No	8	75	0.01	NP

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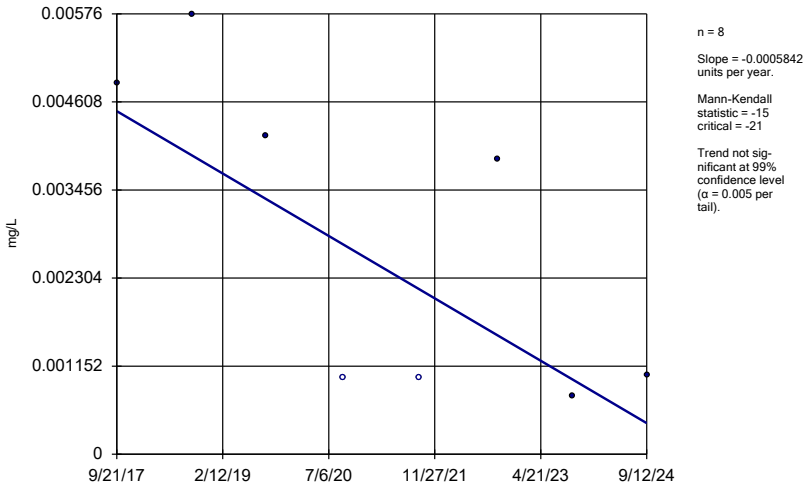
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.0005842 units per year.

Mann-Kendall statistic = -15
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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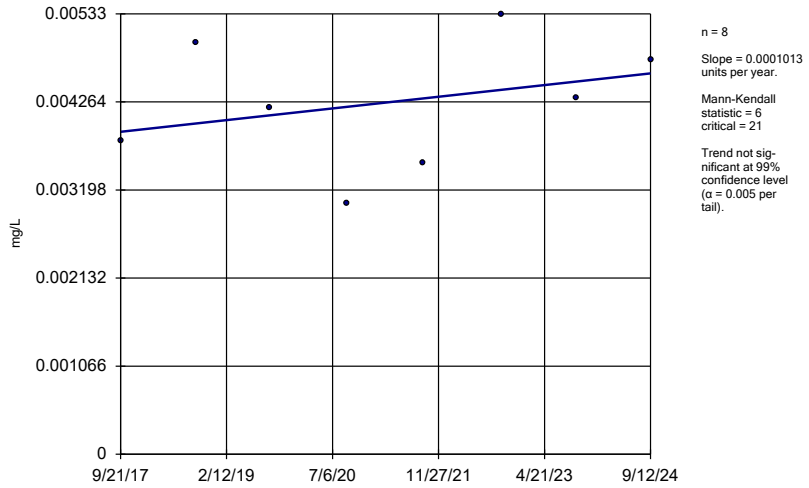
Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = 0.0001013 units per year.

Mann-Kendall statistic = 6
critical = 21

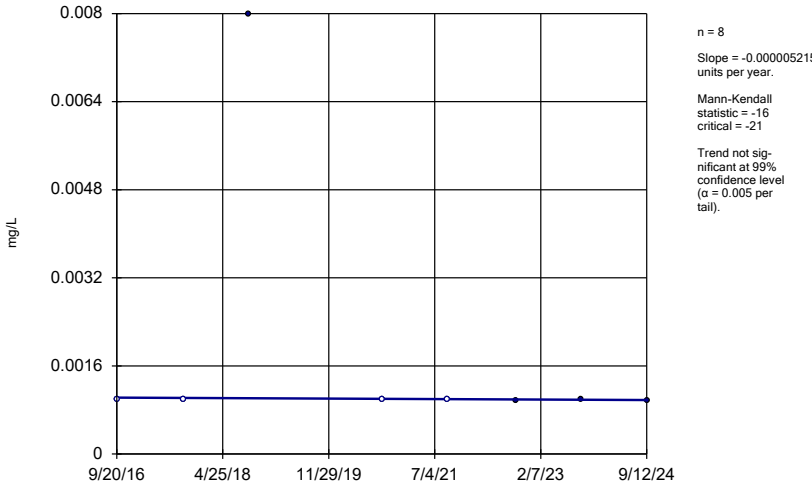
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.000005215 units per year.

Mann-Kendall statistic = -16
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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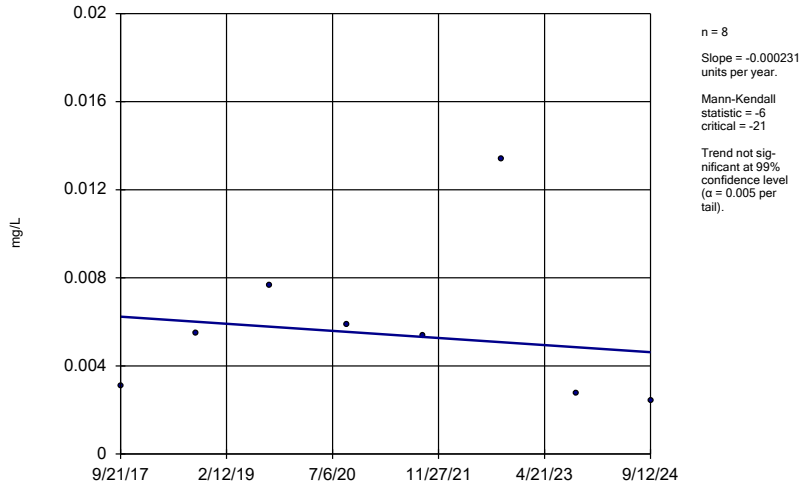
Sen's Slope Estimator

MW-6



n = 8

Slope = -0.000231 units per year.

Mann-Kendall statistic = -6
critical = -21

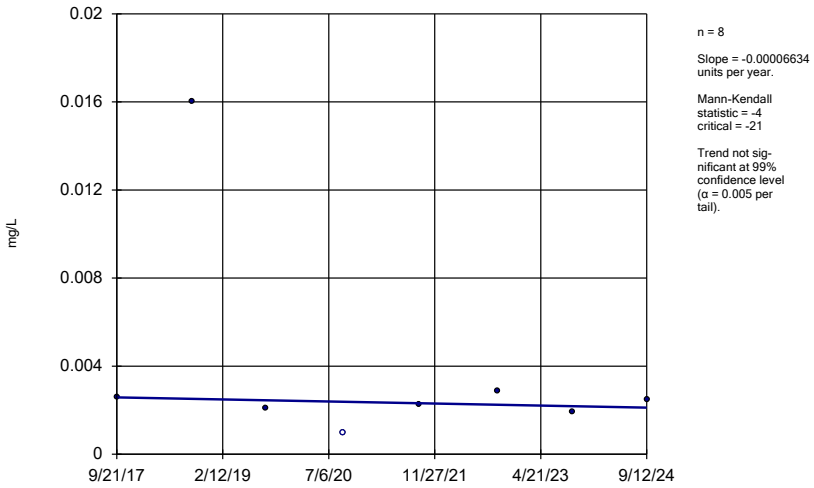
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.00006634 units per year.

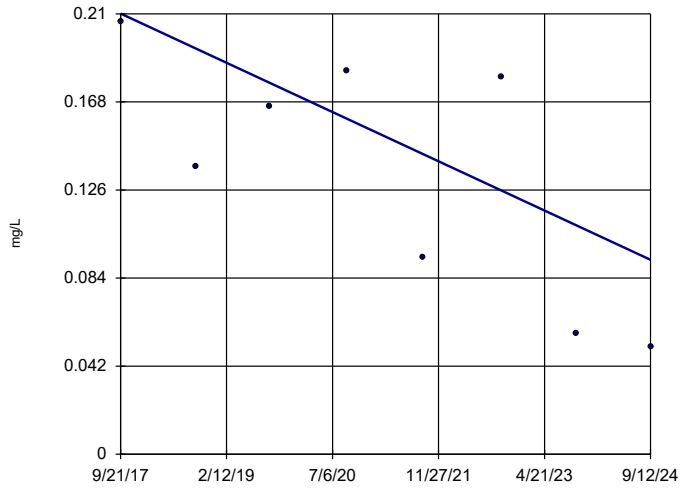
Mann-Kendall statistic = -4
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.01682 units per year.

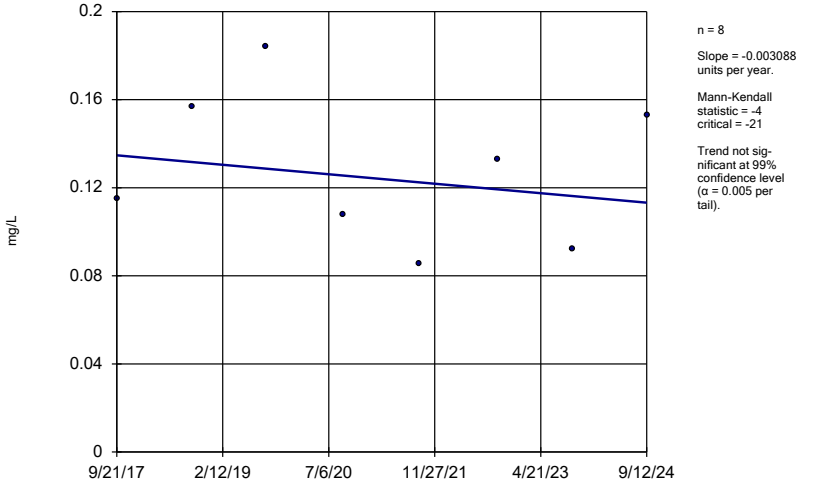
Mann-Kendall statistic = -16
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = -0.003088 units per year.

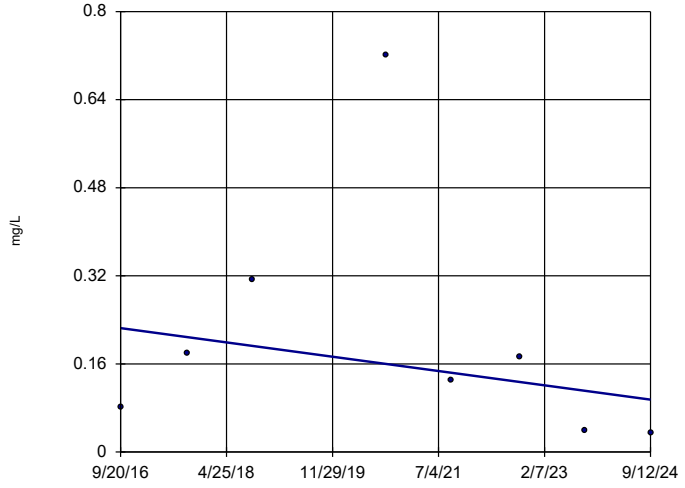
Mann-Kendall statistic = -4
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.0163 units per year.

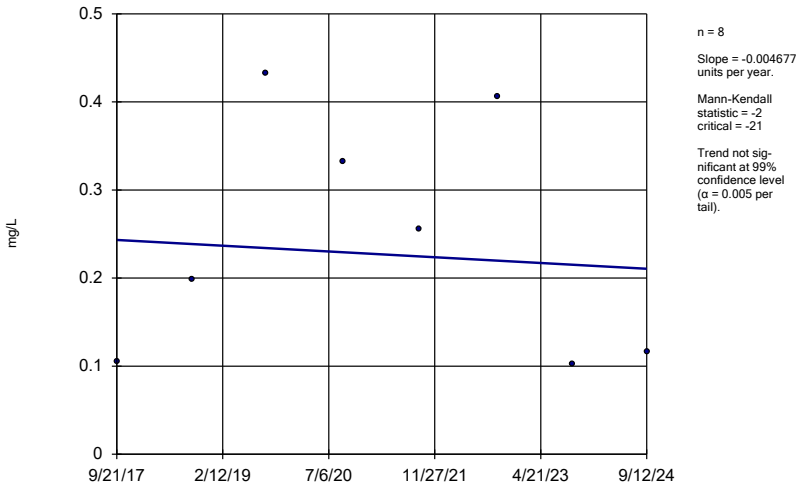
Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-6



n = 8

Slope = -0.004677 units per year.

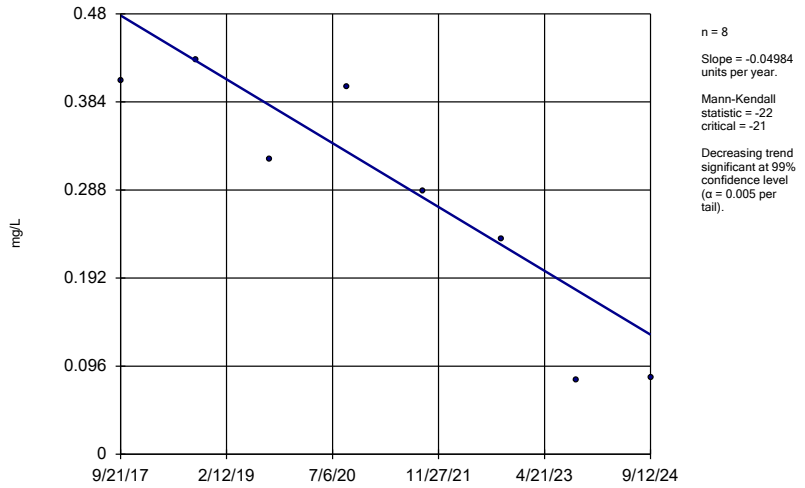
Mann-Kendall statistic = -2
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.04984 units per year.

Mann-Kendall statistic = -22
critical = -21

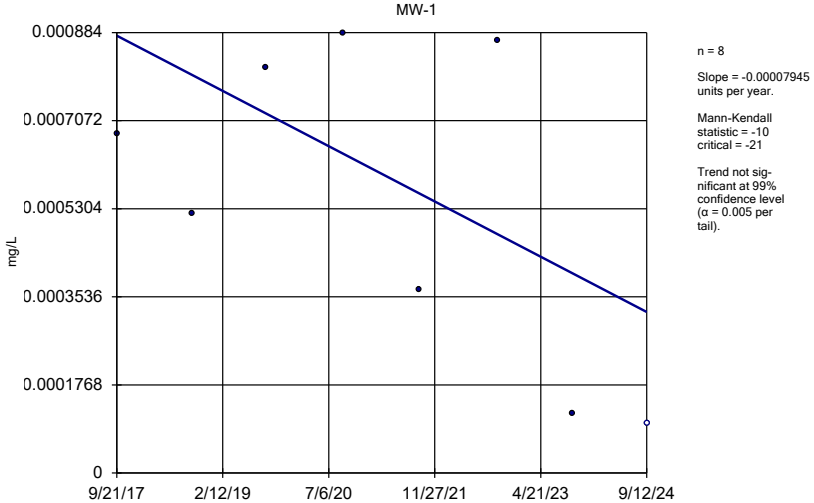
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 11/5/2024 9:14 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.00007945 units per year.

Mann-Kendall statistic = -10
critical = -21

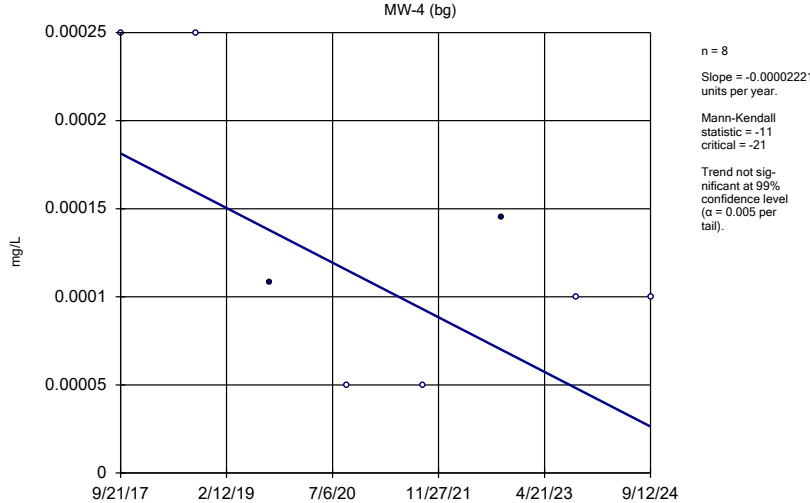
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = -0.00002221 units per year.

Mann-Kendall statistic = -11
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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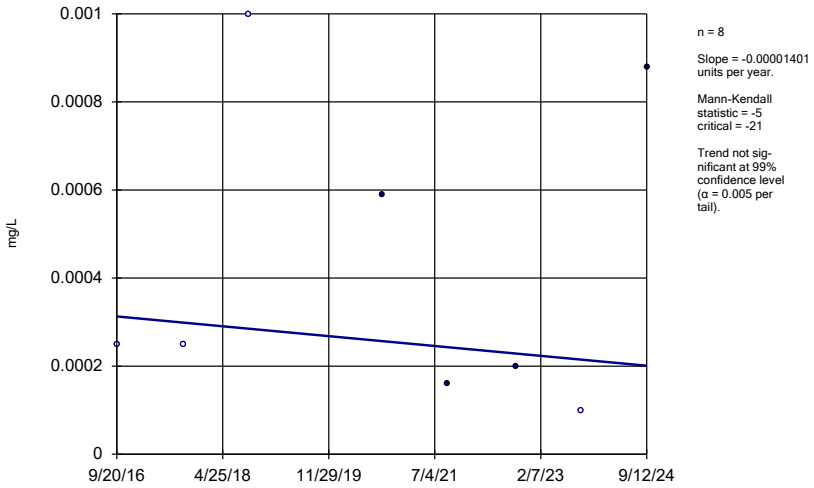
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.00001401 units per year.

Mann-Kendall statistic = -5
critical = -21

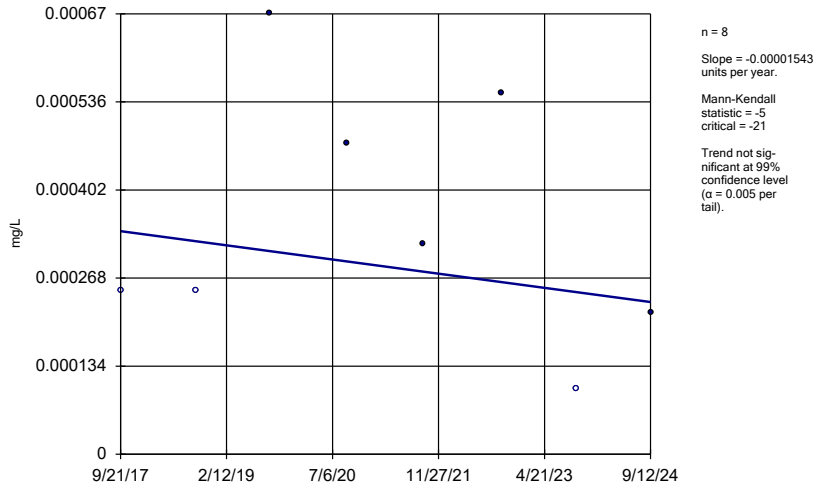
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-6



n = 8

Slope = -0.00001543 units per year.

Mann-Kendall statistic = -5
critical = -21

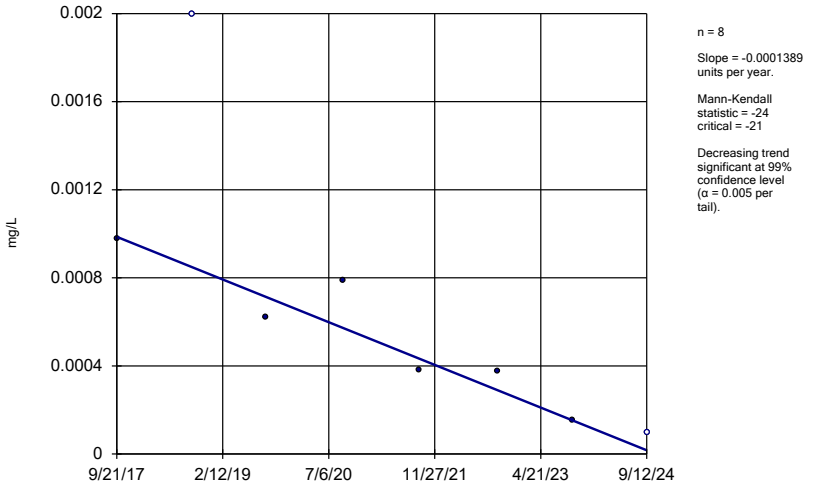
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.0001389 units per year.

Mann-Kendall statistic = -24
critical = -21

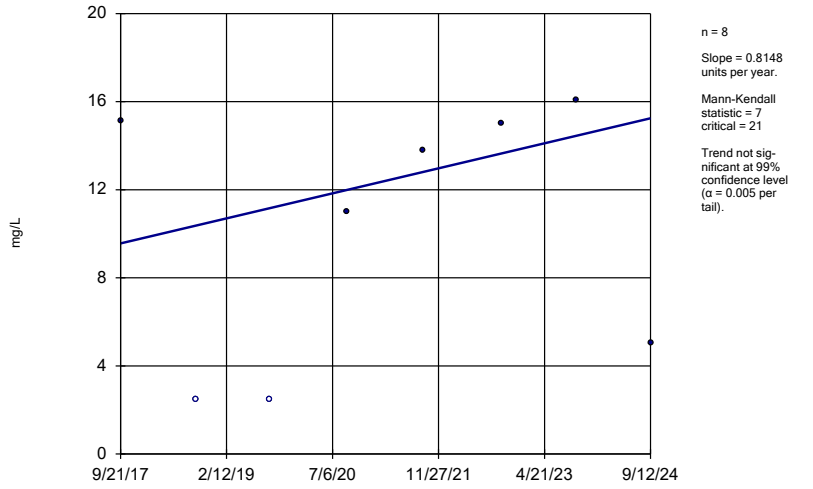
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = 0.8148 units per year.

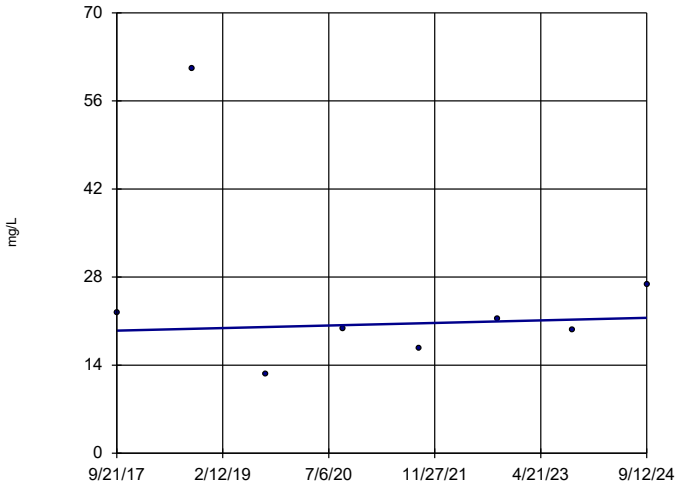
Mann-Kendall statistic = 7
critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = 0.2891 units per year.

Mann-Kendall statistic = 0 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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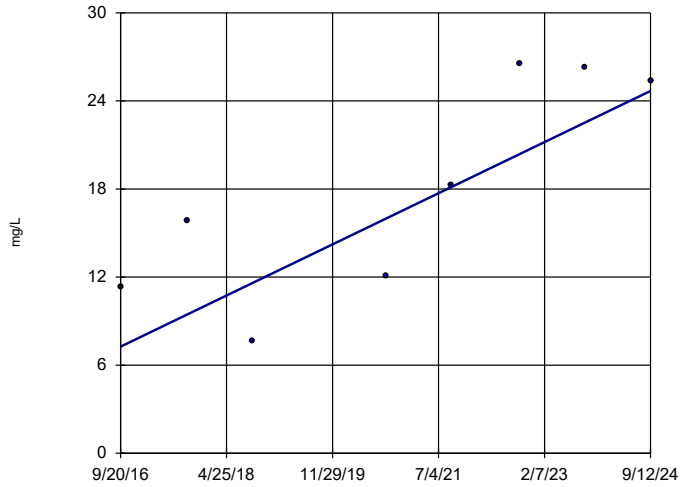
Sen's Slope Estimator

MW-5



n = 8

Slope = 2.181 units per year.

Mann-Kendall statistic = 16 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

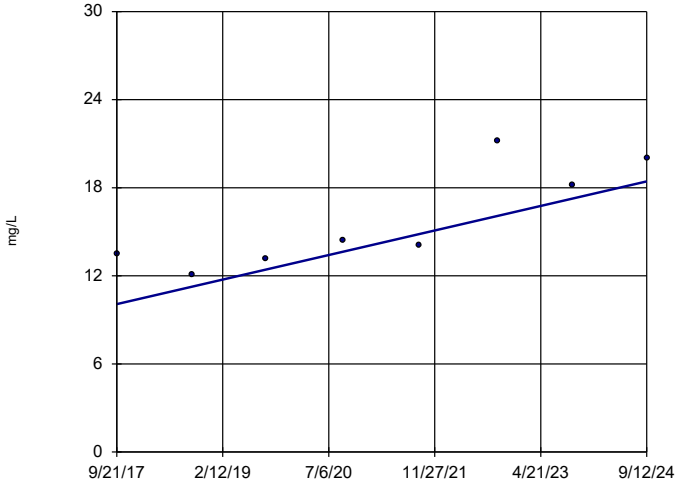
Constituent: Chloride Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

MW-6



n = 8

Slope = 1.198 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

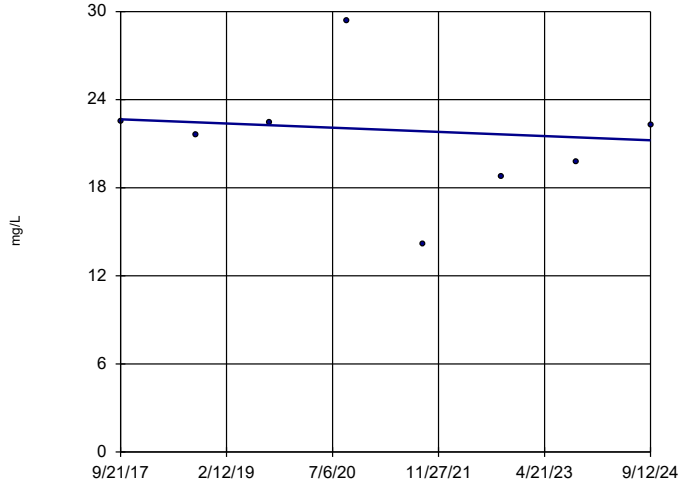
Constituent: Chloride Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.2051 units per year.

Mann-Kendall statistic = -6 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

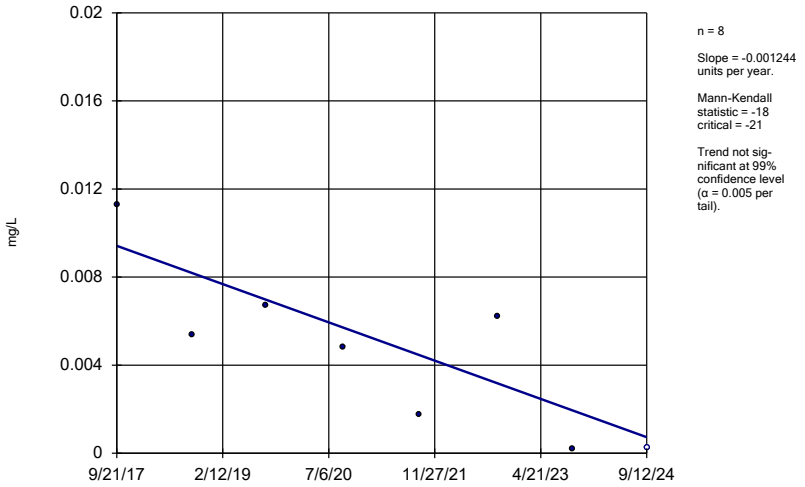
Constituent: Chloride Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.001244 units per year.

Mann-Kendall statistic = -18
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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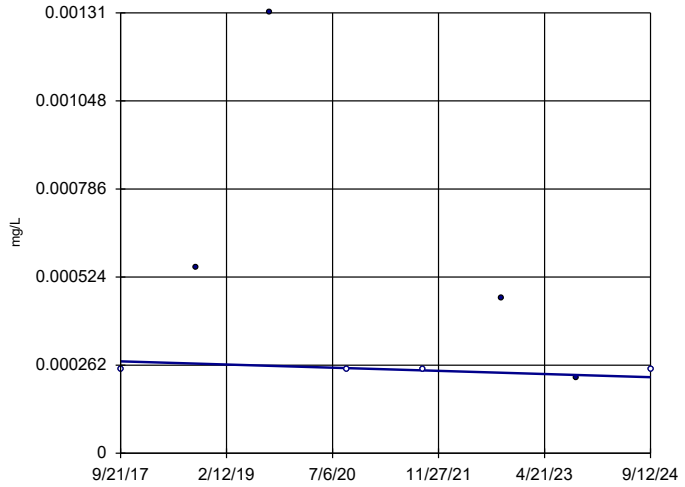
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = -0.000006739 units per year.

Mann-Kendall statistic = -8
critical = -21

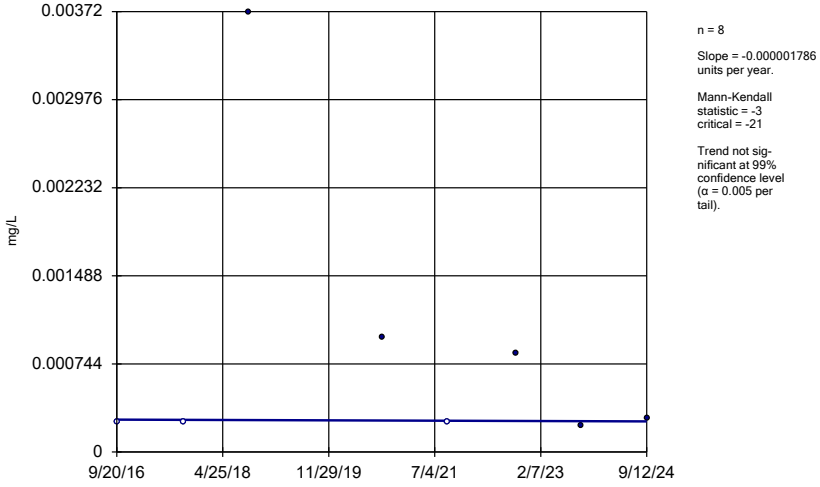
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.000001786 units per year.

Mann-Kendall statistic = -3
critical = -21

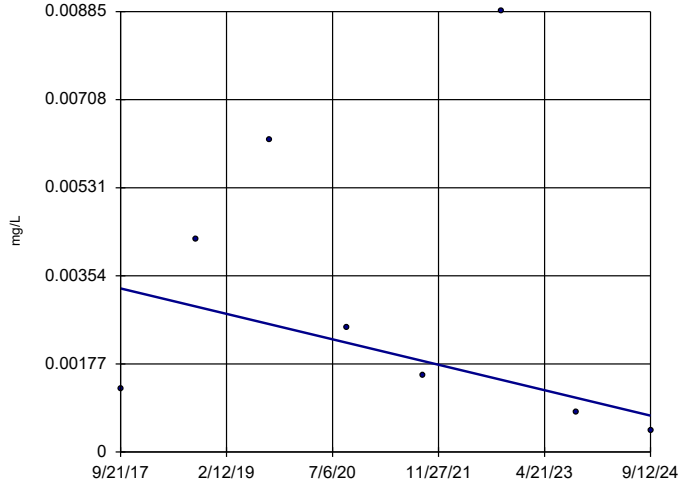
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

MW-6



n = 8

Slope = -0.0003662 units per year.

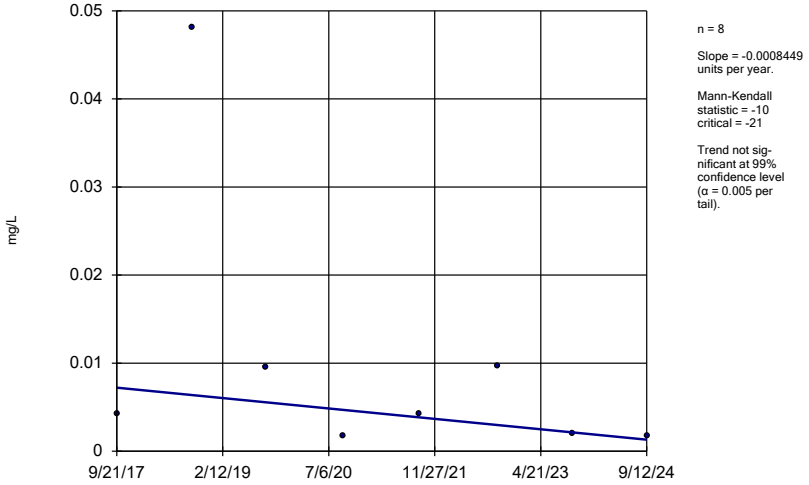
Mann-Kendall statistic = -8
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.0008449 units per year.

Mann-Kendall statistic = -10
critical = -21

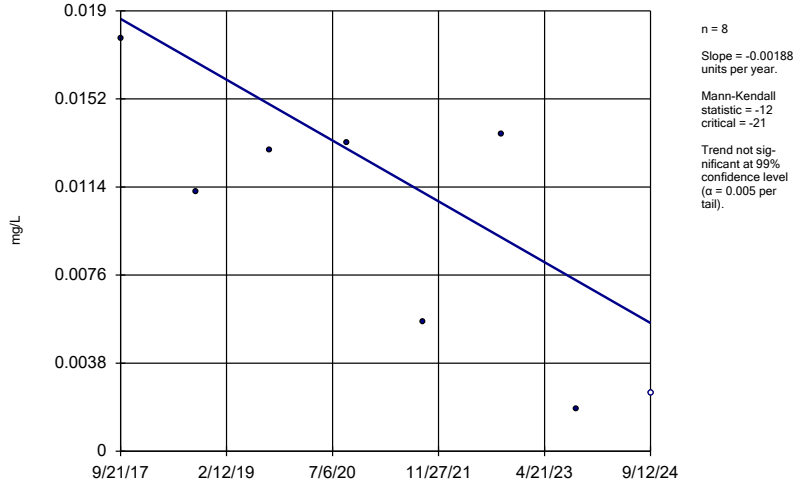
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.00188 units per year.

Mann-Kendall statistic = -12
critical = -21

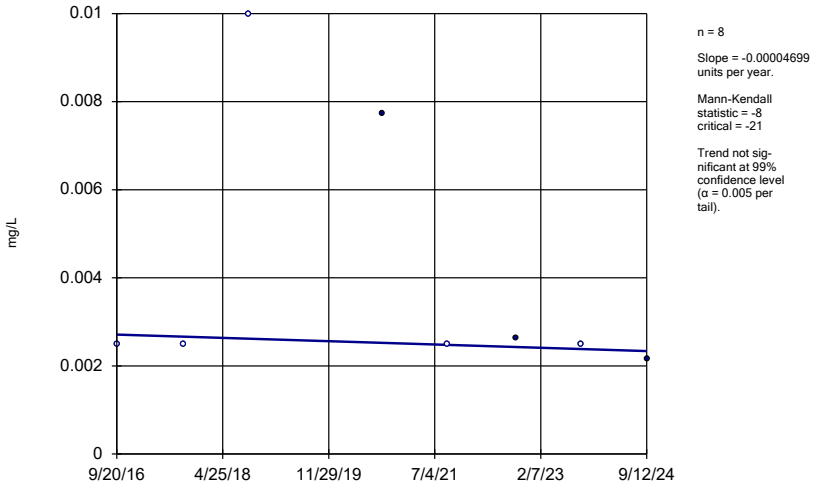
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Copper Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.00004699 units per year.

Mann-Kendall statistic = -8
critical = -21

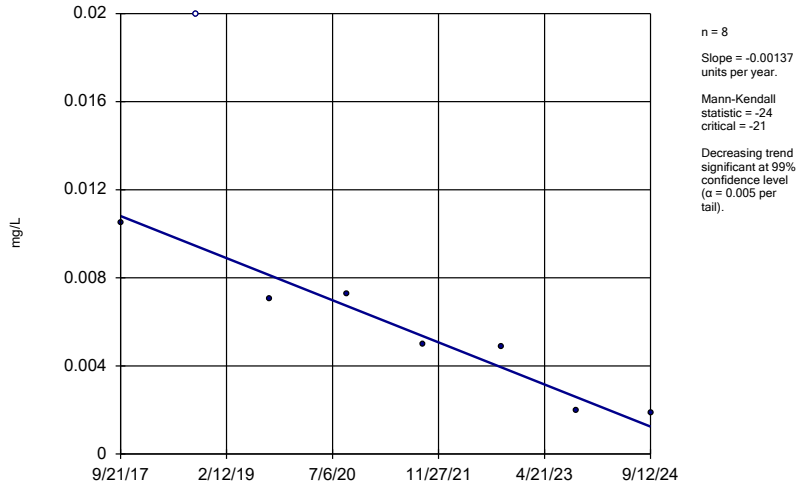
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Copper Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-7



n = 8

Slope = -0.00137 units per year.

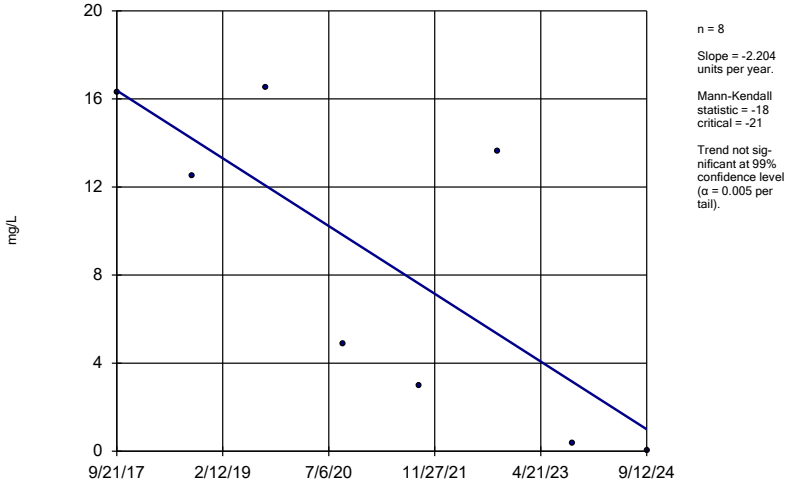
Mann-Kendall statistic = -24
critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Copper Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-1



n = 8

Slope = -2.204 units per year.

Mann-Kendall statistic = -18
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Iron Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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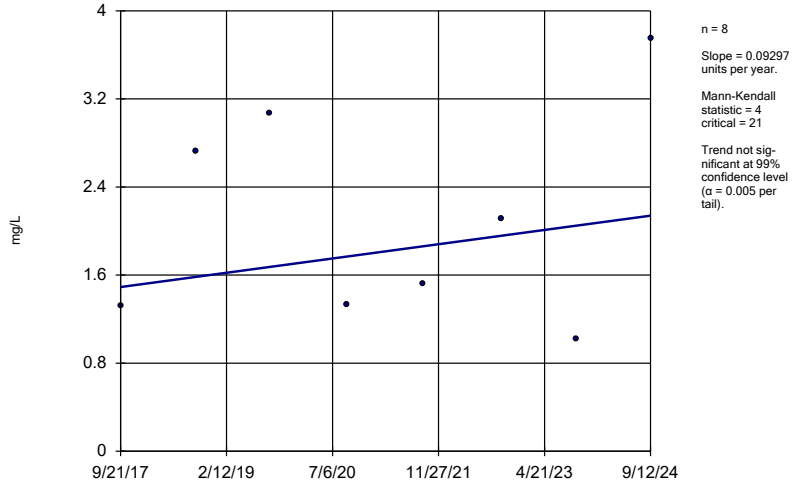
Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = 0.09297 units per year.

Mann-Kendall statistic = 4
critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Iron Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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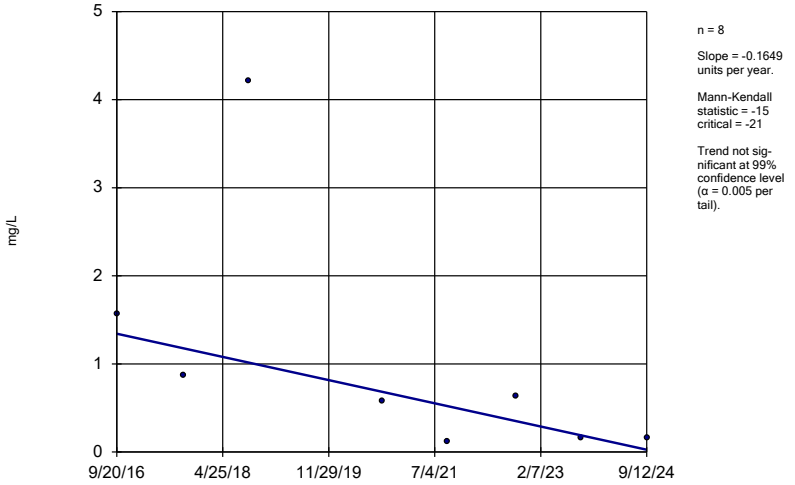
Sen's Slope Estimator

MW-5



n = 8

Slope = -0.1649 units per year.

Mann-Kendall statistic = -15
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Iron Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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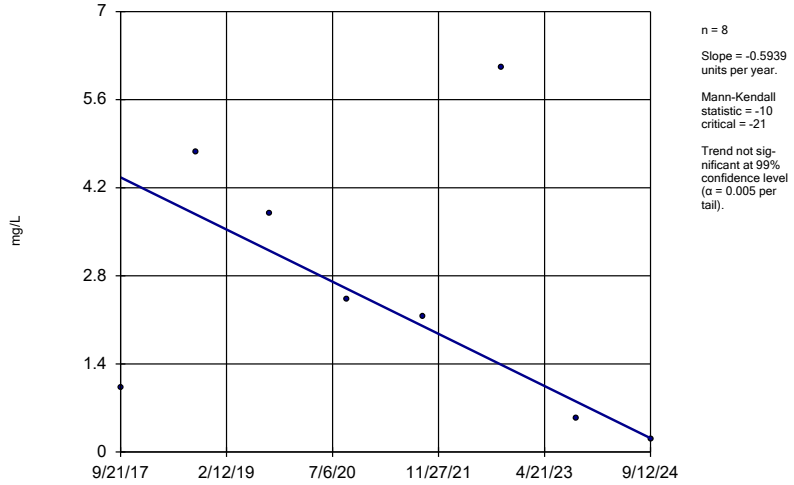
Sen's Slope Estimator

MW-6



n = 8

Slope = -0.5939 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Iron Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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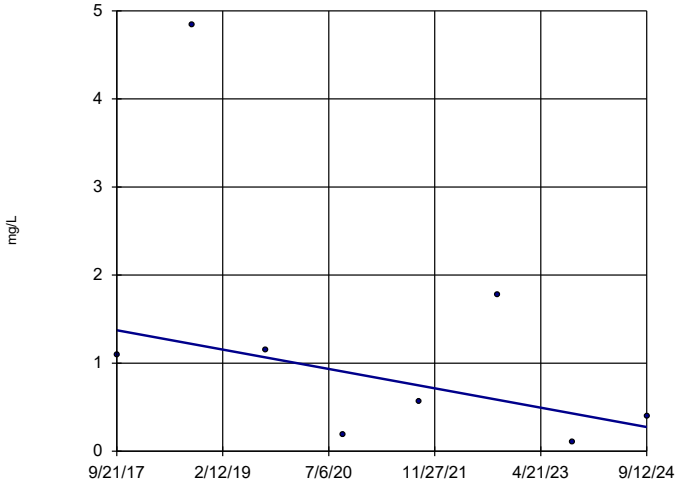
Sen's Slope Estimator

MW-7



n = 8

Slope = -0.1575 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Iron Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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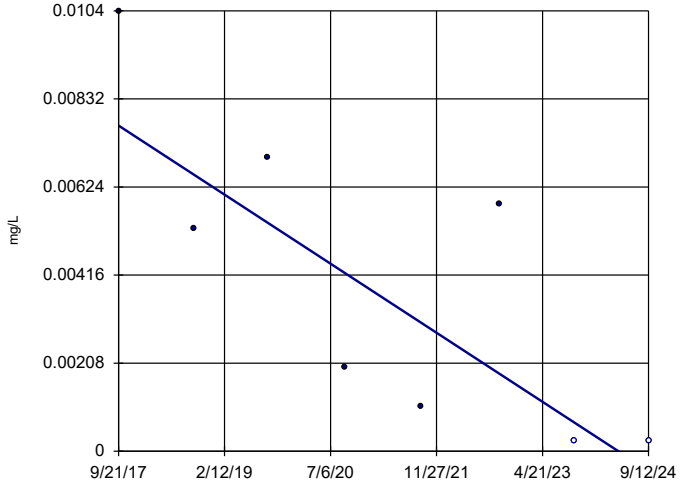
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.001168 units per year.

Mann-Kendall statistic = -19
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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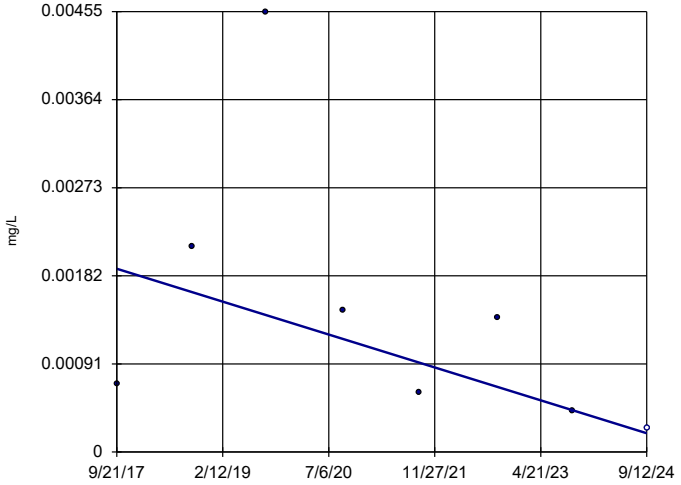
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = -0.0002434 units per year.

Mann-Kendall statistic = -16
critical = -21

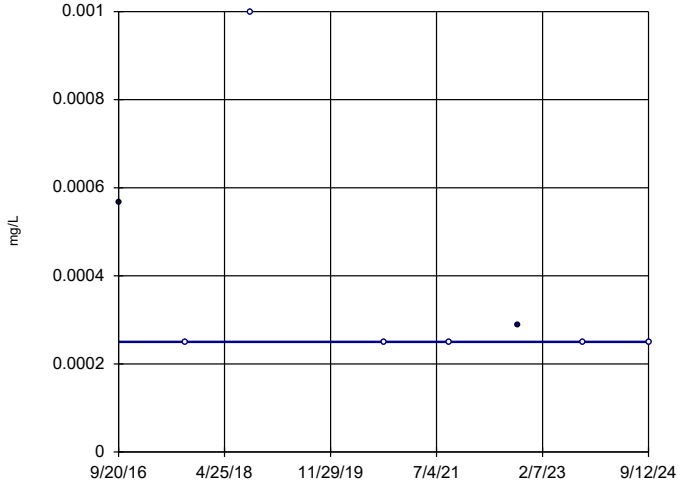
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -8
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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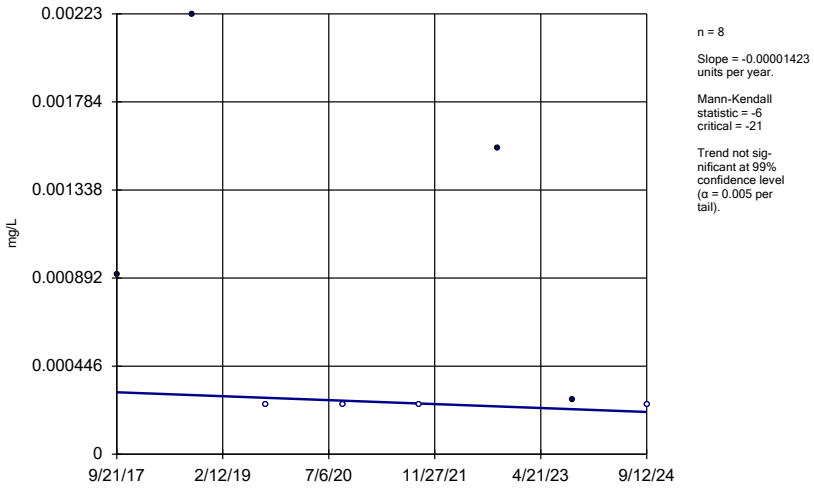
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-6

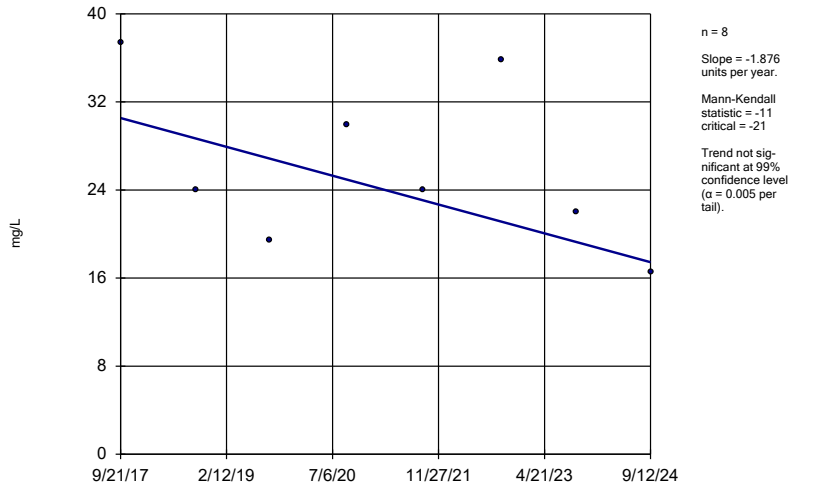


Constituent: Lead Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

MW-1

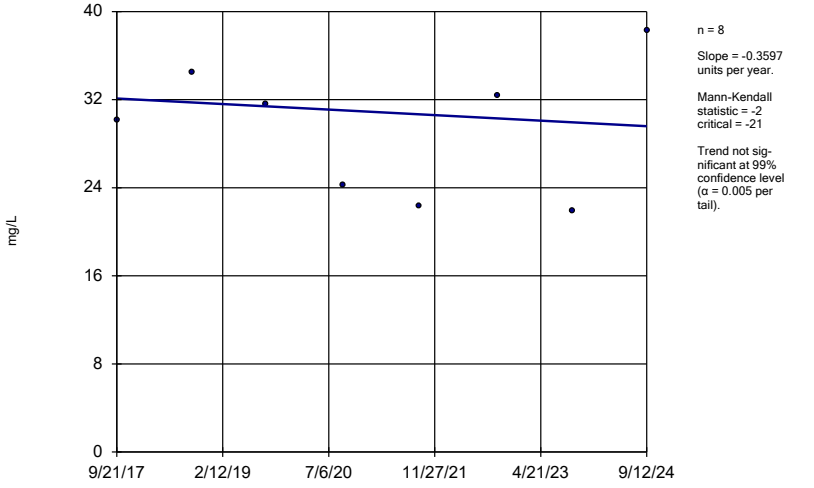


Constituent: Magnesium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

MW-4 (bg)

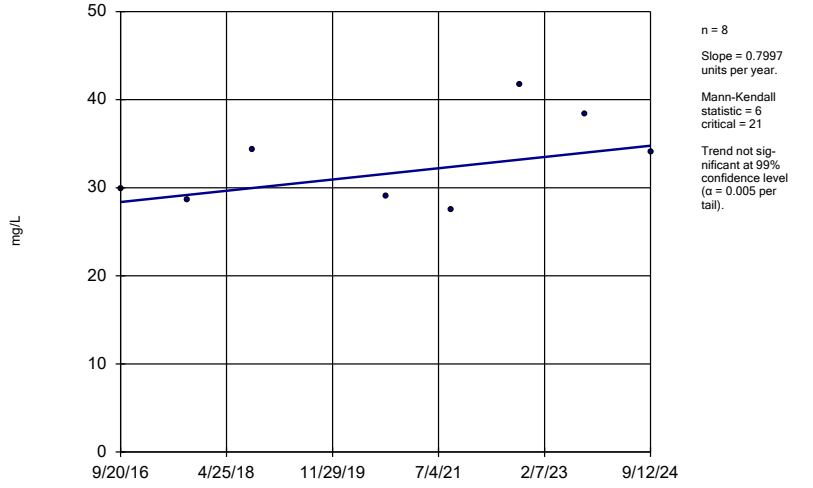


Constituent: Magnesium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA

Sen's Slope Estimator

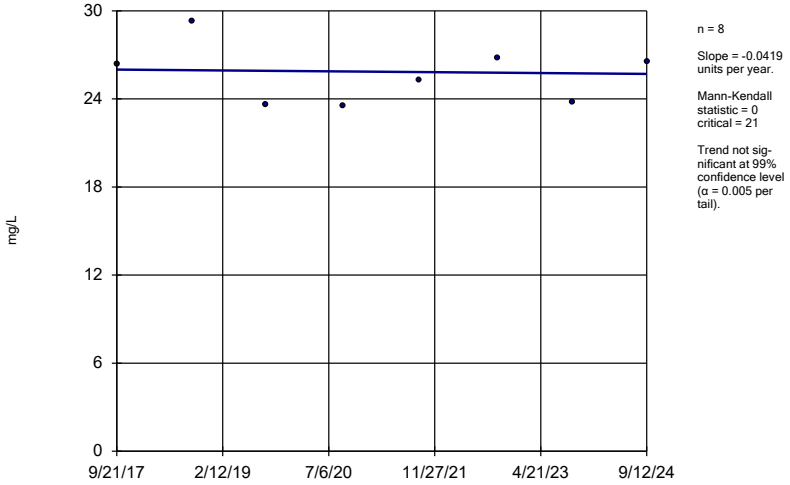
MW-5



Constituent: Magnesium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-6



n = 8

Slope = -0.0419 units per year.

Mann-Kendall statistic = 0
critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Magnesium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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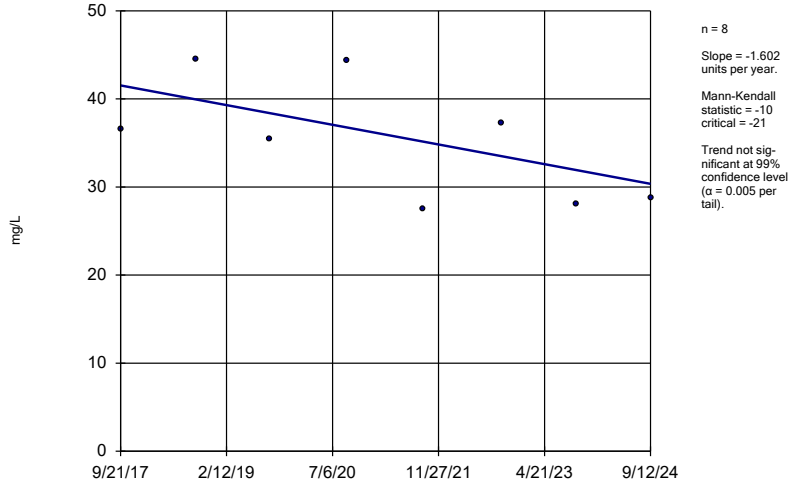
Sen's Slope Estimator

MW-7



n = 8

Slope = -1.602 units per year.

Mann-Kendall statistic = -10
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Magnesium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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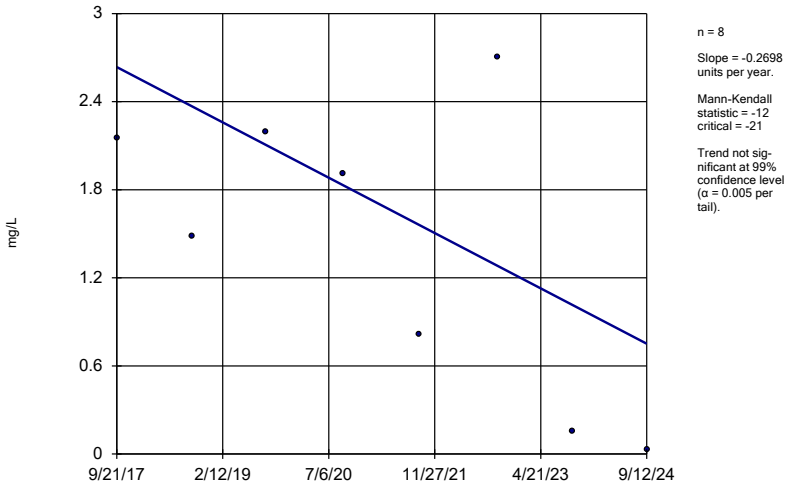
Sen's Slope Estimator

MW-1



n = 8

Slope = -0.2698 units per year.

Mann-Kendall statistic = -12
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Manganese Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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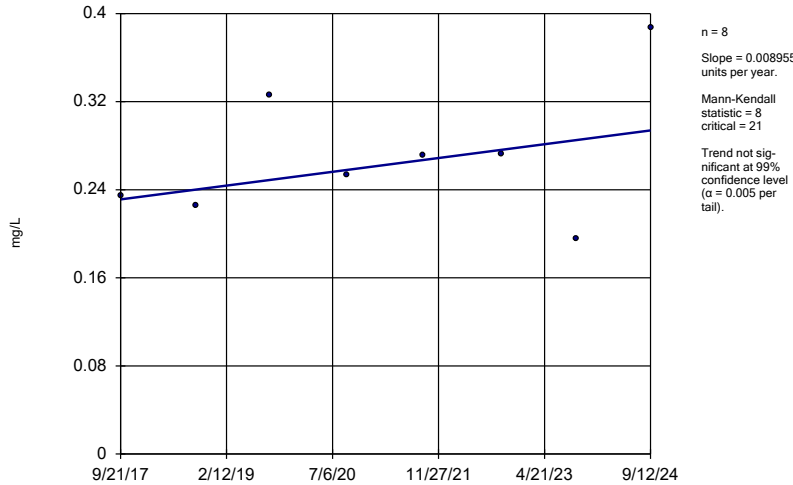
Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = 0.008955 units per year.

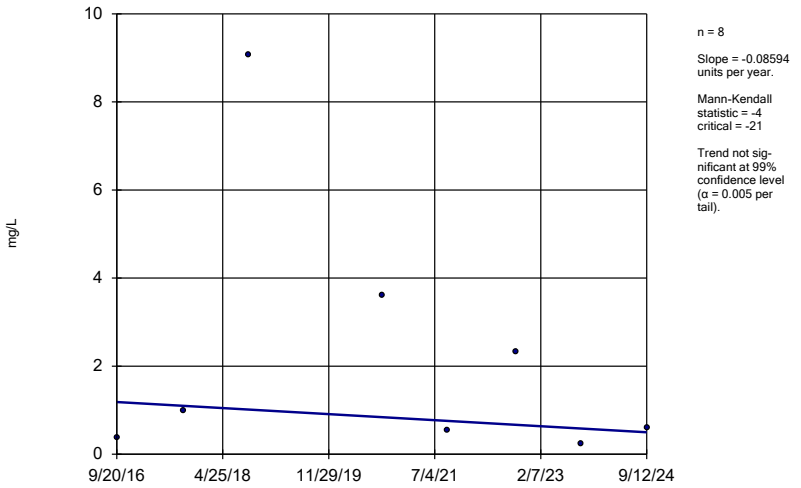
Mann-Kendall statistic = 8
critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Manganese Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

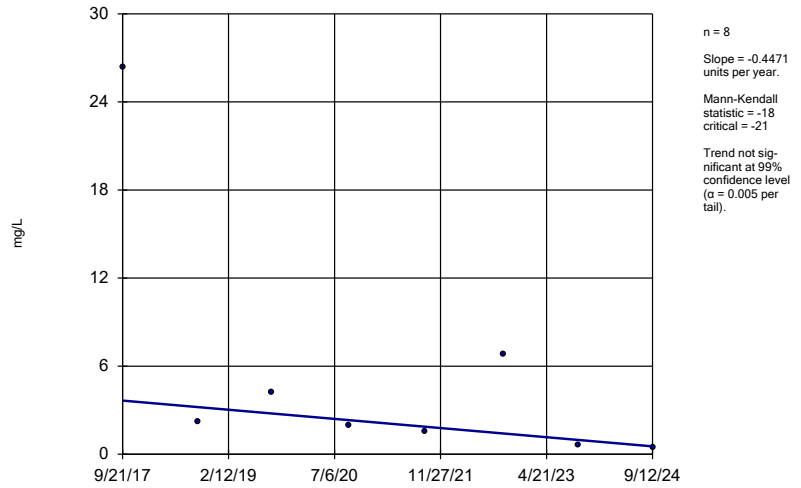
MW-5



Constituent: Manganese Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

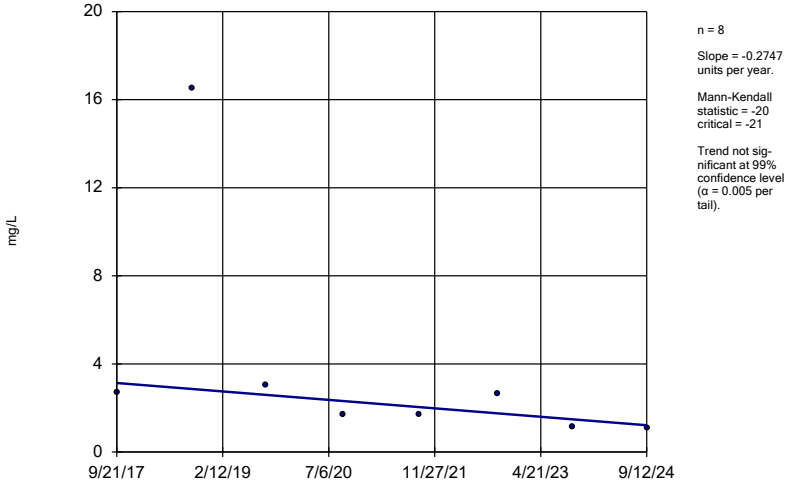
MW-6



Constituent: Manganese Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-7

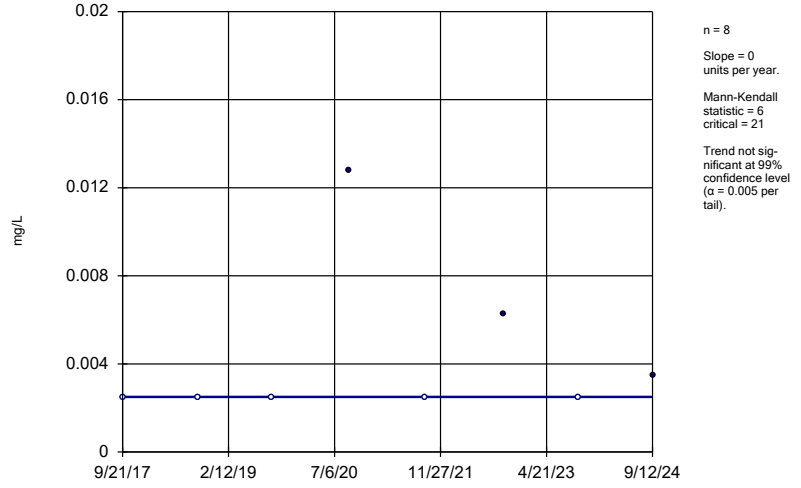


Constituent: Manganese Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

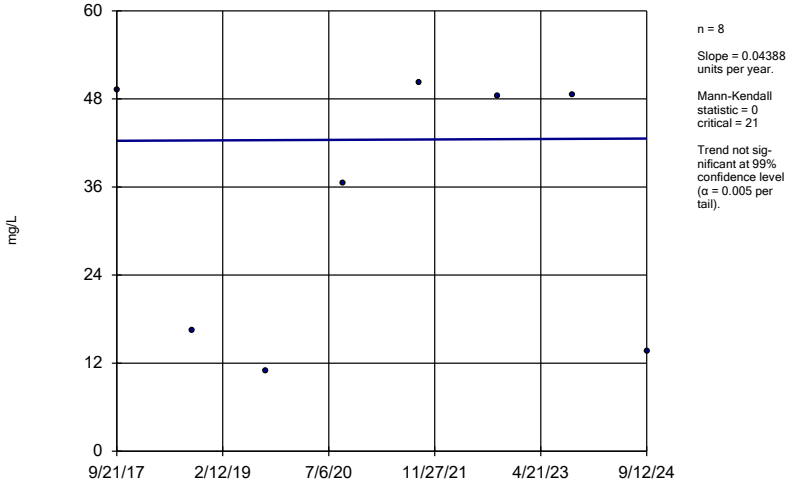
MW-7



Constituent: Selenium Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-1



Constituent: Sulfate Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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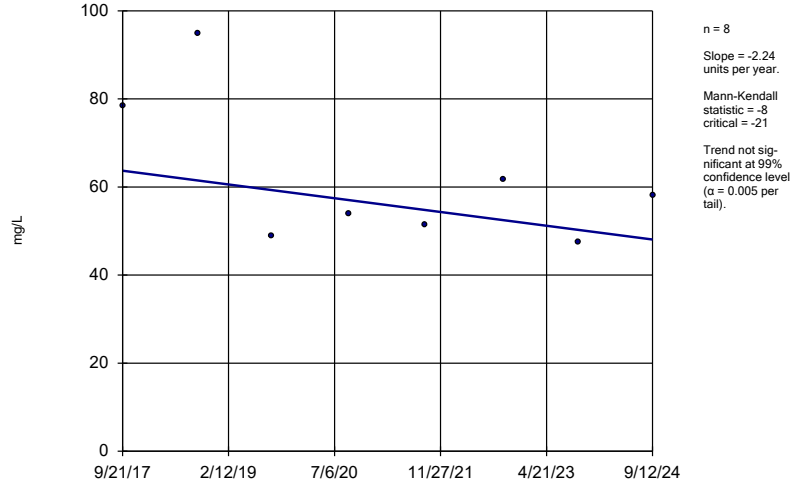
Sen's Slope Estimator

MW-4 (bg)



Constituent: Sulfate Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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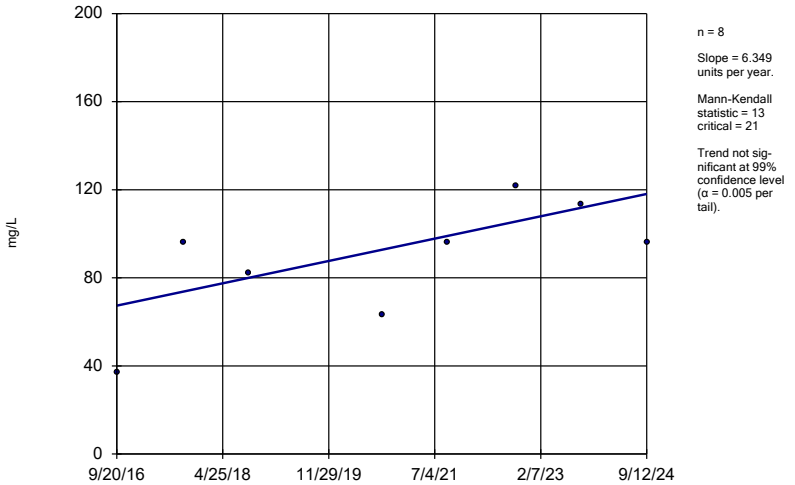
Sen's Slope Estimator

MW-5



Constituent: Sulfate Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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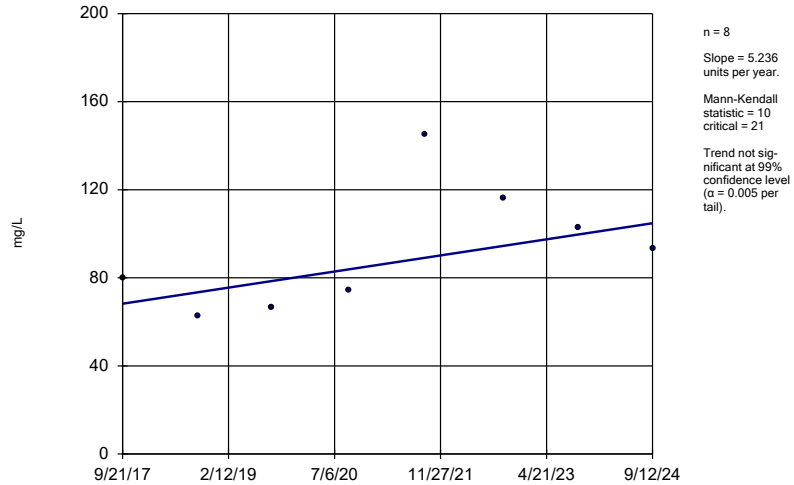
Sen's Slope Estimator

MW-6



Constituent: Sulfate Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

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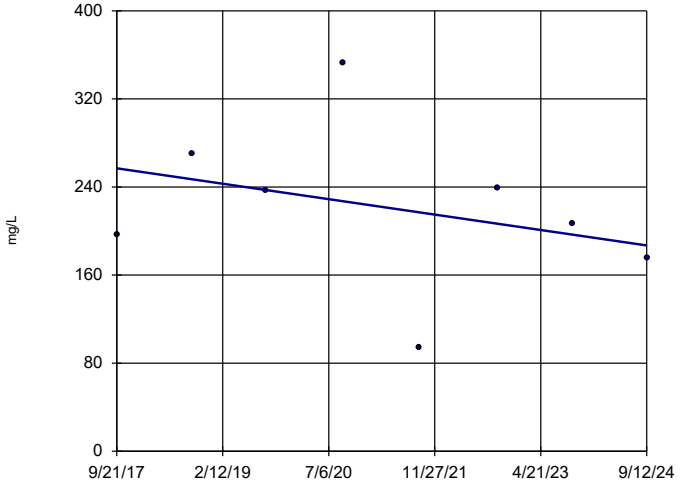
Sen's Slope Estimator

MW-7



n = 8

Slope = -10.03 units per year.

Mann-Kendall statistic = -6
critical = -21

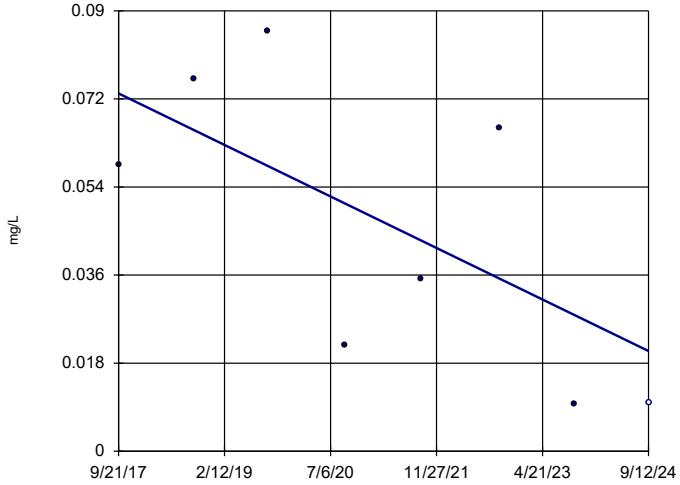
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1



n = 8

Slope = -0.007541 units per year.

Mann-Kendall statistic = -12
critical = -21

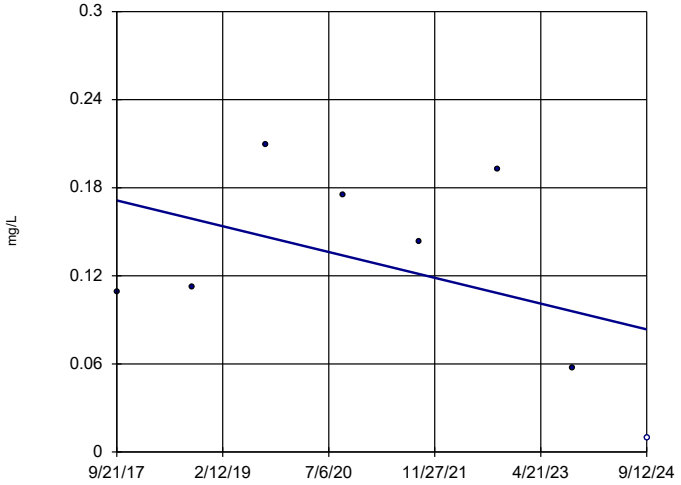
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Zinc Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-4 (bg)



n = 8

Slope = -0.01258 units per year.

Mann-Kendall statistic = -6
critical = -21

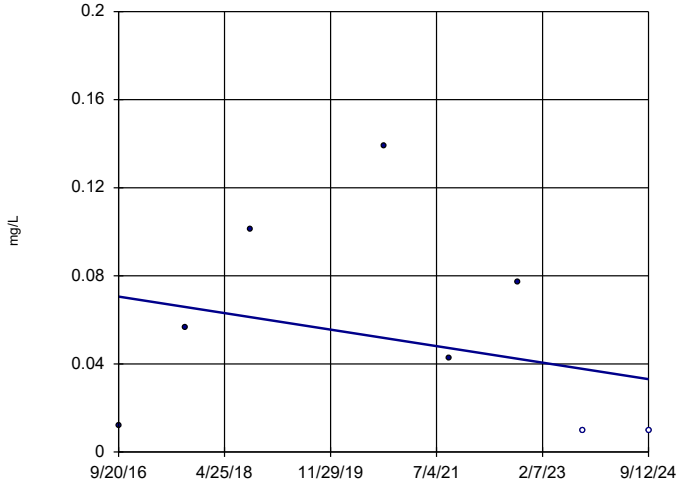
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Zinc Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sanitas™ v.10.0.23 Software licensed to SCS Engineers. EPA
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-5



n = 8

Slope = -0.004692 units per year.

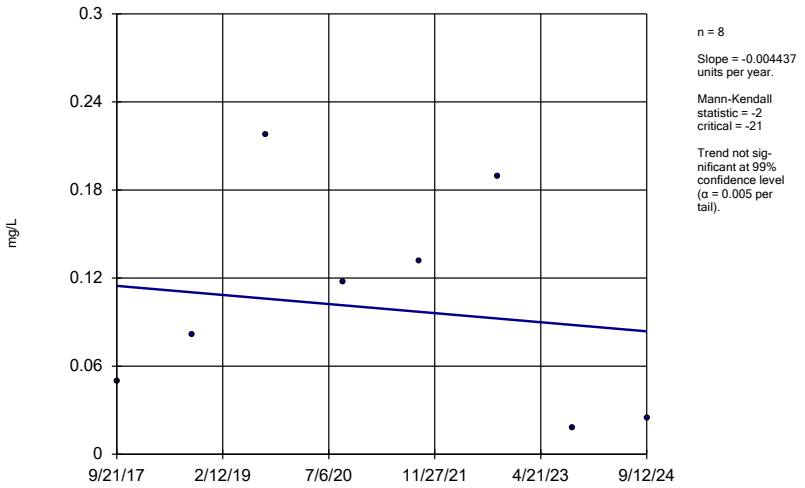
Mann-Kendall statistic = -7
critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Zinc Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall
Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Sen's Slope Estimator

MW-6



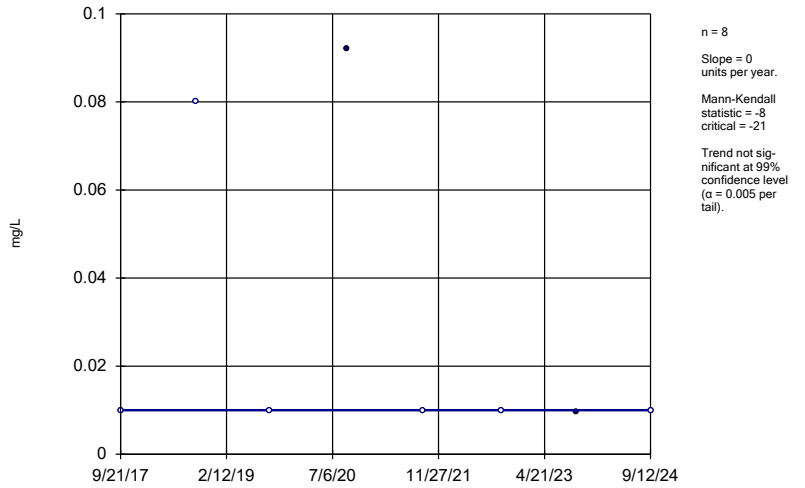
Constituent: Zinc Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-7



Constituent: Zinc Analysis Run 11/5/2024 9:15 AM View: 2024SSN - Mann Kendall

Wisdom Station CCR LF Client: Corn Belt Power Cooperative Data: CBPCO-HMSP-2024SSN-AM

Appendix E

Mann-Kendall Trend Table

Monitoring Well	Constituent Name	Calculated Statistic		
		Decreasing Trend	Stable Trend	Increasing Trend
MW-1	Arsenic	-15		
	Barium	-16		
	Cadmium		-10	
	Chloride		7	
	Cobalt	-18		
	Copper		-12	
	Iron	-18		
	Lead	-19		
	Magnesium		-11	
	Manganese		-12	
	Sulfate		0	
	Zinc		-12	
MW-4	Arsenic		6	
	Barium		-4	
	Cadmium		-11	
	Chloride		0	
	Cobalt		-8	
	Iron		4	
	Lead	-16		
	Magnesium		-2	
	Manganese		8	
	Sulfate		-8	
	Zinc		-6	
MW-5	Arsenic	-16		
	Barium		-10	
	Cadmium		-5	
	Chloride			16
	Cobalt		-3	
	Copper		-8	
	Iron	-15		
	Lead		-8	
	Magnesium		6	
	Manganese		-4	
	Sulfate			13
	Zinc		-7	
MW-6	Arsenic		-6	
	Barium		-2	
	Cadmium		-5	
	Chloride			18
	Cobalt		-8	
	Iron		-10	
	Lead		-6	
	Magnesium		0	
	Manganese	-18		
	Sulfate		10	
	Zinc		-2	
MW-7	Arsenic		-4	
	Barium	-22		
	Cadmium	-24		
	Chloride		-6	
	Cobalt		-10	
	Copper	-24		
	Iron		-10	
	Magnesium		-10	
	Manganese	-20		
	Selenium		6	
	Sulfate		-6	
	Zinc		-8	