

West Des Moines, IA

PROJECT: Mahaska Co, FY25 Env Comp, IA 27224360.25      DATE: 2/27/2025

SUBJECT: Mahaska County Sanitary Landfill, Binns & Stevens MSWLF Unit-62-SDP-01-74P-2024 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report      TRANSMITTAL ID: 00001

PURPOSE: For your approval      VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
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TO

NAME	COMPANY	EMAIL	PHONE
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REMARKS: Good afternoon Mike-

SCS Engineers, on behalf of the Mahaska County Solid Waste Management Commission, is submitting the 2024 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report for the Binns & Stevens MSWLF unit at the Mahaska County Sanitary Landfill. If you have any questions or comments regarding these reports, please contact us at the number below. Thank you.

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# Transmittal

DATE: 2/27/2025  
TRANSMITTAL ID: 00001

## DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	2/27/2025	Mahaska County Sanitary Landfill, Binns & Stevens MSWLF Unit-62-SDP-01-74P-2024 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report.pdf	

## COPIES:

Joe Farris (Mahaska County Solid Waste Management Commission)  
Nathan Ohrt (SCS Engineers)  
Tim Buelow (SCS Engineers)  
Becky Jolly

February 27, 2025  
File No. 27224360.25

Mr. Mike Smith, P.E.  
Iowa Department of Natural Resources  
Land Quality Bureau  
6200 Park Avenue  
Des Moines, Iowa 50321

Subject: 2024 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report  
Mahaska County Sanitary Landfill  
Binns & Stevens MSWLF Unit  
Permit No. 62-SDP-01-74P

Dear Mike:

SCS Engineers, on behalf of the Mahaska County Solid Waste Management Commission, has completed the required groundwater monitoring and statistical evaluation for the Binns & Stevens municipal solid waste landfill (MSWLF) unit at the Mahaska County Sanitary Landfill for the year 2024. Services were performed in general accordance with Iowa Administrative Code (IAC) 567-113.10 and the current requirements for implementation of the Hydrologic Monitoring System Plan for the Binns & Stevens MSWLF unit. Please find enclosed a copy of the 2024 Annual Water Quality Report.

Additionally, evaluations of the leachate control system and gas monitoring results for the Binns & Stevens MSWLF unit are included in accordance with IAC 113.7(5)"b"(14) and 113.9(2)"d," respectively. The 2024 Leachate Control System Performance Evaluation Report and 2024 Landfill Gas Annual Report for the Binns & Stevens MSWLF unit are included as appendices to the Annual Water Quality Report.

If you have any questions regarding these reports, please contact Nathan Ohrt at (319) 331-9613.

Sincerely,



Nathan Ohrt  
Senior Project Professional  
SCS Engineers

NPO/TCB

Copies: Mr. Joe Farris, Mahaska County Sanitary Landfill



Timothy C. Buelow, P.E.  
Senior Project Advisor  
SCS Engineers



**2024 ANNUAL WATER QUALITY REPORT,  
LEACHATE CONTROL SYSTEM PERFORMANCE EVALUATION REPORT,  
& LANDFILL GAS ANNUAL REPORT**

**FOR**

**MAHASKA COUNTY SANITARY LANDFILL  
BINNS & STEVENS MSWLF UNIT**

**OSKALOOSA, IOWA**

**SOLID WASTE PERMIT NO. 62-SDP-01-74P**

**SUBMITTAL DATE: FEBRUARY 2025**

**PREPARED FOR:**

**MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION**

**PREPARED BY:**

**SCS ENGINEERS**

## Certification

Prepared by: 

Date: 2/27/2025

Typed: Nathan Ohrt

Reviewed by: 

Date: 2/27/2025

Typed: Timothy C. Buelow, P.E.

Certification page (PE or ground water scientist signature) **113.10(1)"d"**

For the purposes of this rule, a "qualified groundwater scientist" means a scientist or an engineer who has received a baccalaureate or postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.

## Executive Summary

### ES.1 Period of Report Coverage

The period of report coverage is from January – December 2024 and includes the sampling events summarized in Table 2.

### ES.2 Report Priority

The following summarizes priorities associated with groundwater compliance for the Binns & Stevens municipal solid waste landfill unit (Binns & Stevens MSWLF unit) at the Mahaska County Sanitary Landfill (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: Open.
- Types of waste accepted: MSW, C&D, Special Waste.
- Applicable IAC rules: 2009 567-113.10.

### ES.4 Comments

Items of specific interest related to groundwater quality at the Binns & Stevens MSWLF unit are summarized below.

- The inorganic parameter concentrations at the Binns & Stevens MSWLF unit are impacted by acid mine drainage (AMD). A statistically significant increase (SSI) above background for inorganic parameters is indicated if a measured concentration is greater than the prediction limit using both interwell and intrawell statistical methods. There were no inorganic SSIs indicated during this reporting period.
- No statistically significant levels (SSLs) above the groundwater protection standards (GWPS) were measured for organic parameters during this reporting period.
- Ongoing SSIs, considered to be SSIs that were measured in both 2023 and 2024, were present for two organic parameters each in monitoring wells DW-8 and UW-10. New SSIs, considered to be SSIs that were measured in 2024 but not in 2023, were present for one organic parameter in monitoring well UW-10.
- AMD conditions are generally stable, with approximately 27 of 39 statistical trends for AMD parameters considered stable. A discussion of the AMD conditions is included in Section 6.2.
- In correspondence dated February 29, 2024 (Doc #109356), the Iowa Department of Natural Resources (DNR) requested a statistical evaluation of explosive gas level trends and an action plan to bracket the limits of gas migration and mitigate the situation. The statistical evaluation is included in Section 6.3.

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## Section 1.0 Acronyms/Abbreviations

ACM = Assessment of Corrective Measures  
AMD = Acid Mine Drainage  
C&D = Construction and Demolition  
CAMP = Corrective Action Groundwater Monitoring Program  
CL = Control Limit - Mean plus Two Standard Deviations  
DNR = Iowa Department of Natural Resources  
DO = Dissolved Oxygen  
DQR = Double Quantification Rule  
GWPS = Groundwater Protection Standard  
LEL = Lower Explosive Limit  
LCL = Lower Confidence Limit  
LN = Lognormal  
MCL = EPA Maximum Contaminant Level  
MSW = Municipal Solid Waste  
N = Normal  
NC = No Change  
NM = Not Measured  
NP = Non-Parametric  
ORP = Oxidation-Reduction Potential  
P = Parametric  
PL = Prediction Limit  
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  
VOC = Volatile Organic Compound

## Section 2.0 Site Background

### 2.1 Site Location

The Landfill property is depicted in **Figure 1**, Approved Monitoring Network. The Landfill is located approximately five miles south of Oskaloosa, Iowa. The legal description is the NW ¼ of the SE ¼ of Section 12, Township 74N, Range 16W, in Mahaska County, Iowa.

### 2.2 Geology and Hydrogeology of the Site

The *Hydrologic Monitoring System Plan* dated June 1995 (Doc #96025) prepared by Terracon Environmental, Inc., described the geology and hydrogeology of the site. Excerpts from this report are included below.

*The area in the vicinity of the landfill consists of moderate to high topographic relief resulting from glacial and erosional processes. The highest natural elevation at the site is approximately 780 feet and occurs in the northeast portion of the Site.*

*Drainage from the site generally flows to the south and east, respectively, toward an unnamed tributary of Muchakinock Creek. A drainage way is located along both the northern and eastern sides of the site. Muchakinock Creek flows into the Des Moines River approximately 3 miles southwest of the site.*

*As Figure 4 [not included] shows, the upper portion of the landfill generally consists of glacial deposits. These glacial deposits consist of brown sandy lean clay (oxidized till). Pennsylvanian age shale generally underlies the glacial and alluvial deposits at the site.*

*Figure 5 [not included] shows the undisturbed oxidized till is generally present at a depth of approximately 8 to 20 feet. The base of the oxidized till was observed at an elevation of approximately 725 feet in the western portion of the site and an approximate elevation of 730 feet in the eastern portion of the site.*

*In several areas across the site large spoil piles consisting of clay till and weathered shale are present. The spoil has thicknesses ranging from a few feet to over 50 feet below ground surface.*

*The groundwater table begins in the oxidized glacial clay till (sandy to silty lean to fat clay) to the northern portion of the sites[sic]. Beneath the till a layer of highly weathered Pennsylvanian shale bedrock unit exists across the site. Groundwater was detected within thin coal layers within the shale.*

*The overlying unconsolidated materials of Mahaska County generally consist of glacial clay and drift deposits of the Pleistocene glaciation. The deposits include the oxidized and unoxidized glacial clay tills. The oxidized till (sandy or silty lean to fat brown clay) has generally controlled the topography and geomorphology in the area of the landfill. The presences and thickness of the till unit varies across the county. Underlying the till layer is Pennsylvanian age bedrock. These rocks are primarily shale and generally are considered to act as an aquitard. However, there may be local deposits of sandstone and limestone which supply small yields of water. (Groundwater Resources of Mahaska County, 1980). Beneath the Pennsylvanian series rocks are the three major rock aquifers in use in the county. These deep rock aquifers are listed below in the order in which they are encountered.*

- *Mississippian Aquifer*
- *Silurian-Devonian*
- *Cambro-Ordovician*

*The Mississippian aquifer reportedly occurs at an elevation of approximately 600 feet near the site (Groundwater Resources of Mahaska County, 1980). The Mississippian formation was not encountered in the borings advanced at the site.*

## Section 3.0

### Figures Discussion

The following figures are included in the Figures Section of this report.

#### 3.1 Figure 1 - Approved Monitoring Network

The Landfill property and the hydrologic monitoring system plan (HMSP) monitoring network are depicted in **Figure 1**. **Figure 1** indicates the respective monitoring programs of the HMSP monitoring points.

#### 3.2 Figure 2 - Groundwater Contours

The groundwater contours in **Figure 2** were generated based on water levels measured during the November 2024 sampling event. The predominant flow direction over the majority of the landfill area is to the south-southeast.

#### 3.3 Figure 3 - Reporting Period Detection Summary

**Figure 3** shows the range of measured concentrations by monitoring point for the HMSP monitoring points during this reporting period. Further discussion of the detected constituents is included in Section 6.0 – Data Evaluation and Summary of this report.

## Section 4.0

### Standards History Graphs

The prediction limits for the 2018 through 2020 time period were compiled from the 2018, 2019, and 2020 Annual Water Quality Reports for the Binns & Stevens MSWLF unit (Docs #94309, 96912, and 99663, respectively).

During the 2021 and 2022 reporting periods, the GWPS on the graphs increased in many cases compared to previous reports. This increase was due to the prediction limits being used as the GWPS when background was higher than the statewide standards, while the statewide standards were used as the GWPS in the previous reports.

In addition, prediction limits calculated during the 2021 and 2022 reporting periods by Evora Consulting were markedly different for multiple constituents than those obtained from the 2018-2020 report prepared by a different consultant. For the 2021-2022 time period compared to the 2020 time period, the prediction limits showed a significant decrease for antimony, selenium, and thallium; the prediction limits showed a significant increase for arsenic, barium, cadmium, lead, vanadium, and zinc; and the prediction limits remained fairly stable for beryllium, chromium, cobalt, copper, nickel, and silver. The changes appear likely to be the result of different statistical methodologies for calculating the prediction limits.

The 2024 prediction limits were consistent with the 2021-2023 values. In future reports, the data from prior to 2021 will be removed from the standards history graphs.

In some cases, the prediction limits are above the GWPS and in some cases the prediction limits are below the GWPS. However, because of the documented AMD impact at the Binns & Stevens MSWLF unit, the GWPSs are not of great significance for the inorganic parameters, as the health standards do not consider the AMD effect. Standards history graphs for the Appendix I metals are included in **Appendix H**.

## Section 5.0

### QA/QC Summary

The quality assurance/quality control (QA/QC) program for the Binns & Stevens MSWLF unit follows similar protocols as included in the HMSP. Data validation procedures were performed on analytical results for laboratory quality control samples and a quality assurance assessment of the data was conducted as the data were generated. The QA review procedure provided documentation of the accuracy and precision of the analytical data and confirmed that the analyses were sufficiently sensitive to detect constituents at levels below regulatory standards when technically feasible with the laboratory method utilized. SCS then conducted QA/QC data validation of the produced data, which included a review of sample handling, analytical sensitivity, blanks, accuracy, and precision. A summary of the laboratory QA/QC and data validation can be found in **Appendix B-1**, Laboratory Analytical Data Sheets, and **Appendix B-2**, Data Validation Documentation, respectively.

## Section 6.0

### Data Evaluation and Summary

Detection and assessment monitoring statistical evaluations in accordance with the requirements of Iowa Administrative Code (IAC) 567-113.10(5) and 113.10(6) were conducted for the groundwater analytical data collected during the 2024 reporting period. The statistical evaluations for samples collected during this reporting period are located in **Appendix D**, Statistical Method and Output, of this report.

#### 6.1 Data Evaluation

Groundwater monitoring for the Landfill consists of samples from monitoring wells encompassing the downgradient perimeters of the unit and a groundwater underdrain discharge point located downgradient of the leachate storage lagoon. The range of measured concentrations for the detected constituents during this reporting period is shown in **Figure 3**, Reporting Period Detection Summary.

During this reporting period, volatile organic compounds (VOCs) were measured in monitoring wells DW-8 and UW-10. No VOC concentrations were above a GWPS. Site-wide maximum concentrations for metals were measured in monitoring wells DW-8, DW-15, DW-23, and DW-24. No site-wide maximum concentrations for metals were measured in monitoring wells UW-10, UW-11, PZ-14, and DW-19. No SSLs were indicated for the organic parameters.

SSIs for inorganic parameters for the Binns & Stevens MSWLF unit are defined as constituent-well pairs that have an indicated SSI using both interwell and intrawell statistical methods; no inorganic SSIs were measured during this reporting period. Ongoing SSIs, considered SSIs that were present in both 2023 and 2024, were indicated for two organic parameters in both monitoring wells DW-8 and UW-10 (Table 7). New SSIs, considered SSIs that were indicated in 2024 but not in 2023, were present for one organic parameter in monitoring well DW-8 (Tables 6 and 7). A tracking of historical SSIs and SSLs is included in Table 10.

#### 6.2 AMD Evaluation

The following description of AMD impact on groundwater quality at the Binns & Stevens MSWLF unit is from the 2020 Annual Water Quality Report prepared by Terracon Consultants, Inc., dated January 29, 2021 (Doc #99663).

*Based on Permit Amendment 21, Iowa DNR approved the Alternative Source Demonstration indicating Acid Mine Drainage as a potential source of elevated levels of inorganic parameters. A condition of Permit Amendment 21 includes the additional sampling for the parameters Alkalinity, Aluminum, Iron, Sulfate, and pH. AMD results in low pH groundwater with some or all of the following characteristics: increased sulfate, iron, and aluminum concentrations, and low calcareous materials.*

Mann-Kendall trend evaluation at 80% confidence ( $\alpha=0.2$ ) was performed for AMD parameters alkalinity, aluminum, iron, sulfate, and pH. Statistically significant decreasing trends were indicated for pH in monitoring well DW-15, alkalinity and pH in monitoring well PZ-14, iron and sulfate in monitoring well UW-10, and iron in monitoring well MW-11. Statistically significant increasing trends were indicated for alkalinity and sulfate in monitoring well DW-19, aluminum and sulfate in monitoring well MW-24, iron in monitoring well PZ-14, and pH in monitoring well UW-11.

Of the 39 analyzed trends, 27 had a Mann-Kendall statistic considered stable. Monitoring wells DW-8 and DW-23 had only stable trends. Monitoring wells DW-19 and DW-24 had only stable or statistically significant increasing trends. Monitoring wells DW-15 and UW-10 had only stable and

statistically significant decreasing trends. Monitoring well PZ-14 and UW-11 had stable parameters and both increasing and decreasing statistically significant trends. AMD parameters appear to be generally stable, but decreasing pH concentrations in four monitoring wells may indicate groundwater conditions are deteriorating in some areas of the Landfill

A summary table of the Mann-Kendall trend evaluation for the AMD parameters is included in **Appendix G**. A summary of analytical results for the AMD parameters is included in **Appendix C**.

### 6.3 Landfill Gas Statistical Evaluation

In correspondence dated February 29, 2024 (Doc #109356), the Iowa Department of Natural Resources (DNR) requested a statistical evaluation of explosive gas level trends and an action plan to bracket the limits of gas migration and mitigate the situation. To evaluate the effectiveness of the existing landfill gas control system at the Landfill, methane concentration data as % volume for the period from 2022-2024 was graphed. A linear regression trendline including equation and R<sup>2</sup> values were calculated. An R<sup>2</sup> value is between zero and one. The closer to one, the better the “fit” of the data to the regression. The calculated R<sup>2</sup> values are included in the tables below and the graphs are in the attached **Appendix I**.

Point ID#	R <sup>2</sup> Value	Increasing/Decreasing
SG-3	0.0748	Increasing
SG-5R	0.0008	Increasing
UW-9R	0.0029	Decreasing
UW-10	0.4817	Decreasing
VP-3	0.0333	Decreasing
VP-4	0.0058	Decreasing

Point ID#	R <sup>2</sup> Value	Increasing/Decreasing
VP-5	0.0258	Decreasing
VP-6	0.3681	Decreasing
VP-7	0.0086	Increasing
VP-8	0.4268	Decreasing
GV-1	0.1428	Decreasing
GV-2	0.0091	Decreasing

The low R<sup>2</sup> values indicate the data vary significantly from being linear. Monitoring points SG-3, SG-5R, and VP-7 indicated some degree of increasing trends based on the slopes of the regression lines and monitoring points UW-9R, UW-10, VP-3, VP-4, VP-5, VP-6, VP-8, GV-1, and GV-2 indicated some degree of decreasing trends based on the slopes of the regression lines – see graphs in **Appendix I**. However, due to the non-linear form of the datasets, the trend indications should not be conclusive. In most cases, the methane concentrations in the monitoring points were significantly above the compliance level.

An action plan, including a schedule and tasks, to bracket the limits of gas migration and mitigate the situation will be submitted under separate cover by April 30, 2025.



## **Section 7.0** **Recommendations**

### **7.1 Site Impact on Groundwater**

There were no inorganic SSLs or organic SSLs indicated during this reporting period.

Acid mine drainage (AMD) conditions are generally stable, with the majority of trends for AMD parameters considered generally stable.

### **7.2 Proposed Monitoring**

Anticipated groundwater sampling for the 2025 reporting period is shown in Table 2.

### **7.3 Proposed Monitoring Well Changes**

No changes are proposed at this time.

## Tables

**Table 1**  
**Monitoring Program Summary Table**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

Monitoring Well	Formation <sup>(1)</sup>	Current Monitoring Program	Change for next sampling event	Constituents with SSIs in the 2024 Reporting Period	Constituents with SSLs	Total # of Samples in each monitoring program		
						Detection	Assessment	Corrective Action
<b>HMSP Monitoring Points</b>								
DW-15	Till to weathered shale	Background	No change	Not applicable	Not applicable	37		
DW-19	Till to weathered shale	Background	No change	Not applicable	Not applicable	37		
UW-11	Weathered shale	Background	No change	Not applicable	Not applicable	43		
UW-21	Clay spoil	Background	No change	Not applicable	Not applicable	31		
DW-8	Till to weathered shale	Assessment	No change	1,1-Dichloroethane, cis-1,2-Dichloroethene	None		37	
DW-23	Clay spoil	Assessment	No change	None	None		31	
DW-24	Clay spoil	Detection	No change	None	Not applicable	15		
PZ-14	Till to weathered shale	Detection	No change	None	Not applicable	36		
UW-9R	Till to weathered shale	Detection	No change	None (no samples)	Not applicable	9		
UW-9RA	Till to weathered shale	Detection	No change	None (no samples)	Not applicable	0		
UW-10	Till to weathered shale	Assessment	No change	1,4-Dichlorobenzene, Benzene, Vinyl Chloride	None		41	
GU-1	Lagoon Underdrain	Detection	No change	None (no samples)	Not applicable	0		
<b>Other Monitoring Points</b>								
DW-6	Weathered till	Water Level						
DW-7	Till to weathered shale	Water Level						
PZ-7A	Weathered till	Water Level						

Notes:

(1) Obtained from screened interval on boring logs.

2) Indicated SSIs in monitoring wells in the assessment monitoring program are not retested. Therefore, the indicated SSIs in the table are not confirmed.

SSI = Statistically Significant Increase above background.

SSL = Statistically Significant Level above groundwater protection standard.

**Table 2**  
**Monitoring Program Implementation Schedule**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

Monitoring Well	Recent Sampling Dates and Constituents		Upcoming Sampling Dates and Constituents		Full Appendix II Sample Dates	
	May 2024	November 2024	1 <sup>st</sup> 2025 Semi-Annual	2 <sup>nd</sup> 2025 Semi-Annual	Previously Collected	Next Event
DW-8	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	10/1/2017, 9/20/2022	2027
UW-9R	Not sampled - Dry	Not sampled - Dry	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
UW-9RA	Not sampled - Dry	Not sampled - Dry	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
UW-10	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	10/1/2017, 9/21/2022	2027
UW-11	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
PZ-14	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
DW-15	Appendix I Metals, Alkalinity, Sulfate	Not sampled - Dry	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
DW-19	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
UW-21	Not sampled - Dry	Not sampled - Dry	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
DW-23	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	10/1/2017, 9/22/2022	2027
DW-24	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable
GU-1	Not sampled - Dry	Not sampled - Dry	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Appendix I, TSS, Alkalinity, Aluminum, Iron, Sulfate	Not applicable	Not applicable

Comments:

TSS - Total Suspended Solids.

**Table 3**  
**Monitoring Well Maintenance and Performance Re-Evaluation Schedule**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

Compliance with:	Monitoring Calendar Years				
	2022	2023	2024	2025	2026
567 IAC 113.10(2)"f"(1) high and low water levels (biennial)	Completed	Completed	Included	Scheduled	Scheduled
567 IAC 113.10(2)"f"(2) changes in the hydrologic setting and flow paths	Completed	Completed	Included	Scheduled	Scheduled
567 IAC 113.10(2)"f"(3) well depths	Completed	Completed	Included	Scheduled	Scheduled
567 IAC 113.10(2)"f"(4) well recharge rates and chemistry	Completed		Included		Scheduled
Waste separation from ground water 113.6(2)"l"	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

**Table 4**  
**Monitoring Well Performance and Maintenance Summary**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

Well	Top of casing	Top of Screen	Total Depth	Date of Measurements		Maximum Depth Discrepancy (ft)	Initial Flow Rate (L/min) Date	Recent Flow Rate (L/min) Date	% Change	
				5/2024	11/2024					
DW-8	747.43	727.5	30.4	Groundwater Level (ft)	19.61	19.30	2.1	0.16	0.18	11%
				Groundwater Elevation (Ft MSL)	727.82	728.13				
				Measured Well Depth (ft)	28.3	28.4				
				Submerged screen	Y	Y				
UW-9R	776.95	762.6	40.4	Groundwater Level (ft)	39.96	Dry	0.8	NA	NA	NA
				Groundwater Elevation (Ft MSL)	736.99	NA				
				Measured Well Depth (ft)	40.0	39.6				
				Submerged screen	N	N				
UW-9RA	776.10	738.6	42.5	Groundwater Level (ft)	42.29	42.35	-0.1	NA	NA	NA
				Groundwater Elevation (Ft MSL)	733.81	733.75				
				Measured Well Depth (ft)	42.6	42.5				
				Submerged screen	N	N				
UW-10	760.94	746.0	27.9	Groundwater Level (ft)	13.62	14.50	2.6	0.17	0.18	10%
				Groundwater Elevation (Ft MSL)	747.32	746.44				
				Measured Well Depth (ft)	25.3	25.3				
				Submerged screen	Y	Y				
UW-11	744.35	733.4	33.0	Groundwater Level (ft)	18.90	18.21	-6.1	0.17	0.17	0%
				Groundwater Elevation (Ft MSL)	725.45	726.14				
				Measured Well Depth (ft)	39.1	31.0				
				Submerged screen	N	N				
PZ-14	715.08	712.2	16.2	Groundwater Level (ft)	9.50	8.90	-0.7	0.17	0.18	10%
				Groundwater Elevation (Ft MSL)	705.58	706.18				
				Measured Well Depth (ft)	16.9	16.1				
				Submerged screen	N	N				
DW-15	739.90	716.3	33.6	Groundwater Level (ft)	29.55	Dry	3.1	0.19	0.18	-2%
				Groundwater Elevation (Ft MSL)	710.35	NA				
				Measured Well Depth (ft)	34.2	30.5				
				Submerged screen	N	N				
DW-19	740.11	722.8	27.3	Groundwater Level (ft)	14.85	16.80	-0.1	0.18	0.18	0%
				Groundwater Elevation (Ft MSL)	725.26	723.31				
				Measured Well Depth (ft)	27.4	27.4				
				Submerged screen	Y	Y				
UW-21	756.79	726.9	39.9	Groundwater Level (ft)	36.54	Dry	-0.2	0.19	0.17	-13%
				Groundwater Elevation (Ft MSL)	720.25	NA				
				Measured Well Depth (ft)	40.1	40.1				
				Submerged screen	N	N				
DW-23	726.01	706.4	24.7	Groundwater Level (ft)	18.04	17.90	-0.3	0.16	0.16	0%
				Groundwater Elevation (Ft MSL)	707.97	708.11				
				Measured Well Depth (ft)	25.0	25.0				
				Submerged screen	Y	Y				
DW-24	717.48	708.5	14.0	Groundwater Level (ft)	6.36	10.65	-0.5	0.18	0.18	-5%
				Groundwater Elevation (Ft MSL)	711.12	706.83				
				Measured Well Depth (ft)	14.1	14.5				
				Submerged screen	Y	N				

Comments:

NA - Not Available.

NM - Not Measured.

1) The majority of measured well depths were within 1.0 foot of the installed depths. Although monitoring wells DW-8, DW-15, UW-10, and UW-11 had measured well depths different than their installed depths, samples are consistently collected (though a sample was not produced in DW-15 in November 2024). It does not appear that siltation is affecting the ability of the monitoring wells to produce samples. The November 2024 well depth measurement of monitoring well UW-11 indicates the well depth measured during the May 2024 sampling event was in error.

**Table 5**  
**Background and GWPS Summary Tables**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

**Interwell Background/GWPS (DW-15, DW-19, UW-11, and UW-21)**

Constituent	Units	Samples	Detections	Min	Max	Mean	Background Level	Statistical Test	GWPS	Source
Antimony (Sb)	mg/L	105	1	0.00025 (1/2 RL)	0.00155*	0.00097	0.00155	PL (NP)	0.006	MCL
Arsenic (As)	mg/L	105	32	0.000724*	0.11	0.00536	0.11	PL (NP)	0.11	SSS
Barium (Ba)	mg/L	105	105	0.00977	1.82	0.10228	1.82	PL (NP)	2	MCL
Beryllium (Be)	mg/L	105	10	0.000288*	0.0138	0.00208	0.0138	PL (NP)	0.0138	SSS
Cadmium (Cd)	mg/L	105	35	0.00005 (1/2 RL)	0.0109	0.00075	0.0109	PL (NP)	0.0109	SSS
Chromium (Cr)	mg/L	105	12	0.00146*	0.183	0.01034	0.183	PL (NP)	0.183	SSS
Cobalt (Co)	mg/L	105	86	0.0002 (1/2 RL)	1.61	0.27675	1.61	PL (NP)	1.61	SSS
Copper (Cu)	mg/L	105	34	0.002 (1/2 RL)	0.239	0.01290	0.239	PL (NP)	1.3	MCL
Lead (Pb)	mg/L	105	28	0.000243*	0.138	0.00619	0.138	PL (NP)	0.138	SSS
Nickel (Ni)	mg/L	105	73	0.00191*	0.985	0.18252	0.985	PL (NP)	0.985	SSS
Selenium (Se)	mg/L	102	14	0.002 (1/2 RL)	0.026	0.00305	0.026	PL (NP)	0.05	MCL
Silver (Ag)	mg/L	105	1	0.0005 (1/2 RL)	0.005 (1/2 RL)	0.00166	0.005	PL (NP)	0.1	SWS
Thallium (Tl)	mg/L	105	1	0.000428*	0.0025 (1/2 RL)	0.00132	0.0025	PL (NP)	0.0025	SSS
Vanadium (V)	mg/L	105	12	0.00111*	0.291	0.01643	0.291	PL (NP)	0.291	SSS
Zinc (Zn)	mg/L	105	61	0.004 (1/2 RL)	2.33	0.09831	2.33	PL (NP)	2.33	SSS

Notes:

Background levels based on calculated prediction limits or reporting limits, as applicable.

\* - J flag. Concentration is greater than the method detection limit but less than the reporting limit; the concentration is estimated.

Acronyms/Abbreviations:

RL = Reporting Limit

PL = Prediction Limit

MCL = EPA Maximum Contaminant Level

GWPS = Groundwater Protection Standard (mg/L)

DQR = Double Quantification Rule

NP = Non-Parametric

SSS = Site-Specific GWPS

P = Parametric

SWS = Statewide Standard

- 1) Water quality results and effectiveness of the statistical data evaluation criteria: The statistical evaluation is performed in accordance with the Unified Guidance and DNR requirements.
- 2) Changes to the previous statistical method during reporting period: None.
- 3) Re-sampling strategy: Retesting is performed on a 1-of-2 scheme.
- 4) Justification for data exclusion: None.

**Table 6**  
**Summary of Well/Detected Constituent Pairs With No Previous SSIs**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

Well	Constituent	Units	Most recent result	Background Standard
UW-10	Vinyl Chloride	µg/L	1.01	<1

1) This table includes monitoring well/constituent pairs that had an SSI indicated in 2024 that was not indicated in 2023.

2) Indicated SSIs in monitoring wells in the assessment monitoring program are not retested. Therefore, the indicated SSIs in the table are not confirmed.

Comments:

1) Problems with the current detection network: None.

2) Schedule to implement remedies: None.

3) Alternative constituent or sample frequency changes: None.

4) Significant changes to calculated prediction limits: There were no significant changes to the prediction limits during this reporting period.

5) Resampling strategy: Retesting is performed on a 1-of-2 retesting scheme.



**Table 7**  
**Summary Table of Ongoing and Newly Identified SSIs**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 84-SDP-01-74P**

Well	Constituent	Units	Most recent result	Background Standard	Lower Confidence Limit	GWPS	Sample Dates		
							Initial Exceedance	Resample(s)	5 <sup>th</sup> background sample
DW-8	1,1-Dichloroethane	µg/L	1.49	<1	0.6593	140	2/8/2023	NA	12/11/2008
	cis-1-2,Dichloroethene	µg/L	1.29	<1	0.368	70	2/8/2023	NA	4/22/2010
UW-9R	None								
UR-9RA	None								
UW-10	1,4-Dichlorobenzene	µg/L	5.7	<1	4.831	75	4/8/2008	NA	12/11/2008
	Benzene	µg/L	2	<0.5	1.177	5	4/8/2008	NA	12/11/2008
	Vinyl Chloride	µg/L	1.01	<1	0.4886	2	5/14/2024	NA	12/11/2008
PZ-14	None								
DW-23	None								
DW-24	None								

1) Shaded rows denote constituent/well pairs that had an SSI indicated in 2024 that was not indicated in 2023. Unshaded rows denote constituent/well pairs with SSIs indicated during both the 2023 and 2024 reporting periods.

2) Indicated SSIs in monitoring wells in the assessment monitoring program are not retested. Therefore, the indicated SSIs in the table are not confirmed.

Comments:

- 1) Problems with the current assessment network: None.
- 2) Proposed remedies: None.
- 3) Plume delineation strategies: Not applicable.
- 4) Property owner notifications: Not applicable.



**Table 9**  
**Summary of Groundwater Chemistry**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

The Summary of Groundwater Chemistry for Appendix II and AMD parameters is located in Appendix C.

**Table 10**  
**Historical SSI and SSL**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

**Key**

SSI - Statistically Significant Increase above background  
 SSL - Statistically Significant Level above groundwater protection standard

		S p r i n g	F a l l	S p r i n g	F a l l	S p r i n g	F a l l	S p r i n g	F a l l	S p r i n g	F a l l	S p r i n g	F a l l
<b>Well</b>	<b>Constituent</b>	2019	2019	2020	2020	2021	2021	2022	2022	2023	2023	2024	2024
DW-8	1,1-Dichloroethane												
	cis-1,2-Dichloroethene												
UW-9R	No samples												
UW-9RA	No samples												
UW-10	Chloroethane												
	1,1-Dichloroethane												
	1,4-Dichlorobenzene												
	Benzene												
	cis-1,2-Dichloroethene												
	Vinyl Chloride												
PZ-14	None												
DW-23	None												
DW-24	None												

**Comments:**

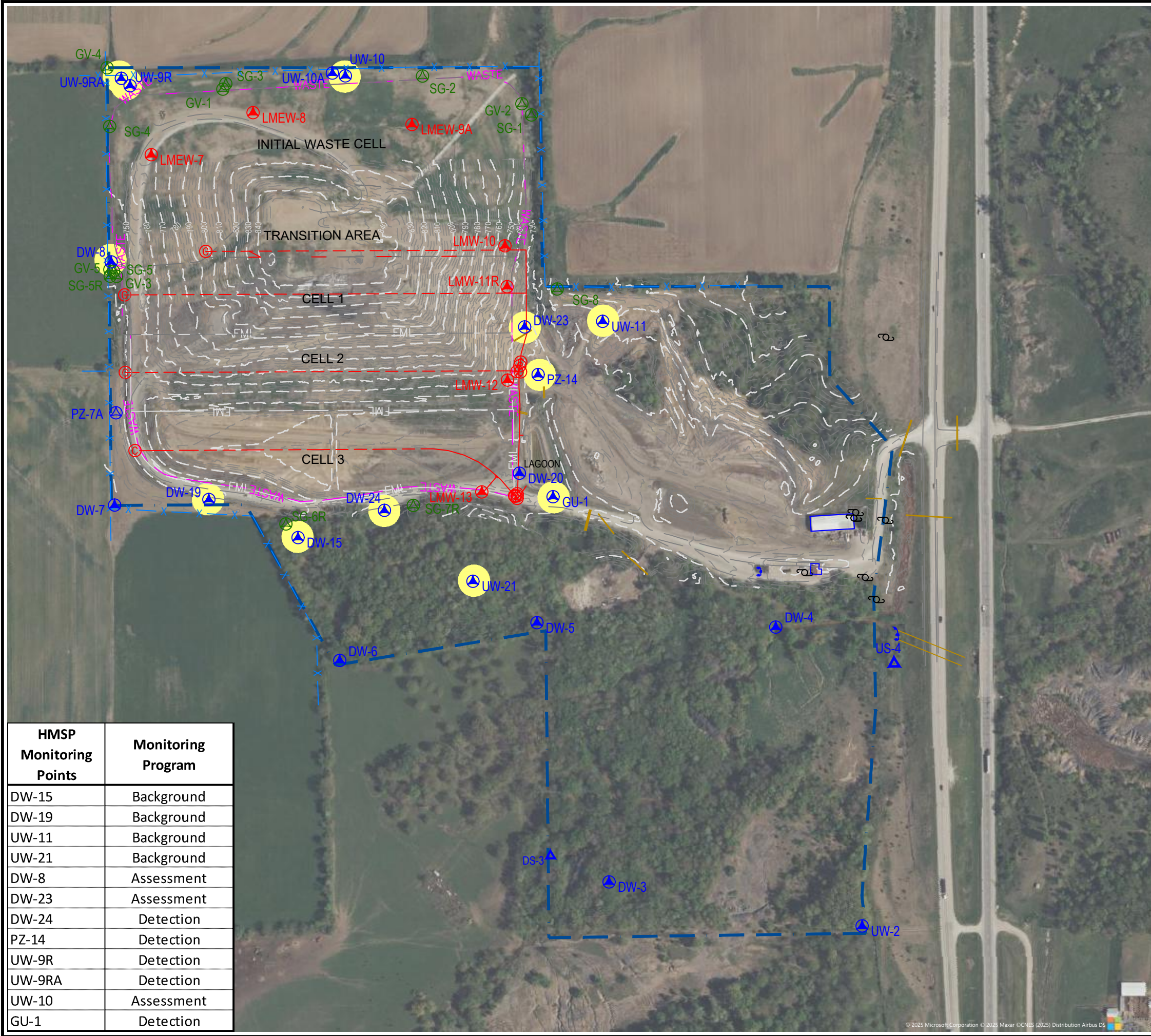
- 1) Inorganic SSIs on this table were indicated using both interwell and intrawell prediction limits. A detection of a VOC was considered an SSI for the purposes of this table.
- 2) Indicated SSIs in monitoring wells in the assessment monitoring program are not retested. Therefore, the indicated SSIs in the table are not confirmed.

**Table 11**  
**Corrective Action Trend Analysis**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill**  
**Permit No. 62-SDP-01-74P**

Well	Current SSL	Trend	Calculated S	Critical S	Total N	Projected Date to Completion
None						

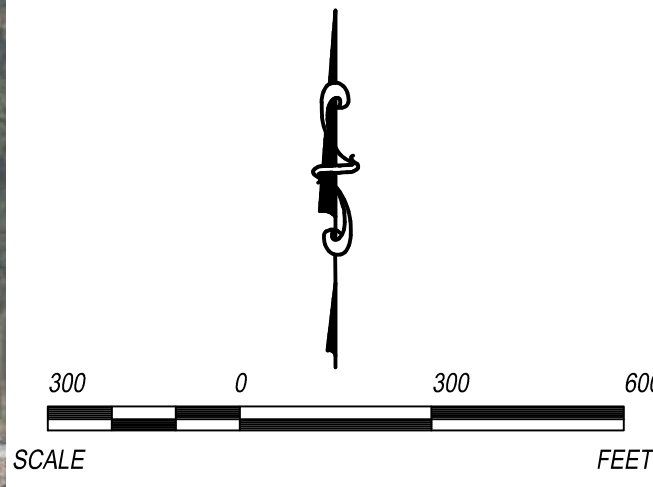
## Figures

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- LEGEND:**
- EXISTING 2' CONTOUR
  - EXISTING 10' CONTOUR
  - APPROXIMATE EXISTING WASTE BOUNDARY
  - F-M-L BOUNDARY
  - EXISTING CELL BOUNDARY
  - FUTURE CELL BOUNDARY
  - APPROXIMATE PROPERTY BOUNDARY
  - BUILDING
  - ▬ GRAVEL ROAD
  - ▬ PAVED ROAD
  - X — FENCELINE
  - X — CULVERT
  - DW-1 DOWN GRADIENT MONITORING WELL
  - UW-1 UP GRADIENT MONITORING WELL
  - MW-1 HMSP WELL
  - LMEW-1 LEACHATE EXTRACTION WELL
  - LMPZ-1 LEACHATE PIEZOMETER
  - PZ-1 GROUNDWATER PIEZOMETER
  - GV-1 LANDFILL GAS WELL
  - DS-3 SURFACE WATER SAMPLING POINT
  - POLE

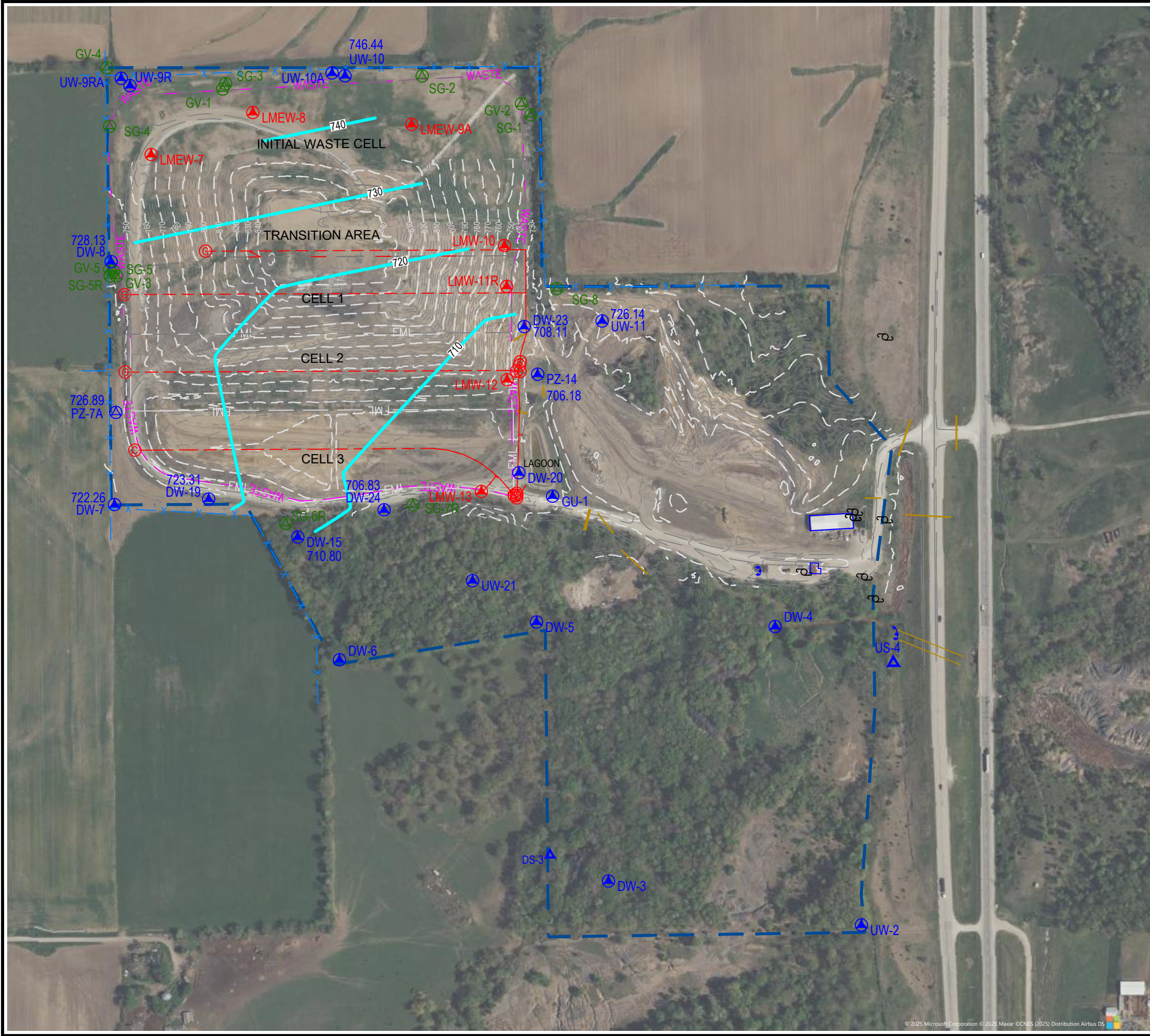
HMSP Monitoring Points	Monitoring Program
DW-15	Background
DW-19	Background
UW-11	Background
UW-21	Background
DW-8	Assessment
DW-23	Assessment
DW-24	Detection
PZ-14	Detection
UW-9R	Detection
UW-9RA	Detection
UW-10	Assessment
GU-1	Detection



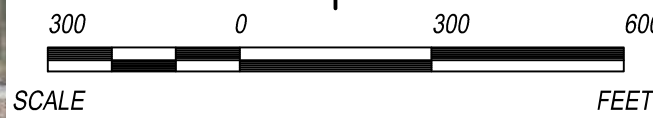
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PROJECT TITLE	<b>BINNS AND STEVENS SITE 2024 ANNUAL WATER QUALITY REPORT</b>				
CLIENT	<b>MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION</b> 2979 US HIGHWAY 63 OSKALOOSA, IA				
SCS ENGINEERS	1680 ALL STATE COURT, SUITE 100 WEST DES MOINES, IA 50265 PH. (515) 631-6160				
CADD FILE:	MAHASKA2024_AWQR_V0.0.DWG				
DATE:	2/27/25				
DRAWING NO.	<b>1</b>				

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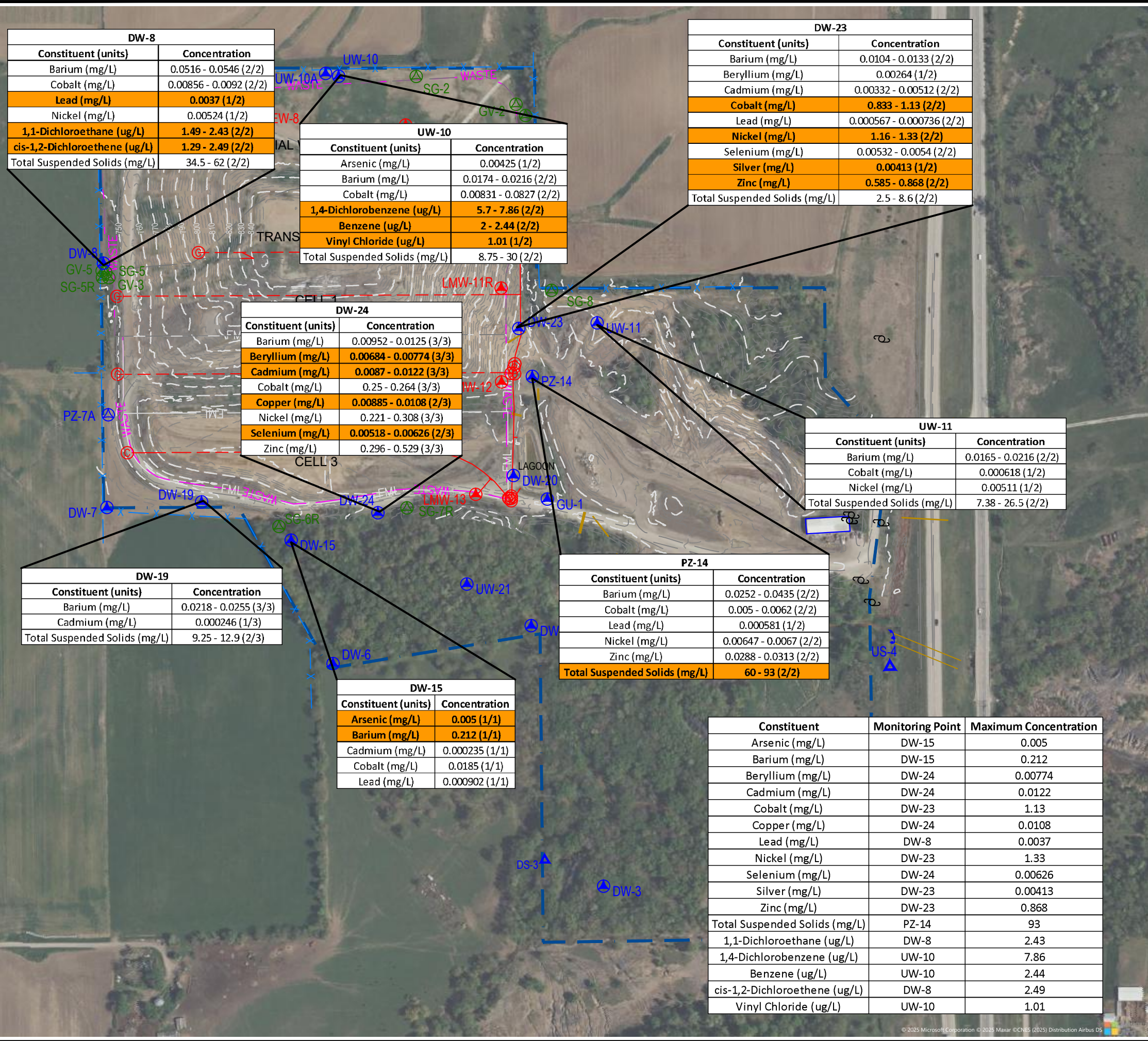
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  - EXISTING 10' CONTOUR
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  - FML BOUNDARY
  - EXISTING CELL BOUNDARY
  - FUTURE CELL BOUNDARY
  - APPROXIMATE PROPERTY BOUNDARY
  - BUILDING
  - ▬ GRAVEL ROAD
  - ▬ PAVED ROAD
  - X — FENCELINE
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  - DW-1 DOWN GRADIENT MONITORING WELL
  - UW-1 UP GRADIENT MONITORING WELL
  - LMEW-1 LEACHATE EXTRACTION WELL
  - LPZ-1 LEACHATE PIEZOMETER
  - PZ-1 GROUNDWATER PIEZOMETER
  - GV-1 LANDFILL GAS WELL
  - DS-3 SURFACE WATER SAMPLING POINT
  - POLE
  - GROUNDWATER CONTOUR BASED ON 11/18/2024 MEASUREMENTS



CLIENT <b>MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION</b> 2979 US HIGHWAY 63 OSKALOOSA, IA	SHEET TITLE <b>GROUNDWATER CONTOURS</b> PROJECT TITLE <b>BINNS AND STEVENS SITE 2024 ANNUAL WATER QUALITY REPORT</b>	REV.	DATE	CK	BY
		△	△	△	△
CADD FILE: MAHASKA2024_AWQR_V0.0.DWG	DATE: 2/27/25	DRAWING NO. <b>2</b>			
SCS ENGINEERS 1680 ALL STATE COURT, SUITE 100 WEST DES MOINES, IA 50265 PH. (515) 631-6160	PROJ. NO. 27224360_25	DWG. BY: IAC	CHK. BY: IAC	PROJ. MGR. NPO	NPO

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**LEGEND:**

- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- APPROXIMATE EXISTING WASTE BOUNDARY
- FML BOUNDARY
- EXISTING CELL BOUNDARY
- FUTURE CELL BOUNDARY
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- LPZ-1 LEACHATE PIEZOMETER
- PZ-1 GROUNDWATER PIEZOMETER
- GV-1 LANDFILL GAS WELL
- DS-3 SURFACE WATER SAMPLING POINT
- POLE

DW-8	
Constituent (units)	Concentration
Barium (mg/L)	0.0516 - 0.0546 (2/2)
Cobalt (mg/L)	0.00856 - 0.0092 (2/2)
Lead (mg/L)	0.0037 (1/2)
Nickel (mg/L)	0.00524 (1/2)
1,1-Dichloroethane (ug/L)	1.49 - 2.43 (2/2)
cis-1,2-Dichloroethene (ug/L)	1.29 - 2.49 (2/2)
Total Suspended Solids (mg/L)	34.5 - 62 (2/2)

UW-10	
Constituent (units)	Concentration
Arsenic (mg/L)	0.00425 (1/2)
Barium (mg/L)	0.0174 - 0.0216 (2/2)
Cobalt (mg/L)	0.00831 - 0.00827 (2/2)
1,4-Dichlorobenzene (ug/L)	5.7 - 7.86 (2/2)
Benzene (ug/L)	2 - 2.44 (2/2)
Vinyl Chloride (ug/L)	1.01 (1/2)
Total Suspended Solids (mg/L)	8.75 - 30 (2/2)

DW-23	
Constituent (units)	Concentration
Barium (mg/L)	0.0104 - 0.0133 (2/2)
Beryllium (mg/L)	0.00264 (1/2)
Cadmium (mg/L)	0.00332 - 0.00512 (2/2)
Cobalt (mg/L)	0.833 - 1.13 (2/2)
Lead (mg/L)	0.000567 - 0.000736 (2/2)
Nickel (mg/L)	1.16 - 1.33 (2/2)
Selenium (mg/L)	0.00532 - 0.0054 (2/2)
Silver (mg/L)	0.00413 (1/2)
Zinc (mg/L)	0.585 - 0.868 (2/2)
Total Suspended Solids (mg/L)	2.5 - 8.6 (2/2)

DW-24	
Constituent (units)	Concentration
Barium (mg/L)	0.00952 - 0.0125 (3/3)
Beryllium (mg/L)	0.00684 - 0.00774 (3/3)
Cadmium (mg/L)	0.0087 - 0.0122 (3/3)
Cobalt (mg/L)	0.25 - 0.264 (3/3)
Copper (mg/L)	0.00885 - 0.0108 (2/3)
Nickel (mg/L)	0.221 - 0.308 (3/3)
Selenium (mg/L)	0.00518 - 0.00626 (2/3)
Zinc (mg/L)	0.296 - 0.529 (3/3)

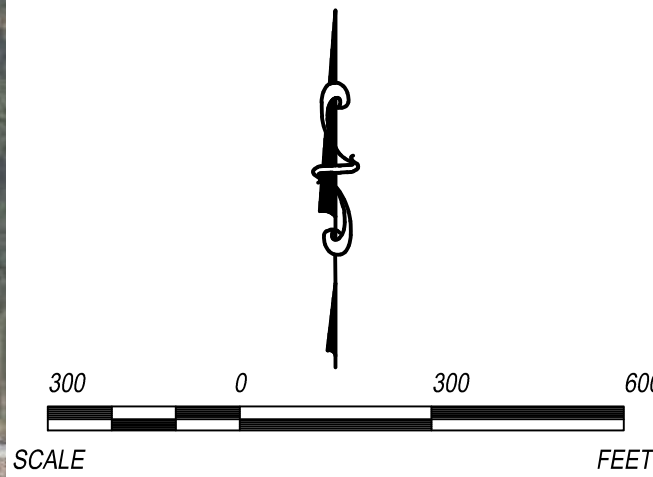
UW-11	
Constituent (units)	Concentration
Barium (mg/L)	0.0165 - 0.0216 (2/2)
Cobalt (mg/L)	0.000618 (1/2)
Nickel (mg/L)	0.00511 (1/2)
Total Suspended Solids (mg/L)	7.38 - 26.5 (2/2)

PZ-14	
Constituent (units)	Concentration
Barium (mg/L)	0.0252 - 0.0435 (2/2)
Cobalt (mg/L)	0.005 - 0.0062 (2/2)
Lead (mg/L)	0.000581 (1/2)
Nickel (mg/L)	0.00647 - 0.0067 (2/2)
Zinc (mg/L)	0.0288 - 0.0313 (2/2)
Total Suspended Solids (mg/L)	60 - 93 (2/2)

DW-19	
Constituent (units)	Concentration
Barium (mg/L)	0.0218 - 0.0255 (3/3)
Cadmium (mg/L)	0.000246 (1/3)
Total Suspended Solids (mg/L)	9.25 - 12.9 (2/3)

DW-15	
Constituent (units)	Concentration
Arsenic (mg/L)	0.005 (1/1)
Barium (mg/L)	0.212 (1/1)
Cadmium (mg/L)	0.000235 (1/1)
Cobalt (mg/L)	0.0185 (1/1)
Lead (mg/L)	0.000902 (1/1)

Constituent	Monitoring Point	Maximum Concentration
Arsenic (mg/L)	DW-15	0.005
Barium (mg/L)	DW-15	0.212
Beryllium (mg/L)	DW-24	0.00774
Cadmium (mg/L)	DW-24	0.0122
Cobalt (mg/L)	DW-23	1.13
Copper (mg/L)	DW-24	0.0108
Lead (mg/L)	DW-8	0.0037
Nickel (mg/L)	DW-23	1.33
Selenium (mg/L)	DW-24	0.00626
Silver (mg/L)	DW-23	0.00413
Zinc (mg/L)	DW-23	0.868
Total Suspended Solids (mg/L)	PZ-14	93
1,1-Dichloroethane (ug/L)	DW-8	2.43
1,4-Dichlorobenzene (ug/L)	UW-10	7.86
Benzene (ug/L)	UW-10	2.44
cis-1,2-Dichloroethene (ug/L)	DW-8	2.49
Vinyl Chloride (ug/L)	UW-10	1.01



CK BY		REV	DATE	
<b>REPORTING PERIOD DETECTION SUMMARY</b>				
SHEET TITLE		PROJECT TITLE		
MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION		BINNS AND STEVENS SITE		
2979 US HIGHWAY 63		2024 ANNUAL WATER QUALITY REPORT		
CLIENT				
MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION				
2979 US HIGHWAY 63				
OSKALOOSA, IA				
CADD FILE:				
MAHASKA 2024 AWQR V0.0.DWG				
DATE: 2/27/25				
DRAWING NO.				
<b>3</b>				

**Appendix A**  
**Field Sampling Forms**

## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>DW-8</b>	Date: <b>5/14/2024</b>
Gradient: <b>Down</b>	Sampler: <b>Konner Roth</b>

### A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped? <b>Yes</b>	
Litter/Standing Water? <b>No</b>	

### B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	28.3
Initial Static Water Level (feet):	19.61
Initial Groundwater Elevation (ft-amsl):	727.82
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)	
2:25 PM	Purging start time.						
2:28 PM	15.4	0.9	2157.9	6.18	12.7	2.9	
2:31 PM	15.4	0.1	2126.7	6.20	8.5	2.5	
2:34 PM	15.9	<0.1	2072.3	6.22	5.6	4.4	
2:37 PM	16.4	<0.1	2024.1	6.23	3.1	5.9	
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

### D. WELL MAINTENANCE

Does the well require any future maintenance? <b>No</b>	
If yes, explain:	
Additional Comments:	Color-Clear Odor-None

**FORM FOR GROUNDWATER SAMPLING**

Project:	<b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>		
Monitoring Well/Piezometer ID:	<b>DW-15</b>	Date:	<b>5/14/2024</b>
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):	34.2
Initial Static Water Level (feet):	29.55
Initial Groundwater Elevation (ft-amsl):	710.35
Equipment Used:	Dedicated Submersible 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)	
1:40 PM	Purging start time.						
1:43 PM	12.7	0.7	539.9	6.46	-22.4	159.4	
1:46 PM	13.2	0.2	543.6	6.34	-22.8	107.5	
1:49 PM	13.1	<0.1	549.2	6.29	-24.6	62.4	
1:52 PM	13.6	<0.1	551.6	6.26	-27.3	63.2	
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	2.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	183.33

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

Additional Comments:	Color-Brown/cloudy Odor-Sulfur Appendix I metals, alkalinity, and sulfide sample bottles filled before well went dry.
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### FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>DW-19</b>	Date: <b>5/14/2024</b>
Gradient: <b>Up</b>	Sampler: <b>Konner Roth</b>

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

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	27.4
Initial Static Water Level (feet):	14.85
Initial Groundwater Elevation (ft-amsl):	725.26
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING
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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)	
12:56 PM	Purging start time.						
12:59 PM	15.2	3.6	1903.1	6.10	283.1	2.8	
1:02 PM	14.9	3.2	1901.1	6.19	279.4	3.9	
1:05 PM	15.0	3.1	1900.5	6.21	277.8	7.2	
1:08 PM	15.3	3.0	1902.8	6.21	276.8	10.2	
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

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

Additional Comments:	Color-Clear Odor-None
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**FORM FOR GROUNDWATER SAMPLING**

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>DW-23</b>	Date: <b>5/14/2024</b>
Gradient: <b>Down</b>	Sampler: <b>Konner Roth</b>

<b>A. MW/PIEZOMETER CONDITIONS</b>	
Well/Piezometer Capped? <b>Yes</b>	
Litter/Standing Water? <b>Yes</b>	Litter surrounding area.

<b>B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)</b>	
Measured Well Total Depth (feet):	25.0
Initial Static Water Level (feet):	18.04
Initial Groundwater Elevation (ft-amsl):	707.97
Equipment Used:	Dedicated Tubing – Peristaltic Pump

<b>C. WELL PURGING</b>							
<b>FIELD PARAMETERS</b> [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)	
4:33 PM	Purging start time.						
4:36 PM	16.4	0.9	5945.6	4.93	122.8	6.2	
4:39 PM	15.9	0.5	5960.0	4.88	126.6	5.8	
4:42 PM	15.6	0.4	5921.1	4.64	152.4	7.9	
4:45 PM	15.6	0.5	5809.6	4.44	179.3	6.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.6
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	133.33

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

Additional Comments:	Color-Clear Odor-None
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## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>			
Monitoring Well/Piezometer ID: <b>PZ-14</b>		Date: <b>5/14/2024</b>	
Gradient: <b>Down</b>		Sampler: <b>Konner Roth</b>	

A. MW/PIEZOMETER CONDITIONS	
Well/Piezometer Capped? <b>Yes</b>	
Litter/Standing Water? <b>Yes</b>	Litter surrounding area.

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	16.9
Initial Static Water Level (feet):	9.50
Initial Groundwater Elevation (ft-amsl):	705.58
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)	
6:06 PM	Purging start time.						
6:09 PM	14.8	1.5	4782.2	6.62	-67.2	23.6	
6:12 PM	14.9	0.4	4812.6	6.71	-86.3	45.0	
6:15 PM	15.0	0.2	4797.6	6.75	-96.2	66.9	
6:18 PM	14.9	0.1	4776.0	6.74	-99.7	60.3	
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? <b>No</b>	
If yes, explain:	
Additional Comments:	Color-Yellow Odor-Metallic



## FORM FOR GROUNDWATER SAMPLING

Project:	<b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>		
Monitoring Well/Piezometer ID:	<b>UW-9R</b>	Date:	<b>5/14/2024</b>
Gradient:	Down	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):	40.0
Initial Static Water Level (feet):	39.96
Initial Groundwater Elevation (ft-amsl):	736.99
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING	
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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)
	Purging start time.					
	Parameters stabilized, sample collected.					

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

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

Additional Comments:	No sample - insufficient water.
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## FORM FOR GROUNDWATER SAMPLING

<b>Project: Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>			
Monitoring Well/Piezometer ID: <b>UW-9RA</b>		Date: <b>5/14/2024</b>	
Gradient: <b>Down</b>	Sampler: <b>Konner Roth</b>		

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

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	42.6
Initial Static Water Level (feet):	42.29
Initial Groundwater Elevation (ft-amsl):	733.81
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)
	Purging start time.					
	Parameters stabilized, sample collected.					

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

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

Additional Comments:	No sample - insufficient water.
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## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>UW-10</b>	Date: <b>5/14/2024</b>
Gradient: <b>Down</b>	Sampler: <b>Konner Roth</b>

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

<b>B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)</b>	
Measured Well Total Depth (feet):	25.3
Initial Static Water Level (feet):	13.62
Initial Groundwater Elevation (ft-amsl):	747.32
Equipment Used:	Dedicated Tubing – Peristaltic Pump

<b>C. WELL PURGING</b>
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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)	
3:43 PM	Purging start time.						
3:46 PM	14.2	0.4	2450.5	6.02	11.1	3.6	
3:49 PM	14.6	0.1	2451.8	6.01	12.5	3.4	
3:52 PM	14.5	<0.1	2454.3	6.00	11.3	3.6	
3:55 PM	14.3	<0.1	2452.9	5.99	10.2	3.5	
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

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

Additional Comments:	Color-Clear Odor-Sulfur
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## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>UW-11</b>	Date: <b>5/14/2024</b>
Gradient: <b>Up</b>	Sampler: <b>Konner Roth</b>

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):	39.1
Initial Static Water Level (feet):	18.90
Initial Groundwater Elevation (ft-amsl):	725.45
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)
5:24 PM	Purging start time.					
5:27 PM	14.3	0.6	3763.1	6.08	37.0	7.9
5:30 PM	14.4	0.1	3631.9	6.11	19.9	3.5
5:33 PM	14.5	<0.1	3576.8	6.11	12.6	3.4
5:36 PM	14.5	<0.1	3546.2	6.12	8.5	31.1
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? <span style="float: right;">No</span>	
If yes, explain:	

Additional Comments:	Color-Clear Odor-None
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### FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>UW-21</b>	Date: <b>5/14/2024</b>
Gradient: <b>Up</b>	Sampler: <b>Konner Roth</b>

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

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	40.1
Initial Static Water Level (feet):	36.54
Initial Groundwater Elevation (ft-amsl):	720.25
Equipment Used:	Dedicated Submersible 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)	
	Purging start time.						
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

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

Additional Comments:	No sample - insufficient water.
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**FORM FOR SURFACE WATER SAMPLING**

2nd 2021 Semi-Annual Sampling

Site Name Mahaska County Landfill (Binns & Stevens) Permit No. 62-SDP-01-74P  
Surface Monitoring Point No. GU-1 Date 5-14-24

Name of Person Sampling Konner Roth

**A. TYPE OF MOINITORING POINT**

Stream \_\_\_\_\_ Open Tile \_\_\_\_\_  
Road Ditch \_\_\_\_\_ Tile with Riser \_\_\_\_\_  
Drainage Ditch \_\_\_\_\_ Other X

**B. PURPOSE OF MONITORING POINT**

Upstream \_\_\_\_\_ Downstream \_\_\_\_\_  
Within Landfill X Other \_\_\_\_\_

**C. MONITORING POINT CONDITIONS/LOCATION**

Lagoon Underdrain  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Was monitoring point dry? yes Too little water to sample? yes  
Was water flowing? NO If yes, estimate quantity (gpm) \_\_\_\_\_  
Standing Water? NO If yes, estimate depth (inches) \_\_\_\_\_  
If yes, estimate width (inches) \_\_\_\_\_  
Was water discolored? N/A  
Does water have odor? N/A  
Was ground discolored? N/A  
Litter present? yes

**D. FIELD MEASUREMENTS**

Weather Conditions: 72° F, Sunny, 5-10 mph wind

Time: 10:00 am

Field Measurements:

Temperature	_____	Units	<u>Celsius</u>
Equipment Used	_____		
pH	_____	Units	<u>Standard units</u>
Equipment Used	_____		
Spec. Conductance	_____	Units	<u>uS/cm</u>
Equipment Used	_____		

COMMENTS Not enough water  
\_\_\_\_\_  
\_\_\_\_\_



## FORM FOR GROUNDWATER SAMPLING

<b>Project:</b> Mahaska County Sanitary Landfill - Binns & Stevens			
<b>Monitoring Well/Piezometer ID:</b> DW-15		<b>Date:</b> 11/20/2024	
<b>Gradient:</b> Up	<b>Sampler:</b> Cole Tesar		

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):	30.5
Initial Static Water Level (feet):	Dry
Initial Groundwater Elevation (ft-amsl):	NA
Equipment Used:	Dedicated Submersible

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)	
	Purging start time.						
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

D. WELL MAINTENANCE	
Does the well require any future maintenance? No	
If yes, explain:	
Additional Comments:	No sample - insufficient water.



**FORM FOR GROUNDWATER SAMPLING**

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>DW-19</b>	Date: <b>11/18/2024</b>
Gradient: <b>Up</b>	Sampler: <b>Cole Tesar</b>

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

<b>B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)</b>	
Measured Well Total Depth (feet):	27.4
Initial Static Water Level (feet):	16.80
Initial Groundwater Elevation (ft-amsl):	723.31
Equipment Used:	Dedicated Tubing – Peristaltic Pump

<b>C. WELL PURGING</b>							
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)	
2:57 PM	Purging start time.						
3:00 PM	14.5	2.4	2079.2	6.34	257.7	13.9	
3:03 PM	14.5	2.1	2074.7	6.34	263.2	10.1	
3:06 PM	14.7	2.0	2068.9	6.35	266.8	9.2	
3:09 PM	14.8	2.0	2063.6	6.35	269.4	8.0	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	183.33

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

Additional Comments:	Color-Clear Odor-None
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**FORM FOR GROUNDWATER SAMPLING**

<b>Project:</b>	<b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>		
<b>Monitoring Well/Piezometer ID:</b>	<b>DW-23</b>	<b>Date:</b>	<b>11/20/2024</b>
<b>Gradient:</b>	Down	<b>Sampler:</b>	Cole Tesar

**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):	25.0
Initial Static Water Level (feet):	17.90
Initial Groundwater Elevation (ft-amsl):	708.11
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)
1:04 PM	Purging start time.					
1:07 PM	12.2	0.3	6147.8	5.06	66.5	4.4
1:10 PM	12.1	0.1	6125.2	4.69	103.8	3.4
1:13 PM	11.9	0.1	6087.9	4.45	136.8	2.0
1:16 PM	11.9	0.1	6031.4	4.37	156.4	1.8
	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-None
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## FORM FOR GROUNDWATER SAMPLING

Project:	Mahaska County Sanitary Landfill - Binns & Stevens		
Monitoring Well/Piezometer ID:	DW-24	Date:	11/18/2024
Gradient:	Down	Sampler:	Cole Tesar

### 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):	14.5
Initial Static Water Level (feet):	10.65
Initial Groundwater Elevation (ft-amsl):	706.83
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)	
1:39 PM	Purging start time.						
1:42 PM	14.1	0.8	2490.4	3.44	316.6	12.2	
1:45 PM	14.2	0.4	2487.7	3.43	329.4	20.1	
1:48 PM	14.2	0.2	2491.2	3.44	334.2	2.5	
1:51 PM	14.2	0.2	2497.8	3.44	335.9	2.9	
	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

<b>Project: Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>			
Monitoring Well/Piezometer ID:	<b>PZ-14</b>	Date:	<b>11/20/2024</b>
Gradient:	Down	Sampler:	Cole Tesar

A. MW/PIEZOMETER CONDITIONS	
Well/Piezometer Capped?	Yes
Litter/Standing Water?	Yes
Litter and standing water around well	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	16.1
Initial Static Water Level (feet):	8.90
Initial Groundwater Elevation (ft-amsl):	706.18
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)	
11:48 AM	Purging start time.						
11:51 AM	12.1	1.0	2905.9	6.80	-92.8	86.7	
11:54 AM	12.2	0.5	2949.1	6.71	-98.0	143.0	
11:57 AM	12.2	0.3	3010.1	6.65	-99.1	165.1	
12:00 PM	11.9	0.3	3156.1	6.49	-94.9	176.9	
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	2.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	183.33

D. WELL MAINTENANCE	
Does the well require any future maintenance?	No

If yes, explain:	
------------------	--

Additional Comments:	Color-Orange Odor-Sulfur
----------------------	--------------------------

### FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>			
Monitoring Well/Piezometer ID:	<b>UW-9R</b>	Date:	<b>11/20/2024</b>
Gradient:	Down	Sampler:	Cole Tesar

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):	39.6
Initial Static Water Level (feet):	Dry
Initial Groundwater Elevation (ft-amsl):	NA
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)	
Purging start time.							
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

D. WELL MAINTENANCE	
Does the well require any future maintenance?	No
If yes, explain:	
Additional Comments:	No sample - insufficient water.

## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>			
Monitoring Well/Piezometer ID: <b>UW-9RA</b>		Date: <b>11/20/2024</b>	
Gradient: <b>Down</b>		Sampler: <b>Cole Tesar</b>	

### 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):	42.5
Initial Static Water Level (feet):	42.35
Initial Groundwater Elevation (ft-amsl):	733.75
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)	
	Purging start time.						
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

### D. WELL MAINTENANCE

Does the well require any future maintenance?		No
If yes, explain:		

Additional Comments:	No sample - insufficient water.
----------------------	---------------------------------

### FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>UW-10</b>	Date: <b>11/20/2024</b>
Gradient: <b>Down</b>	Sampler: <b>Cole Tesar</b>

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

<b>B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)</b>	
Measured Well Total Depth (feet):	25.3
Initial Static Water Level (feet):	14.50
Initial Groundwater Elevation (ft-amsl):	746.44
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)	
11:02 AM	Purging start time.						
11:05 AM	13.0	0.8	2488.4	6.10	-0.9	2.2	
11:08 AM	12.9	0.3	2491.6	6.09	-11.4	2.4	
11:11 AM	13.1	0.1	2498.6	6.09	-17.0	2.2	
11:14 AM	13.1	0.1	2508.0	6.08	-20.5	2.4	
Parameters stabilized, sample collected.							

Quantity of Water Removed from Well (liters):	2.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	183.33

<b>D. WELL MAINTENANCE</b>	
Does the well require any future maintenance?	No
If yes, explain:	
Additional Comments:	Color-Clear Odor-Sulfur

## FORM FOR GROUNDWATER SAMPLING

Project: <b>Mahaska County Sanitary Landfill - Binns &amp; Stevens</b>	
Monitoring Well/Piezometer ID: <b>UW-11</b>	Date: <b>11/20/2024</b>
Gradient: <b>Up</b>	Sampler: <b>Cole Tesar</b>

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

<b>B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)</b>	
Measured Well Total Depth (feet):	31.0
Initial Static Water Level (feet):	18.21
Initial Groundwater Elevation (ft-amsl):	726.14
Equipment Used:	Dedicated Tubing – Peristaltic Pump

<b>C. WELL PURGING</b>
------------------------

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)	
12:23 PM	Purging start time.						
12:26 PM	13.0	0.8	3730.6	6.28	-13.7	2.4	
12:29 PM	13.2	0.3	3733.1	6.28	-26.1	2.3	
12:32 PM	13.1	0.1	3744.2	6.28	-32.4	2.4	
12:35 PM	13.6	0.1	3752.0	6.27	-36.7	2.6	
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

<b>D. WELL MAINTENANCE</b>	
Does the well require any future maintenance?	No
If yes, explain:	
Additional Comments:	Color-Clear Odor-None





FORM FOR SURFACE WATER SAMPLING

2nd 2021 Semi-Annual Sampling

Site Name Mahaska County Landfill (Binns & Stevens) Permit No. 62-SDP-01-74P
Surface Monitoring Point No. GU-1 Date 11/20/24

Name of Person Sampling Cole Tesar

A. TYPE OF MOINITORING POINT

Stream, Road Ditch, Drainage Ditch, Open Tile, Tile with Riser, Other X

B. PURPOSE OF MONITORING POINT

Upstream, Downstream, Within Landfill X, Other

C. MONITORING POINT CONDITIONS/LOCATION

Lagoon Underdrain

Was monitoring point dry? Yes, Too little water to sample?
Was water flowing? No, If yes, estimate quantity (gpm)
Standing Water? No, If yes, estimate depth (inches)
If yes, estimate width (inches)
Was water discolored? -
Does water have odor? -
Was ground discolored? -
Litter present? Yes

D. FIELD MEASUREMENTS

Weather Conditions: 36°F, Cloudy/snow, 8-24 mph E wind

Time:

Field Measurements:

Temperature, Equipment Used, Units Celsius
pH, Equipment Used, Units Standard units
Spec. Conductance, Equipment Used, Units uS/cm

COMMENTS

Dry

**Appendix B-1**  
**Laboratory Analytical Data Sheets**

# ANALYTICAL REPORT

## PREPARED FOR

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

Generated 5/28/2024 10:58:57 PM

## JOB DESCRIPTION

Mahaska Co SLF Binns and Stevens 1st 2024 HMSP

## JOB NUMBER

310-281485-1

# Eurofins Cedar Falls

## 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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Authorized for release by  
Mary Yang, Project Management Assistant I  
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# Case Narrative

Client: SCS Engineers  
Project: Mahaska Co SLF Binns and Stevens 1st 2024 HMSP

Job ID: 310-281485-1

**Job ID: 310-281485-1**

**Eurofins Cedar Falls**

## Job Narrative 310-281485-1

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 are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample 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 5/16/2024 4:15 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.5°C and 3.9°C.

### GC/MS VOA

Method 8260D: The continuing calibration verification (CCV) associated with batch 310-422323 recovered above the upper control limit for cis-1,3-Dichloropropene (22.5%D) and 4-Methyl-2-pentanone (MIBK) (22.7%D). The LCS associated with this CCV passes CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-422323/3).

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

### HPLC/IC

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.

Eurofins Cedar Falls

# Sample Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-281485-1	DW-8	Water	05/14/24 14:51	05/16/24 16:15
310-281485-2	UW-10	Water	05/14/24 16:11	05/16/24 16:15
310-281485-3	UW-11	Water	05/14/24 17:50	05/16/24 16:15
310-281485-4	PZ-14	Water	05/14/24 18:31	05/16/24 16:15
310-281485-5	DW-19	Water	05/14/24 13:22	05/16/24 16:15
310-281485-6	DW-23	Water	05/14/24 17:05	05/16/24 16:15
310-281485-7	DW-24	Water	05/14/24 12:18	05/16/24 16:15
310-281485-8	MW-D	Water	05/14/24 12:18	05/16/24 16:15
310-281485-9	Trip Blank	Water	05/14/24 00:00	05/16/24 16:15
310-281485-10	DW-15	Water	05/14/24 14:00	05/16/24 16:15



## Detection Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

### Client Sample ID: DW-8

### Lab Sample ID: 310-281485-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	2.43		1.00	0.220	ug/L	1		8260D	Total/NA
Benzene	0.254	J	0.500	0.220	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	2.49		1.00	0.210	ug/L	1		8260D	Total/NA
Sulfate	594		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	0.0570		0.0500	0.0210	mg/L	1		6020B	Total/NA
Arsenic	0.000941	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0546		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cobalt	0.00920		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.00489	J	0.00500	0.00210	mg/L	1		6020B	Total/NA
Zinc	0.0122	J	0.0200	0.00970	mg/L	1		6020B	Total/NA
Iron	15.9		0.100	0.0360	mg/L	1		6020B	Total/NA
Total Suspended Solids	34.5		7.50	5.55	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	596		5.00	2.50	mg/L	1		SM 2320B	Total/NA

### Client Sample ID: UW-10

### Lab Sample ID: 310-281485-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	0.220	J	1.00	0.220	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	7.86		1.00	0.230	ug/L	1		8260D	Total/NA
Acetone	3.28	J	10.0	3.10	ug/L	1		8260D	Total/NA
Benzene	2.44		0.500	0.220	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.632	J	1.00	0.210	ug/L	1		8260D	Total/NA
Vinyl chloride	1.01		1.00	0.180	ug/L	1		8260D	Total/NA
Sulfate	1020		100	42.0	mg/L	100		9056A	Total/NA
Arsenic	0.00425		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0174		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cadmium	0.000196	J	0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.0827		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.00436	J	0.00500	0.00210	mg/L	1		6020B	Total/NA
Iron	52.6		0.100	0.0360	mg/L	1		6020B	Total/NA
Total Suspended Solids	30.0		7.50	5.55	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	705		5.00	2.50	mg/L	1		SM 2320B	Total/NA

### Client Sample ID: UW-11

### Lab Sample ID: 310-281485-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	2150		100	42.0	mg/L	100		9056A	Total/NA
Arsenic	0.000724	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0165		0.00200	0.000660	mg/L	1		6020B	Total/NA
Iron	33.2		0.100	0.0360	mg/L	1		6020B	Total/NA
Total Suspended Solids	26.5		7.50	5.55	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	531		5.00	2.50	mg/L	1		SM 2320B	Total/NA

### Client Sample ID: PZ-14

### Lab Sample ID: 310-281485-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1550		100	42.0	mg/L	100		9056A	Total/NA
Arsenic	0.000586	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0252		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cobalt	0.00500		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.00670		0.00500	0.00210	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

## Client Sample ID: PZ-14 (Continued)

Lab Sample ID: 310-281485-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Zinc	0.0288		0.0200	0.00970	mg/L	1		6020B	Total/NA
Iron	169		0.400	0.144	mg/L	4		6020B	Total/NA
Total Suspended Solids	93.0		15.0	11.1	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	55.6		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-19

Lab Sample ID: 310-281485-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	557		100	42.0	mg/L	100		9056A	Total/NA
Barium	0.0218		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cadmium	0.000196	J	0.000200	0.000100	mg/L	1		6020B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	281		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-23

Lab Sample ID: 310-281485-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	4130		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	4.38		0.0500	0.0210	mg/L	1		6020B	Total/NA
Arsenic	0.00139	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0104		0.00200	0.000660	mg/L	1		6020B	Total/NA
Beryllium	0.00176		0.00100	0.000330	mg/L	1		6020B	Total/NA
Cadmium	0.00332		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.833		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00419	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000567		0.000500	0.000260	mg/L	1		6020B	Total/NA
Nickel	1.16		0.00500	0.00210	mg/L	1		6020B	Total/NA
Selenium	0.00540		0.00500	0.00140	mg/L	1		6020B	Total/NA
Zinc	0.585		0.0200	0.00970	mg/L	1		6020B	Total/NA
Iron	76.9		0.100	0.0360	mg/L	1		6020B	Total/NA
Total Suspended Solids	8.60		3.00	2.22	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	39.8		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-24

Lab Sample ID: 310-281485-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1080		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	41.5		0.0500	0.0210	mg/L	1		6020B	Total/NA
Arsenic	0.00138	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.00980		0.00200	0.000660	mg/L	1		6020B	Total/NA
Beryllium	0.00726		0.00100	0.000330	mg/L	1		6020B	Total/NA
Cadmium	0.00870		0.000200	0.000100	mg/L	1		6020B	Total/NA
Chromium	0.00257	J	0.00500	0.00120	mg/L	1		6020B	Total/NA
Cobalt	0.251		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.0108		0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000331	J	0.000500	0.000260	mg/L	1		6020B	Total/NA
Nickel	0.221		0.00500	0.00210	mg/L	1		6020B	Total/NA
Selenium	0.00518		0.00500	0.00140	mg/L	1		6020B	Total/NA
Zinc	0.296		0.0200	0.00970	mg/L	1		6020B	Total/NA
Iron	2.75		0.100	0.0360	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

## Client Sample ID: MW-D

Lab Sample ID: 310-281485-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1100		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	35.1		0.0500	0.0210	mg/L	1		6020B	Total/NA
Arsenic	0.00113	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.00952		0.00200	0.000660	mg/L	1		6020B	Total/NA
Beryllium	0.00684		0.00100	0.000330	mg/L	1		6020B	Total/NA
Cadmium	0.00956		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.250		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00885		0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000286	J	0.000500	0.000260	mg/L	1		6020B	Total/NA
Nickel	0.230		0.00500	0.00210	mg/L	1		6020B	Total/NA
Selenium	0.00463	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Zinc	0.319		0.0200	0.00970	mg/L	1		6020B	Total/NA
Iron	3.98		0.100	0.0360	mg/L	1		6020B	Total/NA

## Client Sample ID: Trip Blank

Lab Sample ID: 310-281485-9

No Detections.

## Client Sample ID: DW-15

Lab Sample ID: 310-281485-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	34.1		5.00	2.10	mg/L	5		9056A	Total/NA
Aluminum	0.507		0.0500	0.0210	mg/L	1		6020B	Total/NA
Arsenic	0.00500		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.212		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cadmium	0.000235		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.0185		0.000500	0.000170	mg/L	1		6020B	Total/NA
Lead	0.000902		0.000500	0.000260	mg/L	1		6020B	Total/NA
Vanadium	0.00157	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Iron	22.5		0.100	0.0360	mg/L	1		6020B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	277		5.00	2.50	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-8**

**Lab Sample ID: 310-281485-1**

Date Collected: 05/14/24 14:51

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 04:49	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 04:49	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 04:49	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 04:49	1
<b>1,1-Dichloroethane</b>	<b>2.43</b>		1.00	0.220	ug/L			05/22/24 04:49	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 04:49	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 04:49	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 04:49	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 04:49	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 04:49	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 04:49	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 04:49	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 04:49	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 04:49	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 04:49	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 04:49	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 04:49	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 04:49	1
<b>Benzene</b>	<b>0.254</b>	<b>J</b>	0.500	0.220	ug/L			05/22/24 04:49	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 04:49	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 04:49	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 04:49	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 04:49	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 04:49	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 04:49	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 04:49	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 04:49	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 04:49	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 04:49	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 04:49	1
<b>cis-1,2-Dichloroethene</b>	<b>2.49</b>		1.00	0.210	ug/L			05/22/24 04:49	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 04:49	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 04:49	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 04:49	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 04:49	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 04:49	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 04:49	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 04:49	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 04:49	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 04:49	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 04:49	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 04:49	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 04:49	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 04:49	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 04:49	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 04:49	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 04:49	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-8**

**Lab Sample ID: 310-281485-1**

**Date Collected: 05/14/24 14:51**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	111		73 - 130		05/22/24 04:49	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 04:49	1
4-Bromofluorobenzene (Surr)	100		80 - 120		05/22/24 04:49	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	594		100	42.0	mg/L			05/23/24 13:42	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.0570		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:05	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:05	1
Arsenic	0.000941	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:05	1
Barium	0.0546		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:05	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:05	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:05	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:05	1
Cobalt	0.00920		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:05	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:05	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:05	1
Nickel	0.00489	J	0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:05	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:05	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:05	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:05	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:05	1
Zinc	0.0122	J	0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:05	1
Iron	15.9		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:05	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	34.5		7.50	5.55	mg/L			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	596		5.00	2.50	mg/L			05/21/24 18:14	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: UW-10**

**Lab Sample ID: 310-281485-2**

Date Collected: 05/14/24 16:11

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 05:12	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 05:12	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 05:12	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 05:12	1
<b>1,1-Dichloroethane</b>	<b>0.220</b>	<b>J</b>	1.00	0.220	ug/L			05/22/24 05:12	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 05:12	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 05:12	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 05:12	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 05:12	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 05:12	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 05:12	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 05:12	1
<b>1,4-Dichlorobenzene</b>	<b>7.86</b>		1.00	0.230	ug/L			05/22/24 05:12	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 05:12	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 05:12	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 05:12	1
<b>Acetone</b>	<b>3.28</b>	<b>J</b>	10.0	3.10	ug/L			05/22/24 05:12	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 05:12	1
<b>Benzene</b>	<b>2.44</b>		0.500	0.220	ug/L			05/22/24 05:12	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 05:12	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 05:12	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 05:12	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 05:12	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 05:12	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 05:12	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 05:12	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 05:12	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 05:12	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 05:12	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 05:12	1
<b>cis-1,2-Dichloroethene</b>	<b>0.632</b>	<b>J</b>	1.00	0.210	ug/L			05/22/24 05:12	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 05:12	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 05:12	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 05:12	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 05:12	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 05:12	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 05:12	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 05:12	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 05:12	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 05:12	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 05:12	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 05:12	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 05:12	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 05:12	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 05:12	1
<b>Vinyl chloride</b>	<b>1.01</b>		1.00	0.180	ug/L			05/22/24 05:12	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 05:12	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: UW-10**

**Lab Sample ID: 310-281485-2**

**Date Collected: 05/14/24 16:11**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	113		73 - 130		05/22/24 05:12	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 05:12	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/22/24 05:12	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1020		100	42.0	mg/L			05/23/24 14:20	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:07	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:07	1
Arsenic	0.00425		0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:07	1
Barium	0.0174		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:07	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:07	1
Cadmium	0.000196	J	0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:07	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:07	1
Cobalt	0.0827		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:07	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:07	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:07	1
Nickel	0.00436	J	0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:07	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:07	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:07	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:07	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:07	1
Zinc	<0.0200		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:07	1
Iron	52.6		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:07	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	30.0		7.50	5.55	mg/L			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	705		5.00	2.50	mg/L			05/21/24 18:25	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: UW-11**

**Lab Sample ID: 310-281485-3**

Date Collected: 05/14/24 17:50

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 11:21	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 11:21	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 11:21	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 11:21	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 11:21	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 11:21	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 11:21	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 11:21	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 11:21	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 11:21	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 11:21	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 11:21	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 11:21	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 11:21	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 11:21	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 11:21	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 11:21	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 11:21	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 11:21	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 11:21	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 11:21	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 11:21	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 11:21	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 11:21	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 11:21	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 11:21	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 11:21	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 11:21	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 11:21	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 11:21	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 11:21	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 11:21	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 11:21	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 11:21	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 11:21	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 11:21	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 11:21	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 11:21	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 11:21	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 11:21	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 11:21	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 11:21	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 11:21	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 11:21	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 11:21	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 11:21	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 11:21	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: UW-11**

**Lab Sample ID: 310-281485-3**

Date Collected: 05/14/24 17:50

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	110		73 - 130		05/22/24 11:21	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 11:21	1
4-Bromofluorobenzene (Surr)	100		80 - 120		05/22/24 11:21	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	2150		100	42.0	mg/L			05/23/24 14:33	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:09	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:09	1
Arsenic	0.000724	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:09	1
Barium	0.0165		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:09	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:09	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:09	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:09	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:09	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:09	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:09	1
Nickel	<0.00500		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:09	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:09	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:09	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:09	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:09	1
Zinc	<0.0200		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:09	1
Iron	33.2		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:09	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	26.5		7.50	5.55	mg/L			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	531		5.00	2.50	mg/L			05/21/24 18:49	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: PZ-14**

**Lab Sample ID: 310-281485-4**

Date Collected: 05/14/24 18:31

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 11:43	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 11:43	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 11:43	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 11:43	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 11:43	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 11:43	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 11:43	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 11:43	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 11:43	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 11:43	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 11:43	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 11:43	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 11:43	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 11:43	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 11:43	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 11:43	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 11:43	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 11:43	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 11:43	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 11:43	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 11:43	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 11:43	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 11:43	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 11:43	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 11:43	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 11:43	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 11:43	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 11:43	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 11:43	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 11:43	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 11:43	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 11:43	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 11:43	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 11:43	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 11:43	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 11:43	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 11:43	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 11:43	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 11:43	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 11:43	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 11:43	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 11:43	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 11:43	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 11:43	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 11:43	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 11:43	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 11:43	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: PZ-14**

**Lab Sample ID: 310-281485-4**

Date Collected: 05/14/24 18:31

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	112		73 - 130		05/22/24 11:43	1
Toluene-d8 (Surr)	96		80 - 120		05/22/24 11:43	1
4-Bromofluorobenzene (Surr)	100		80 - 120		05/22/24 11:43	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1550		100	42.0	mg/L			05/23/24 14:45	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:22	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:22	1
Arsenic	0.000586	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:22	1
Barium	0.0252		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:22	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:22	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:22	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:22	1
Cobalt	0.00500		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:22	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:22	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:22	1
Nickel	0.00670		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:22	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:22	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:22	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:22	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:22	1
Zinc	0.0288		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:22	1
Iron	169		0.400	0.144	mg/L		05/20/24 09:30	05/22/24 13:04	4

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	93.0		15.0	11.1	mg/L			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	55.6		5.00	2.50	mg/L			05/21/24 19:01	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-19**

**Lab Sample ID: 310-281485-5**

Date Collected: 05/14/24 13:22

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 12:06	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 12:06	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 12:06	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 12:06	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 12:06	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 12:06	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 12:06	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 12:06	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 12:06	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 12:06	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 12:06	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 12:06	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 12:06	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 12:06	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 12:06	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 12:06	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 12:06	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 12:06	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 12:06	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 12:06	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 12:06	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 12:06	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 12:06	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 12:06	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 12:06	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 12:06	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 12:06	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 12:06	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 12:06	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 12:06	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 12:06	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 12:06	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 12:06	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 12:06	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 12:06	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 12:06	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 12:06	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 12:06	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 12:06	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 12:06	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 12:06	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 12:06	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 12:06	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 12:06	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 12:06	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 12:06	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 12:06	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-19**

**Lab Sample ID: 310-281485-5**

Date Collected: 05/14/24 13:22

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	112		73 - 130		05/22/24 12:06	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 12:06	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/22/24 12:06	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	557		100	42.0	mg/L			05/23/24 14:58	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:25	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:25	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:25	1
Barium	0.0218		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:25	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:25	1
Cadmium	0.000196	J	0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:25	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:25	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:25	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:25	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:25	1
Nickel	<0.00500		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:25	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:25	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:25	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:25	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:25	1
Zinc	<0.0200		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:25	1
Iron	<0.100		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:25	1

**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			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	281		5.00	2.50	mg/L			05/21/24 19:08	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-23**

**Lab Sample ID: 310-281485-6**

**Date Collected: 05/14/24 17:05**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 12:29	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 12:29	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 12:29	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 12:29	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 12:29	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 12:29	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 12:29	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 12:29	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 12:29	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 12:29	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 12:29	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 12:29	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 12:29	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 12:29	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 12:29	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 12:29	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 12:29	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 12:29	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 12:29	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 12:29	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 12:29	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 12:29	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 12:29	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 12:29	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 12:29	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 12:29	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 12:29	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 12:29	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 12:29	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 12:29	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 12:29	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 12:29	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 12:29	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 12:29	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 12:29	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 12:29	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 12:29	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 12:29	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 12:29	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 12:29	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 12:29	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 12:29	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 12:29	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 12:29	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 12:29	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 12:29	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 12:29	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-23**

**Lab Sample ID: 310-281485-6**

Date Collected: 05/14/24 17:05

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	115		73 - 130		05/22/24 12:29	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 12:29	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/22/24 12:29	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	4130		100	42.0	mg/L			05/23/24 15:11	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	4.38		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:27	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:27	1
Arsenic	0.00139	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:27	1
Barium	0.0104		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:27	1
Beryllium	0.00176		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:27	1
Cadmium	0.00332		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:27	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:27	1
Cobalt	0.833		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:27	1
Copper	0.00419	J	0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:27	1
Lead	0.000567		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:27	1
Nickel	1.16		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:27	1
Selenium	0.00540		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:27	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:27	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:27	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:27	1
Zinc	0.585		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:27	1
Iron	76.9		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:27	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	8.60		3.00	2.22	mg/L			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	39.8		5.00	2.50	mg/L			05/21/24 19:19	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-24**

**Lab Sample ID: 310-281485-7**

**Date Collected: 05/14/24 12:18**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 12:52	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 12:52	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 12:52	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 12:52	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 12:52	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 12:52	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 12:52	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 12:52	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 12:52	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 12:52	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 12:52	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 12:52	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 12:52	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 12:52	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 12:52	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 12:52	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 12:52	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 12:52	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 12:52	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 12:52	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 12:52	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 12:52	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 12:52	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 12:52	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 12:52	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 12:52	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 12:52	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 12:52	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 12:52	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 12:52	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 12:52	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 12:52	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 12:52	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 12:52	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 12:52	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 12:52	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 12:52	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 12:52	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 12:52	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 12:52	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 12:52	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 12:52	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 12:52	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 12:52	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 12:52	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 12:52	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 12:52	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-24**

**Lab Sample ID: 310-281485-7**

Date Collected: 05/14/24 12:18

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	112		73 - 130		05/22/24 12:52	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 12:52	1
4-Bromofluorobenzene (Surr)	99		80 - 120		05/22/24 12:52	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1080		100	42.0	mg/L			05/23/24 15:23	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	41.5		0.0500	0.0210	mg/L		05/20/24 09:30	05/22/24 13:15	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:29	1
Arsenic	0.00138	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:29	1
Barium	0.00980		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:29	1
Beryllium	0.00726		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:29	1
Cadmium	0.00870		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:29	1
Chromium	0.00257	J	0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:29	1
Cobalt	0.251		0.000500	0.000170	mg/L		05/20/24 09:30	05/22/24 13:15	1
Copper	0.0108		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:29	1
Lead	0.000331	J	0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:29	1
Nickel	0.221		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:29	1
Selenium	0.00518		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:29	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:29	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:29	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/22/24 13:15	1
Zinc	0.296		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:29	1
Iron	2.75		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:29	1

**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			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	<5.00		5.00	2.50	mg/L			05/21/24 19:26	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: MW-D**

**Lab Sample ID: 310-281485-8**

**Date Collected: 05/14/24 12:18**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 13:14	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 13:14	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 13:14	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 13:14	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 13:14	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 13:14	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 13:14	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 13:14	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 13:14	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 13:14	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 13:14	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 13:14	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 13:14	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 13:14	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 13:14	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 13:14	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 13:14	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 13:14	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 13:14	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 13:14	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 13:14	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 13:14	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 13:14	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 13:14	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 13:14	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 13:14	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 13:14	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 13:14	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 13:14	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 13:14	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 13:14	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 13:14	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 13:14	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 13:14	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 13:14	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 13:14	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 13:14	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 13:14	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 13:14	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 13:14	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 13:14	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 13:14	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 13:14	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 13:14	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 13:14	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 13:14	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 13:14	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: MW-D**

**Lab Sample ID: 310-281485-8**

Date Collected: 05/14/24 12:18

Matrix: Water

Date Received: 05/16/24 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	112		73 - 130		05/22/24 13:14	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 13:14	1
4-Bromofluorobenzene (Surr)	101		80 - 120		05/22/24 13:14	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1100		100	42.0	mg/L			05/23/24 15:36	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	35.1		0.0500	0.0210	mg/L		05/20/24 09:30	05/22/24 13:17	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:31	1
Arsenic	0.00113	J	0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:31	1
Barium	0.00952		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:31	1
Beryllium	0.00684		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:31	1
Cadmium	0.00956		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:31	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:31	1
Cobalt	0.250		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:31	1
Copper	0.00885		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:31	1
Lead	0.000286	J	0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:31	1
Nickel	0.230		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:31	1
Selenium	0.00463	J	0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:31	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:31	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:31	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:31	1
Zinc	0.319		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:31	1
Iron	3.98		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:31	1

**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			05/20/24 10:17	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	<5.00		5.00	2.50	mg/L			05/21/24 19:29	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 310-281485-9**

Date Collected: 05/14/24 00:00

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 10:35	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 10:35	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 10:35	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 10:35	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 10:35	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 10:35	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 10:35	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 10:35	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 10:35	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 10:35	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 10:35	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 10:35	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 10:35	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 10:35	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 10:35	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 10:35	1
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 10:35	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 10:35	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 10:35	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 10:35	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 10:35	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 10:35	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 10:35	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 10:35	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 10:35	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 10:35	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 10:35	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 10:35	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 10:35	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 10:35	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 10:35	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 10:35	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 10:35	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 10:35	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 10:35	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 10:35	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 10:35	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 10:35	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 10:35	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 10:35	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 10:35	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 10:35	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 10:35	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 10:35	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 10:35	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 10:35	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 10:35	1

# Client Sample Results

Client: SCS Engineers  
Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
HMSP

Job ID: 310-281485-1

**Client Sample ID: Trip Blank**

**Lab Sample ID: 310-281485-9**

**Date Collected: 05/14/24 00:00**

**Matrix: Water**

**Date Received: 05/16/24 16:15**

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Dibromofluoromethane (Surr)</i>	111		73 - 130		05/22/24 10:35	1
<i>Toluene-d8 (Surr)</i>	98		80 - 120		05/22/24 10:35	1
<i>4-Bromofluorobenzene (Surr)</i>	99		80 - 120		05/22/24 10:35	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: DW-15**

**Lab Sample ID: 310-281485-10**

Date Collected: 05/14/24 14:00

Matrix: Water

Date Received: 05/16/24 16:15

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	34.1		5.00	2.10	mg/L			05/23/24 15:19	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.507		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 16:33	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 16:33	1
Arsenic	0.00500		0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 16:33	1
Barium	0.212		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 16:33	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 16:33	1
Cadmium	0.000235		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 16:33	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 16:33	1
Cobalt	0.0185		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 16:33	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 16:33	1
Lead	0.000902		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 16:33	1
Nickel	<0.00500		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 16:33	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 16:33	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 16:33	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 16:33	1
Vanadium	0.00157 J		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 16:33	1
Zinc	<0.0200		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 16:33	1
Iron	22.5		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 16:33	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	277		5.00	2.50	mg/L			05/21/24 19:40	1

# Definitions/Glossary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

## Qualifiers

### GC/MS VOA

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

# Surrogate Summary

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		DBFM (73-130)	TOL (80-120)	BFB (80-120)
310-281485-1	DW-8	111	97	100
310-281485-2	UW-10	113	97	101
310-281485-3	UW-11	110	97	100
310-281485-4	PZ-14	112	96	100
310-281485-4 MS	PZ-14	98	100	101
310-281485-4 MSD	PZ-14	100	101	100
310-281485-5	DW-19	112	97	99
310-281485-6	DW-23	115	97	101
310-281485-7	DW-24	112	97	99
310-281485-8	MW-D	112	97	101
310-281485-9	Trip Blank	111	98	99
LCS 310-422323/6	Lab Control Sample	99	101	99
LCS 310-422323/7	Lab Control Sample	115	97	99
LCS 310-422325/6	Lab Control Sample	99	101	100
LCS 310-422325/7	Lab Control Sample	110	98	100
MB 310-422323/5	Method Blank	112	97	100
MB 310-422325/5	Method Blank	111	97	100

### Surrogate Legend

DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)

BFB = 4-Bromofluorobenzene (Surr)



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-422323/5

Matrix: Water

Analysis Batch: 422323

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/21/24 22:22	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/21/24 22:22	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/21/24 22:22	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/21/24 22:22	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/21/24 22:22	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/21/24 22:22	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/21/24 22:22	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/21/24 22:22	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/21/24 22:22	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/21/24 22:22	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/21/24 22:22	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/21/24 22:22	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/21/24 22:22	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/21/24 22:22	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/21/24 22:22	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/21/24 22:22	1
Acetone	<10.0		10.0	3.10	ug/L			05/21/24 22:22	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/21/24 22:22	1
Benzene	<0.500	0.500	0.500	0.220	ug/L			05/21/24 22:22	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/21/24 22:22	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/21/24 22:22	1
Bromoform	<5.00		5.00	0.780	ug/L			05/21/24 22:22	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/21/24 22:22	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/21/24 22:22	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/21/24 22:22	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/21/24 22:22	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/21/24 22:22	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/21/24 22:22	1
Chloroform	<3.00		3.00	1.30	ug/L			05/21/24 22:22	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/21/24 22:22	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/21/24 22:22	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/21/24 22:22	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/21/24 22:22	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/21/24 22:22	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/21/24 22:22	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/21/24 22:22	1
Styrene	<1.00		1.00	0.370	ug/L			05/21/24 22:22	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/21/24 22:22	1
Toluene	<1.00		1.00	0.430	ug/L			05/21/24 22:22	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/21/24 22:22	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/21/24 22:22	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/21/24 22:22	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/21/24 22:22	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/21/24 22:22	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/21/24 22:22	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/21/24 22:22	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/21/24 22:22	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 310-422323/5

Matrix: Water

Analysis Batch: 422323

Client Sample ID: Method Blank

Prep Type: Total/NA

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Dibromofluoromethane (Surr)	112		73 - 130		05/21/24 22:22	1
Toluene-d8 (Surr)	97		80 - 120		05/21/24 22:22	1
4-Bromofluorobenzene (Surr)	100		80 - 120		05/21/24 22:22	1

Lab Sample ID: LCS 310-422323/6

Matrix: Water

Analysis Batch: 422323

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,1-Trichloroethane	20.0	21.61		ug/L		108	73 - 129
1,1,1,2,2-Tetrachloroethane	20.0	21.40		ug/L		107	68 - 124
1,1,1,2-Trichloroethane	20.0	22.68		ug/L		113	73 - 123
1,1-Dichloroethane	20.0	21.11		ug/L		106	70 - 127
1,1-Dichloroethane	20.0	20.84		ug/L		104	63 - 132
1,2,3-Trichloropropane	20.0	22.31		ug/L		112	65 - 127
1,2-Dibromo-3-chloropropane	20.0	20.77		ug/L		104	50 - 150
1,2-Dibromoethane (EDB)	20.0	22.69		ug/L		113	75 - 125
1,2-Dichlorobenzene	20.0	21.73		ug/L		109	74 - 120
1,2-Dichloroethane	20.0	22.08		ug/L		110	71 - 125
1,2-Dichloropropane	20.0	22.40		ug/L		112	73 - 124
1,4-Dichlorobenzene	20.0	21.56		ug/L		108	72 - 120
2-Butanone (MEK)	40.0	46.88		ug/L		117	50 - 150
2-Hexanone	40.0	46.68		ug/L		117	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	46.42		ug/L		116	60 - 139
Acetone	40.0	46.09		ug/L		115	50 - 150
Acrylonitrile	200	223.7		ug/L		112	50 - 150
Benzene	20.0	21.55		ug/L		108	72 - 124
Bromochloromethane	20.0	21.48		ug/L		107	73 - 130
Bromodichloromethane	20.0	21.39		ug/L		107	74 - 122
Bromoform	20.0	20.87		ug/L		104	61 - 122
Carbon disulfide	20.0	20.61		ug/L		103	59 - 135
Carbon tetrachloride	20.0	22.27		ug/L		111	67 - 132
Chlorobenzene	20.0	21.72		ug/L		109	76 - 120
Chlorodibromomethane	20.0	22.02		ug/L		110	71 - 121
Chloroform	20.0	20.50		ug/L		103	72 - 125
cis-1,2-Dichloroethene	20.0	20.65		ug/L		103	74 - 123
cis-1,3-Dichloropropene	20.0	22.80		ug/L		114	71 - 125
Dibromomethane	20.0	21.08		ug/L		105	74 - 125
Ethylbenzene	20.0	21.79		ug/L		109	74 - 122
Iodomethane	20.0	21.55		ug/L		108	10 - 150
Methylene chloride	20.0	20.33		ug/L		102	50 - 150
Styrene	20.0	22.36		ug/L		112	74 - 121
Tetrachloroethene	20.0	21.65		ug/L		108	71 - 130
Toluene	20.0	20.69		ug/L		103	74 - 123
trans-1,2-Dichloroethene	20.0	21.04		ug/L		105	70 - 126
trans-1,3-Dichloropropene	20.0	21.66		ug/L		108	69 - 123

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 310-422323/6

Matrix: Water

Analysis Batch: 422323

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
trans-1,4-Dichloro-2-butene	20.0	22.12		ug/L		111	50 - 150
Trichloroethene	20.0	21.85		ug/L		109	72 - 126
Vinyl acetate	40.0	41.86		ug/L		105	50 - 150
Xylenes, Total	40.0	43.12		ug/L		108	73 - 123

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	99		73 - 130
Toluene-d8 (Surr)	101		80 - 120
4-Bromofluorobenzene (Surr)	99		80 - 120

Lab Sample ID: LCS 310-422323/7

Matrix: Water

Analysis Batch: 422323

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Bromomethane	20.0	21.01		ug/L		105	23 - 150
Chloroethane	20.0	23.05		ug/L		115	54 - 136
Chloromethane	20.0	24.39		ug/L		122	38 - 150
Trichlorofluoromethane	20.0	23.58		ug/L		118	54 - 149
Vinyl chloride	20.0	24.72		ug/L		124	56 - 140

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	115		73 - 130
Toluene-d8 (Surr)	97		80 - 120
4-Bromofluorobenzene (Surr)	99		80 - 120

Lab Sample ID: MB 310-422325/5

Matrix: Water

Analysis Batch: 422325

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			05/22/24 09:21	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			05/22/24 09:21	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			05/22/24 09:21	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			05/22/24 09:21	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			05/22/24 09:21	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			05/22/24 09:21	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			05/22/24 09:21	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			05/22/24 09:21	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			05/22/24 09:21	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			05/22/24 09:21	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			05/22/24 09:21	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			05/22/24 09:21	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			05/22/24 09:21	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			05/22/24 09:21	1
2-Hexanone	<10.0		10.0	2.00	ug/L			05/22/24 09:21	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			05/22/24 09:21	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 310-422325/5

Matrix: Water

Analysis Batch: 422325

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Acetone	<10.0		10.0	3.10	ug/L			05/22/24 09:21	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			05/22/24 09:21	1
Benzene	<0.500		0.500	0.220	ug/L			05/22/24 09:21	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			05/22/24 09:21	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			05/22/24 09:21	1
Bromoform	<5.00		5.00	0.780	ug/L			05/22/24 09:21	1
Bromomethane	<4.00		4.00	1.10	ug/L			05/22/24 09:21	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			05/22/24 09:21	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			05/22/24 09:21	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			05/22/24 09:21	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			05/22/24 09:21	1
Chloroethane	<4.00		4.00	0.790	ug/L			05/22/24 09:21	1
Chloroform	<3.00		3.00	1.30	ug/L			05/22/24 09:21	1
Chloromethane	<3.00		3.00	0.610	ug/L			05/22/24 09:21	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			05/22/24 09:21	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			05/22/24 09:21	1
Dibromomethane	<1.00		1.00	0.330	ug/L			05/22/24 09:21	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			05/22/24 09:21	1
Iodomethane	<10.0		10.0	7.00	ug/L			05/22/24 09:21	1
Methylene chloride	<5.00		5.00	1.70	ug/L			05/22/24 09:21	1
Styrene	<1.00		1.00	0.370	ug/L			05/22/24 09:21	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			05/22/24 09:21	1
Toluene	<1.00		1.00	0.430	ug/L			05/22/24 09:21	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			05/22/24 09:21	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			05/22/24 09:21	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			05/22/24 09:21	1
Trichloroethene	<1.00		1.00	0.430	ug/L			05/22/24 09:21	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			05/22/24 09:21	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			05/22/24 09:21	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			05/22/24 09:21	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			05/22/24 09:21	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Dibromofluoromethane (Surr)	111		73 - 130		05/22/24 09:21	1
Toluene-d8 (Surr)	97		80 - 120		05/22/24 09:21	1
4-Bromofluorobenzene (Surr)	100		80 - 120		05/22/24 09:21	1

Lab Sample ID: LCS 310-422325/6

Matrix: Water

Analysis Batch: 422325

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	20.0	21.68		ug/L		108	73 - 129
1,1,2,2-Tetrachloroethane	20.0	21.80		ug/L		109	68 - 124
1,1,2-Trichloroethane	20.0	23.75		ug/L		119	73 - 123
1,1-Dichloroethane	20.0	21.25		ug/L		106	70 - 127

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 310-422325/6

Matrix: Water

Analysis Batch: 422325

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec Limits
	Added	Result	Qualifier				
1,1-Dichloroethene	20.0	21.12		ug/L		106	63 - 132
1,2,3-Trichloropropane	20.0	22.76		ug/L		114	65 - 127
1,2-Dibromo-3-chloropropane	20.0	21.19		ug/L		106	50 - 150
1,2-Dibromoethane (EDB)	20.0	23.14		ug/L		116	75 - 125
1,2-Dichlorobenzene	20.0	22.01		ug/L		110	74 - 120
1,2-Dichloroethane	20.0	22.25		ug/L		111	71 - 125
1,2-Dichloropropane	20.0	23.00		ug/L		115	73 - 124
1,4-Dichlorobenzene	20.0	21.89		ug/L		109	72 - 120
2-Butanone (MEK)	40.0	46.95		ug/L		117	50 - 150
2-Hexanone	40.0	48.18		ug/L		120	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	48.02		ug/L		120	60 - 139
Acetone	40.0	46.08		ug/L		115	50 - 150
Acrylonitrile	200	227.6		ug/L		114	50 - 150
Benzene	20.0	21.80		ug/L		109	72 - 124
Bromochloromethane	20.0	21.36		ug/L		107	73 - 130
Bromodichloromethane	20.0	21.58		ug/L		108	74 - 122
Bromoform	20.0	21.58		ug/L		108	61 - 122
Carbon disulfide	20.0	20.78		ug/L		104	59 - 135
Carbon tetrachloride	20.0	23.11		ug/L		116	67 - 132
Chlorobenzene	20.0	21.92		ug/L		110	76 - 120
Chlorodibromomethane	20.0	22.58		ug/L		113	71 - 121
Chloroform	20.0	20.85		ug/L		104	72 - 125
cis-1,2-Dichloroethene	20.0	20.75		ug/L		104	74 - 123
cis-1,3-Dichloropropene	20.0	22.31		ug/L		112	71 - 125
Dibromomethane	20.0	21.58		ug/L		108	74 - 125
Ethylbenzene	20.0	22.41		ug/L		112	74 - 122
Iodomethane	20.0	21.19		ug/L		106	10 - 150
Methylene chloride	20.0	20.55		ug/L		103	50 - 150
Styrene	20.0	22.80		ug/L		114	74 - 121
Tetrachloroethene	20.0	22.17		ug/L		111	71 - 130
Toluene	20.0	21.21		ug/L		106	74 - 123
trans-1,2-Dichloroethene	20.0	21.11		ug/L		106	70 - 126
trans-1,3-Dichloropropene	20.0	20.95		ug/L		105	69 - 123
trans-1,4-Dichloro-2-butene	20.0	23.26		ug/L		116	50 - 150
Trichloroethene	20.0	22.19		ug/L		111	72 - 126
Vinyl acetate	40.0	41.12		ug/L		103	50 - 150
Xylenes, Total	40.0	44.34		ug/L		111	73 - 123

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	99		73 - 130
Toluene-d8 (Surr)	101		80 - 120
4-Bromofluorobenzene (Surr)	100		80 - 120

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 310-422325/7

Matrix: Water

Analysis Batch: 422325

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	20.11		ug/L		101	23 - 150
Chloroethane	20.0	22.09		ug/L		110	54 - 136
Chloromethane	20.0	23.22		ug/L		116	38 - 150
Trichlorofluoromethane	20.0	22.66		ug/L		113	54 - 149
Vinyl chloride	20.0	23.65		ug/L		118	56 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	110		73 - 130
Toluene-d8 (Surr)	98		80 - 120
4-Bromofluorobenzene (Surr)	100		80 - 120

Lab Sample ID: 310-281485-4 MS

Matrix: Water

Analysis Batch: 422325

Client Sample ID: PZ-14

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	<1.00		20.0	19.33		ug/L		97	55 - 130
1,1,1-Trichloroethane	<1.00		20.0	18.44		ug/L		92	52 - 130
1,1,2,2-Tetrachloroethane	<1.00		20.0	20.41		ug/L		102	54 - 130
1,1,2-Trichloroethane	<1.00		20.0	20.73		ug/L		104	58 - 130
1,1-Dichloroethane	<1.00		20.0	18.54		ug/L		93	49 - 130
1,1-Dichloroethene	<2.00		20.0	17.76		ug/L		89	37 - 132
1,2,3-Trichloropropane	<1.00		20.0	20.21		ug/L		101	49 - 130
1,2-Dibromo-3-chloropropane	<5.00		20.0	20.11		ug/L		101	38 - 150
1,2-Dibromoethane (EDB)	<1.00		20.0	20.45		ug/L		102	60 - 130
1,2-Dichlorobenzene	<1.00		20.0	19.02		ug/L		95	59 - 130
1,2-Dichloroethane	<1.00		20.0	20.46		ug/L		102	51 - 130
1,2-Dichloropropane	<1.00		20.0	20.78		ug/L		104	57 - 130
1,4-Dichlorobenzene	<1.00		20.0	18.72		ug/L		94	57 - 130
2-Butanone (MEK)	<10.0		40.0	42.54		ug/L		106	38 - 150
2-Hexanone	<10.0		40.0	44.22		ug/L		111	46 - 140
4-Methyl-2-pentanone (MIBK)	<10.0		40.0	44.29		ug/L		111	47 - 139
Acetone	<10.0		40.0	40.93		ug/L		102	31 - 150
Acrylonitrile	<5.00		200	206.3		ug/L		103	40 - 150
Benzene	<0.500		20.0	19.49		ug/L		97	46 - 130
Bromochloromethane	<5.00		20.0	19.53		ug/L		98	57 - 130
Bromodichloromethane	<1.00		20.0	19.52		ug/L		98	57 - 130
Bromoform	<5.00		20.0	19.16		ug/L		96	44 - 130
Carbon disulfide	<1.00		20.0	20.68		ug/L		103	38 - 135
Carbon tetrachloride	<2.00		20.0	20.14		ug/L		101	45 - 132
Chlorobenzene	<1.00		20.0	19.37		ug/L		97	59 - 130
Chlorodibromomethane	<5.00		20.0	19.98		ug/L		100	54 - 130
Chloroform	<3.00		20.0	18.46		ug/L		92	51 - 130
cis-1,2-Dichloroethene	<1.00		20.0	18.48		ug/L		92	45 - 130
cis-1,3-Dichloropropene	<5.00		20.0	18.81		ug/L		94	53 - 130
Dibromomethane	<1.00		20.0	19.29		ug/L		96	59 - 130
Ethylbenzene	<1.00		20.0	18.80		ug/L		94	45 - 130

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 310-281485-4 MS

Matrix: Water

Analysis Batch: 422325

Client Sample ID: PZ-14

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier					
Iodomethane	<10.0		20.0	21.39		ug/L		107		10 - 150
Methylene chloride	<5.00		20.0	18.34		ug/L		92		37 - 150
Styrene	<1.00		20.0	19.14		ug/L		96		47 - 130
Tetrachloroethene	<1.00		20.0	17.98		ug/L		90		47 - 130
Toluene	<1.00		20.0	18.29		ug/L		91		51 - 130
trans-1,2-Dichloroethene	<1.00		20.0	18.73		ug/L		94		48 - 130
trans-1,3-Dichloropropene	<5.00		20.0	18.09		ug/L		90		50 - 130
trans-1,4-Dichloro-2-butene	<10.0		20.0	14.45		ug/L		72		26 - 150
Trichloroethene	<1.00		20.0	18.74		ug/L		94		51 - 130
Vinyl acetate	<10.0		40.0	34.12		ug/L		85		29 - 150
Xylenes, Total	<3.00		40.0	37.57		ug/L		94		43 - 130

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	98		73 - 130
Toluene-d8 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	101		80 - 120

Lab Sample ID: 310-281485-4 MSD

Matrix: Water

Analysis Batch: 422325

Client Sample ID: PZ-14

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier						RPD	Limit
1,1,1,2-Tetrachloroethane	<1.00		20.0	19.98		ug/L		100		55 - 130	3	20
1,1,1-Trichloroethane	<1.00		20.0	18.59		ug/L		93		52 - 130	1	20
1,1,2,2-Tetrachloroethane	<1.00		20.0	20.26		ug/L		101		54 - 130	1	20
1,1,2-Trichloroethane	<1.00		20.0	21.44		ug/L		107		58 - 130	3	20
1,1-Dichloroethane	<1.00		20.0	18.58		ug/L		93		49 - 130	0	20
1,1-Dichloroethene	<2.00		20.0	17.60		ug/L		88		37 - 132	1	26
1,2,3-Trichloropropane	<1.00		20.0	20.46		ug/L		102		49 - 130	1	26
1,2-Dibromo-3-chloropropane	<5.00		20.0	20.50		ug/L		103		38 - 150	2	20
1,2-Dibromoethane (EDB)	<1.00		20.0	20.86		ug/L		104		60 - 130	2	20
1,2-Dichlorobenzene	<1.00		20.0	19.90		ug/L		100		59 - 130	5	20
1,2-Dichloroethane	<1.00		20.0	20.53		ug/L		103		51 - 130	0	20
1,2-Dichloropropane	<1.00		20.0	21.16		ug/L		106		57 - 130	2	20
1,4-Dichlorobenzene	<1.00		20.0	19.44		ug/L		97		57 - 130	4	20
2-Butanone (MEK)	<10.0		40.0	43.30		ug/L		108		38 - 150	2	20
2-Hexanone	<10.0		40.0	45.42		ug/L		114		46 - 140	3	20
4-Methyl-2-pentanone (MIBK)	<10.0		40.0	45.94		ug/L		115		47 - 139	4	20
Acetone	<10.0		40.0	40.40		ug/L		101		31 - 150	1	29
Acrylonitrile	<5.00		200	210.5		ug/L		105		40 - 150	2	20
Benzene	<0.500		20.0	19.43		ug/L		97		46 - 130	0	20
Bromochloromethane	<5.00		20.0	19.52		ug/L		98		57 - 130	0	20
Bromodichloromethane	<1.00		20.0	19.57		ug/L		98		57 - 130	0	20
Bromoform	<5.00		20.0	19.49		ug/L		97		44 - 130	2	20
Carbon disulfide	<1.00		20.0	19.49		ug/L		97		38 - 135	6	30
Carbon tetrachloride	<2.00		20.0	20.13		ug/L		101		45 - 132	0	20
Chlorobenzene	<1.00		20.0	19.60		ug/L		98		59 - 130	1	20

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 310-281485-4 MSD

Matrix: Water

Analysis Batch: 422325

Client Sample ID: PZ-14

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
Chlorodibromomethane	<5.00		20.0	20.47		ug/L		102	54 - 130	2	20
Chloroform	<3.00		20.0	18.59		ug/L		93	51 - 130	1	20
cis-1,2-Dichloroethene	<1.00		20.0	18.57		ug/L		93	45 - 130	1	20
cis-1,3-Dichloropropene	<5.00		20.0	19.20		ug/L		96	53 - 130	2	20
Dibromomethane	<1.00		20.0	19.81		ug/L		99	59 - 130	3	20
Ethylbenzene	<1.00		20.0	19.08		ug/L		95	45 - 130	1	20
Iodomethane	<10.0		20.0	21.52		ug/L		108	10 - 150	1	35
Methylene chloride	<5.00		20.0	18.74		ug/L		94	37 - 150	2	24
Styrene	<1.00		20.0	19.44		ug/L		97	47 - 130	2	20
Tetrachloroethene	<1.00		20.0	18.12		ug/L		91	47 - 130	1	20
Toluene	<1.00		20.0	18.52		ug/L		93	51 - 130	1	20
trans-1,2-Dichloroethene	<1.00		20.0	18.39		ug/L		92	48 - 130	2	22
trans-1,3-Dichloropropene	<5.00		20.0	18.12		ug/L		91	50 - 130	0	20
trans-1,4-Dichloro-2-butene	<10.0		20.0	14.76		ug/L		74	26 - 150	2	23
Trichloroethene	<1.00		20.0	18.94		ug/L		95	51 - 130	1	20
Vinyl acetate	<10.0		40.0	33.86		ug/L		85	29 - 150	1	23
Xylenes, Total	<3.00		40.0	38.29		ug/L		96	43 - 130	2	20

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	100		73 - 130
Toluene-d8 (Surr)	101		80 - 120
4-Bromofluorobenzene (Surr)	100		80 - 120

## Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-422796/3

Matrix: Water

Analysis Batch: 422796

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Sulfate	<1.00		1.00	0.420	mg/L			05/23/24 11:12	1

Lab Sample ID: LCS 310-422796/6

Matrix: Water

Analysis Batch: 422796

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec
		Result	Qualifier				Limits
Sulfate	10.0	10.43		mg/L		104	90 - 110

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

Lab Sample ID: MB 310-422063/1-A

Matrix: Water

Analysis Batch: 422392

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 422063

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	<0.0500		0.0500	0.0210	mg/L		05/20/24 09:30	05/21/24 15:25	1
Antimony	<0.00200		0.00200	0.00100	mg/L		05/20/24 09:30	05/21/24 15:25	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

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

**Lab Sample ID: MB 310-422063/1-A**  
**Matrix: Water**  
**Analysis Batch: 422392**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 422063**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200	0.000530	mg/L		05/20/24 09:30	05/21/24 15:25	1
Barium	<0.00200		0.00200	0.000660	mg/L		05/20/24 09:30	05/21/24 15:25	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		05/20/24 09:30	05/21/24 15:25	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		05/20/24 09:30	05/21/24 15:25	1
Chromium	<0.00500		0.00500	0.00120	mg/L		05/20/24 09:30	05/21/24 15:25	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		05/20/24 09:30	05/21/24 15:25	1
Copper	<0.00500		0.00500	0.00180	mg/L		05/20/24 09:30	05/21/24 15:25	1
Lead	<0.000500		0.000500	0.000260	mg/L		05/20/24 09:30	05/21/24 15:25	1
Nickel	<0.00500		0.00500	0.00210	mg/L		05/20/24 09:30	05/21/24 15:25	1
Selenium	<0.00500		0.00500	0.00140	mg/L		05/20/24 09:30	05/21/24 15:25	1
Silver	<0.00100		0.00100	0.000500	mg/L		05/20/24 09:30	05/21/24 15:25	1
Thallium	<0.00100		0.00100	0.000570	mg/L		05/20/24 09:30	05/21/24 15:25	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		05/20/24 09:30	05/21/24 15:25	1
Zinc	<0.0200		0.0200	0.00970	mg/L		05/20/24 09:30	05/21/24 15:25	1
Iron	<0.100		0.100	0.0360	mg/L		05/20/24 09:30	05/21/24 15:25	1

**Lab Sample ID: LCS 310-422063/2-A**  
**Matrix: Water**  
**Analysis Batch: 422392**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 422063**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.200	0.2143		mg/L		107	80 - 120
Antimony	0.200	0.2243		mg/L		112	80 - 120
Arsenic	0.200	0.2050		mg/L		102	80 - 120
Barium	0.100	0.1057		mg/L		106	80 - 120
Beryllium	0.100	0.09458		mg/L		95	80 - 120
Cadmium	0.100	0.09819		mg/L		98	80 - 120
Chromium	0.100	0.09288		mg/L		93	80 - 120
Cobalt	0.100	0.09643		mg/L		96	80 - 120
Copper	0.200	0.2101		mg/L		105	80 - 120
Lead	0.200	0.2109		mg/L		105	80 - 120
Nickel	0.200	0.2050		mg/L		102	80 - 120
Selenium	0.400	0.4025		mg/L		101	80 - 120
Silver	0.100	0.1115		mg/L		111	80 - 120
Thallium	0.100	0.1174		mg/L		117	80 - 120
Vanadium	0.100	0.1006		mg/L		101	80 - 120
Zinc	0.200	0.1834		mg/L		92	80 - 120
Iron	0.200	0.2130		mg/L		107	80 - 120

**Lab Sample ID: 310-281485-3 DU**  
**Matrix: Water**  
**Analysis Batch: 422392**

**Client Sample ID: UW-11**  
**Prep Type: Total/NA**  
**Prep Batch: 422063**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Aluminum	<0.0500		<0.0500		mg/L		NC	20
Antimony	<0.00200		<0.00200		mg/L		NC	20
Arsenic	0.000724	J	0.0007270	J	mg/L		0.4	20
Barium	0.0165		0.01695		mg/L		2	20

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

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

Lab Sample ID: 310-281485-3 DU  
 Matrix: Water  
 Analysis Batch: 422392

Client Sample ID: UW-11  
 Prep Type: Total/NA  
 Prep Batch: 422063

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	<0.000200		<0.000200		mg/L		NC	20
Chromium	<0.00500		<0.00500		mg/L		NC	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Nickel	<0.00500		<0.00500		mg/L		NC	20
Selenium	<0.00500		<0.00500		mg/L		NC	20
Silver	<0.00100		<0.00100		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20
Vanadium	<0.00500		<0.00500		mg/L		NC	20
Zinc	<0.0200		<0.0200		mg/L		NC	20
Iron	33.2		33.51		mg/L		0.8	20

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

Lab Sample ID: MB 310-422173/1  
 Matrix: Water  
 Analysis Batch: 422173

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Suspended Solids	<5.00		5.00	3.70	mg/L			05/20/24 10:17	1

Lab Sample ID: LCS 310-422173/2  
 Matrix: Water  
 Analysis Batch: 422173

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

## Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-422386/26  
 Matrix: Water  
 Analysis Batch: 422386

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

Lab Sample ID: LCS 310-422386/3  
 Matrix: Water  
 Analysis Batch: 422386

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Method: SM 2320B - Alkalinity (Continued)

**Lab Sample ID: 310-281485-2 DU**  
**Matrix: Water**  
**Analysis Batch: 422386**

**Client Sample ID: UW-10**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Alkalinity as CaCO3 to pH 4.5	705		693.8		mg/L		2	16

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# QC Association Summary

Client: SCS Engineers  
Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
HMSP

Job ID: 310-281485-1

## GC/MS VOA

### Analysis Batch: 422323

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	8260D	
310-281485-2	UW-10	Total/NA	Water	8260D	
MB 310-422323/5	Method Blank	Total/NA	Water	8260D	
LCS 310-422323/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-422323/7	Lab Control Sample	Total/NA	Water	8260D	

### Analysis Batch: 422325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-3	UW-11	Total/NA	Water	8260D	
310-281485-4	PZ-14	Total/NA	Water	8260D	
310-281485-5	DW-19	Total/NA	Water	8260D	
310-281485-6	DW-23	Total/NA	Water	8260D	
310-281485-7	DW-24	Total/NA	Water	8260D	
310-281485-8	MW-D	Total/NA	Water	8260D	
310-281485-9	Trip Blank	Total/NA	Water	8260D	
MB 310-422325/5	Method Blank	Total/NA	Water	8260D	
LCS 310-422325/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-422325/7	Lab Control Sample	Total/NA	Water	8260D	
310-281485-4 MS	PZ-14	Total/NA	Water	8260D	
310-281485-4 MSD	PZ-14	Total/NA	Water	8260D	

## HPLC/IC

### Analysis Batch: 422796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	9056A	
310-281485-2	UW-10	Total/NA	Water	9056A	
310-281485-3	UW-11	Total/NA	Water	9056A	
310-281485-4	PZ-14	Total/NA	Water	9056A	
310-281485-5	DW-19	Total/NA	Water	9056A	
310-281485-6	DW-23	Total/NA	Water	9056A	
310-281485-7	DW-24	Total/NA	Water	9056A	
310-281485-8	MW-D	Total/NA	Water	9056A	
310-281485-10	DW-15	Total/NA	Water	9056A	
MB 310-422796/3	Method Blank	Total/NA	Water	9056A	
LCS 310-422796/6	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 422063

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	3005A	
310-281485-2	UW-10	Total/NA	Water	3005A	
310-281485-3	UW-11	Total/NA	Water	3005A	
310-281485-4	PZ-14	Total/NA	Water	3005A	
310-281485-5	DW-19	Total/NA	Water	3005A	
310-281485-6	DW-23	Total/NA	Water	3005A	
310-281485-7	DW-24	Total/NA	Water	3005A	
310-281485-8	MW-D	Total/NA	Water	3005A	
310-281485-10	DW-15	Total/NA	Water	3005A	
MB 310-422063/1-A	Method Blank	Total/NA	Water	3005A	

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

## Metals (Continued)

### Prep Batch: 422063 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-422063/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-281485-3 DU	UW-11	Total/NA	Water	3005A	

### Analysis Batch: 422392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	6020B	422063
310-281485-2	UW-10	Total/NA	Water	6020B	422063
310-281485-3	UW-11	Total/NA	Water	6020B	422063
310-281485-4	PZ-14	Total/NA	Water	6020B	422063
310-281485-5	DW-19	Total/NA	Water	6020B	422063
310-281485-6	DW-23	Total/NA	Water	6020B	422063
310-281485-7	DW-24	Total/NA	Water	6020B	422063
310-281485-8	MW-D	Total/NA	Water	6020B	422063
310-281485-10	DW-15	Total/NA	Water	6020B	422063
MB 310-422063/1-A	Method Blank	Total/NA	Water	6020B	422063
LCS 310-422063/2-A	Lab Control Sample	Total/NA	Water	6020B	422063
310-281485-3 DU	UW-11	Total/NA	Water	6020B	422063

### Analysis Batch: 422521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-4	PZ-14	Total/NA	Water	6020B	422063
310-281485-7	DW-24	Total/NA	Water	6020B	422063
310-281485-8	MW-D	Total/NA	Water	6020B	422063

## General Chemistry

### Analysis Batch: 422173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	I-3765-85	
310-281485-2	UW-10	Total/NA	Water	I-3765-85	
310-281485-3	UW-11	Total/NA	Water	I-3765-85	
310-281485-4	PZ-14	Total/NA	Water	I-3765-85	
310-281485-5	DW-19	Total/NA	Water	I-3765-85	
310-281485-6	DW-23	Total/NA	Water	I-3765-85	
310-281485-7	DW-24	Total/NA	Water	I-3765-85	
310-281485-8	MW-D	Total/NA	Water	I-3765-85	
MB 310-422173/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-422173/2	Lab Control Sample	Total/NA	Water	I-3765-85	

### Analysis Batch: 422386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-281485-1	DW-8	Total/NA	Water	SM 2320B	
310-281485-2	UW-10	Total/NA	Water	SM 2320B	
310-281485-3	UW-11	Total/NA	Water	SM 2320B	
310-281485-4	PZ-14	Total/NA	Water	SM 2320B	
310-281485-5	DW-19	Total/NA	Water	SM 2320B	
310-281485-6	DW-23	Total/NA	Water	SM 2320B	
310-281485-7	DW-24	Total/NA	Water	SM 2320B	
310-281485-8	MW-D	Total/NA	Water	SM 2320B	
310-281485-10	DW-15	Total/NA	Water	SM 2320B	

Eurofins Cedar Falls

# QC Association Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

## General Chemistry (Continued)

### Analysis Batch: 422386 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-422386/26	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 310-422386/3	Lab Control Sample	Total/NA	Water	SM 2320B	
310-281485-2 DU	UW-10	Total/NA	Water	SM 2320B	

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# Lab Chronicle

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

**Client Sample ID: DW-8**

**Lab Sample ID: 310-281485-1**

Date Collected: 05/14/24 14:51

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422323	FE5V	EET CF	05/22/24 04:49
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 13:42
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:05
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 18:14

**Client Sample ID: UW-10**

**Lab Sample ID: 310-281485-2**

Date Collected: 05/14/24 16:11

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422323	FE5V	EET CF	05/22/24 05:12
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 14:20
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:07
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 18:25

**Client Sample ID: UW-11**

**Lab Sample ID: 310-281485-3**

Date Collected: 05/14/24 17:50

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 11:21
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 14:33
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:09
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 18:49

**Client Sample ID: PZ-14**

**Lab Sample ID: 310-281485-4**

Date Collected: 05/14/24 18:31

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 11:43
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 14:45
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:22
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		4	422521	NFT2	EET CF	05/22/24 13:04
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17

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# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: PZ-14**  
 Date Collected: 05/14/24 18:31  
 Date Received: 05/16/24 16:15

**Lab Sample ID: 310-281485-4**  
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:01

**Client Sample ID: DW-19**  
 Date Collected: 05/14/24 13:22  
 Date Received: 05/16/24 16:15

**Lab Sample ID: 310-281485-5**  
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 12:06
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 14:58
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:25
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:08

**Client Sample ID: DW-23**  
 Date Collected: 05/14/24 17:05  
 Date Received: 05/16/24 16:15

**Lab Sample ID: 310-281485-6**  
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 12:29
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 15:11
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:27
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:19

**Client Sample ID: DW-24**  
 Date Collected: 05/14/24 12:18  
 Date Received: 05/16/24 16:15

**Lab Sample ID: 310-281485-7**  
 Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 12:52
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 15:23
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:29
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422521	NFT2	EET CF	05/22/24 13:15
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:26



# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024  
 HMSP

Job ID: 310-281485-1

**Client Sample ID: MW-D**

**Lab Sample ID: 310-281485-8**

Date Collected: 05/14/24 12:18

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 13:14
Total/NA	Analysis	9056A		100	422796	QTZ5	EET CF	05/23/24 15:36
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:31
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422521	NFT2	EET CF	05/22/24 13:17
Total/NA	Analysis	I-3765-85		1	422173	HE7K	EET CF	05/20/24 10:17
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:29

**Client Sample ID: Trip Blank**

**Lab Sample ID: 310-281485-9**

Date Collected: 05/14/24 00:00

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	422325	FE5V	EET CF	05/22/24 10:35

**Client Sample ID: DW-15**

**Lab Sample ID: 310-281485-10**

Date Collected: 05/14/24 14:00

Matrix: Water

Date Received: 05/16/24 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	422796	QTZ5	EET CF	05/23/24 15:19
Total/NA	Prep	3005A			422063	KM3E	EET CF	05/20/24 09:30
Total/NA	Analysis	6020B		1	422392	NFT2	EET CF	05/21/24 16:33
Total/NA	Analysis	SM 2320B		1	422386	WZC8	EET CF	05/21/24 19:40

**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: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

## 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

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# Method Summary

Client: SCS Engineers

Job ID: 310-281485-1

Project/Site: Mahaska Co SLF Binns and Stevens 1st 2024

HMSP

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2320B	Alkalinity	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

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



Environment Testing  
America



310-281485 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SLS</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>5/16/24</u>	TIME <u>16:15</u>	Received By: <u>SP</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<u>DW-24, DW-15, MW-17, DW-23</u>			
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>1</u>	Correction Factor (°C): <u>0</u>	
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>3.9</u>	Corrected Temp (°C): <u>3.9</u>	
<b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			



Environment Testing  
America

Place COC scanning label  
here

Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>5/16/24</u>	<u>16:15</u>	<u>SP</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<u>UW-10, DW-8, DW-19, UW-11, Trip blank, PZ-14</u>			
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>P</u>	Correction Factor (°C):	<u>0</u>
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>1.5</u>	Corrected Temp (°C):	<u>1.5</u>
<b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			

Cedar Falls IA 50613-6907  
phone 319 277 2401 fax 319 277 2425

TestAmerica Laboratories Inc db/a Eurofins TestAmerica

Regulatory Program  DW  NPDES  RCRA  Other

Client Contact Nathan Oht Email: noht@scsengineers.com Cell 319-331-9613		Project Manager Nathan Oht Email: noht@scsengineers.com Cell 319-331-9613		Site Contact: Joe Farris Lab Contact:		Date Carrier		COC No 1 1 of 1 COCs	
SCS Engineers		Analysis Turnaround Time <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS Other: <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		Appendix I Perform MS / MSD (Y / N)		Sulfate		Sampler	
Project Name 1st 2024 HMSP Site Mahaska County Landfill Binns and Stevens P O # 2723204 24		Sample Date		Sample Time		Sample Type (C=Comp G=Grab)		For Lab Use Only Walk-in Client Lab Sampling	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp G=Grab)		Job / SDG No	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp G=Grab)		Sample Specific Notes	
DW-8		5/14/24	14:51	G	W	N	Y	X	
UW-9R				G	W	N	Y	X	
US-9RA				G	W	N	Y	X	
UW 10		5/14/24	16:11	G	W	N	Y	X	
UW-11		5/14/24	17:30	G	W	N	Y	X	
PZ 14		5/14/24	18:31	G	W	N	Y	X	
DW 15				G	W	N	Y	X	
DW-19		5/14/24	13:22	G	W	N	Y	X	
UW-21				G	W	N	Y	X	
DW-23		5/14/24	17:05	G	W	N	Y	X	
DW-24		5/14/24	12:18	G	W	N	Y	X	
MW-D		5/14/24	12:18	G	W	N	Y	X	
GU-1				G	W	N	Y	X	
Trip Blank									X
<p>Preservation Used 1= Ice, 2= HCl; 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other</p> <p>Possible Hazard Identification Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample</p> <p><input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Unknown</p> <p>Special Instructions/QC Requirements &amp; Comments</p>									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No		Cooler Temp (°C)		Obs'd		Corr'd	
Relinquished by Cole Tesar		Company SCS		Date/Time 5/16/24 14:00		Received by		Company	
Relinquished by		Company		Date/Time		Received by		Company	
Relinquished by		Company		Date/Time		Received in Laboratory by SD		Company EF	
				Date/Time 5/16/24 16:15					



## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-281485-1

SDG Number:

**Login Number: 281485**

**List Number: 1**

**Creator: Homolar, Dana J**

**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.	True	
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.	False	DW-5 sample received not on COC logged at end
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	

# ANALYTICAL REPORT

## PREPARED FOR

Attn: Nathan Ohrt

SCS Engineers

1690 All State Court

Suite 100

West Des Moines, Iowa 50265

Generated 1/21/2025 12:53:18 PM Revision 1

## JOB DESCRIPTION

2nd 2024 HMSP Sampling Event

Mahaska County Sanitary Landfill, Binns & Stevens

## JOB NUMBER

310-295795-1



# Eurofins Cedar Falls

## 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  
[Samuel.Miller@et.eurofinsus.com](mailto:Samuel.Miller@et.eurofinsus.com)  
(319)277-2401



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# Case Narrative

Client: SCS Engineers  
Project: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1

**Job ID: 310-295795-1**

**Eurofins Cedar Falls**

## Job Narrative 310-295795-1

### REVISION

The report being provided is a revision of the original report sent on 12/5/2024. The report (revision 1) is being revised due to list of Metal analytes changed.

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 11/21/2024 4:25 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 2.1°C, 2.7°C and 17.4°C.

### **GC/MS VOA**

Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440646 recovered below the lower control limit for Trichlorofluoromethane (-29.2 %D). The laboratory control sample associated with this CCV was within CCV control criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440646/4).

Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): Trip Blank 3 (310-295795-11).

Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440638 recovered above the upper control limit for Trichloroethene(26.0D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440638/3).

Method 8260D: The preservative used in the sample containers provided is not compatible with one of the Method 8260 analytes requested. The following sample was received preserved with hydrochloric acid : Trip Blank 3 (310-295795-11). The requested target analyte list includes acrylonitrile, acid-labile compounds that degrades in an acidic medium.

Method 8260D: The preservative used in the sample containers provided is not compatible with one of the Method 8260 analytes requested. The following samples were received preserved with hydrochloric acid : DW-8 (310-295795-1), UW-10 (310-295795-2), UW-11 (310-295795-3), PZ-14 (310-295795-4), DW-19 (310-295795-5), DW-23 (310-295795-6), DW-24 (310-295795-7), MW-D (310-295795-8), Trip Blank 1 (310-295795-9) and Trip Blank 2 (310-295795-10). The requested target analyte list includes acrylonitrile, acid-labile compounds that degrades in an acidic medium.

Method 8260D: The following sample was analyzed outside of analytical holding time for Acrylonitrile.: DW-19 (310-295795-5).

Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440950 recovered outside the control limit for Chloroethane(-23.7%D). The LCS associated with this CCV passes CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440950/4).

Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): Trip Blank 3 (310-295795-11).

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

### **HPLC/IC**

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# Case Narrative

Client: SCS Engineers  
Project: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1

## Job ID: 310-295795-1 (Continued)

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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.

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# Sample Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-295795-1	DW-8	Water	11/18/24 10:30	11/21/24 16:25
310-295795-2	UW-10	Water	11/20/24 11:02	11/21/24 16:25
310-295795-3	UW-11	Water	11/20/24 12:23	11/21/24 16:25
310-295795-4	PZ-14	Water	11/20/24 11:48	11/21/24 16:25
310-295795-5	DW-19	Water	11/18/24 14:57	11/21/24 16:25
310-295795-6	DW-23	Water	11/20/24 13:01	11/21/24 16:25
310-295795-7	DW-24	Water	11/18/24 13:39	11/21/24 16:25
310-295795-8	MW-D	Water	11/18/24 14:57	11/21/24 16:25
310-295795-9	Trip Blank 1	Water	11/18/24 00:00	11/21/24 16:25
310-295795-10	Trip Blank 2	Water	11/18/24 00:00	11/21/24 16:25
310-295795-11	Trip Blank 3	Water	11/18/24 00:00	11/21/24 16:25

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# Detection Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Client Sample ID: DW-8

## Lab Sample ID: 310-295795-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	1.49		1.00	0.220	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	1.29		1.00	0.210	ug/L	1		8260D	Total/NA
Sulfate	378		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	1.38		0.0500	0.0210	mg/L	1		6020B	Total/NA
Iron	18.2		0.100	0.0360	mg/L	1		6020B	Total/NA
Cadmium	0.000171	J	0.000200	0.000100	mg/L	1		6020B	Total/NA
Barium	0.0516		0.00200	0.000660	mg/L	1		6020B	Total/NA
Nickel	0.00524		0.00500	0.00210	mg/L	1		6020B	Total/NA
Arsenic	0.00192	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Copper	0.00220	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.00370		0.000500	0.000260	mg/L	1		6020B	Total/NA
Zinc	0.0154	J	0.0200	0.00970	mg/L	1		6020B	Total/NA
Cobalt	0.00856		0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	62.0		3.75	2.78	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	488		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: UW-10

## Lab Sample ID: 310-295795-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dichlorobenzene	5.70		1.00	0.230	ug/L	1		8260D	Total/NA
Benzene	2.00		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	0.471	J	1.00	0.400	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.835	J	1.00	0.210	ug/L	1		8260D	Total/NA
Sulfate	934		100	42.0	mg/L	100		9056A	Total/NA
Iron	43.1		0.100	0.0360	mg/L	1		6020B	Total/NA
Cadmium	0.000131	J	0.000200	0.000100	mg/L	1		6020B	Total/NA
Barium	0.0216		0.00200	0.000660	mg/L	1		6020B	Total/NA
Arsenic	0.00155	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Cobalt	0.00831		0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	8.75		3.75	2.78	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	636		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: UW-11

## Lab Sample ID: 310-295795-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1970		100	42.0	mg/L	100		9056A	Total/NA
Iron	30.6		0.100	0.0360	mg/L	1		6020B	Total/NA
Barium	0.0216		0.00200	0.000660	mg/L	1		6020B	Total/NA
Nickel	0.00511		0.00500	0.00210	mg/L	1		6020B	Total/NA
Arsenic	0.00177	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Cobalt	0.000618		0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	7.38		1.88	1.39	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	532		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: PZ-14

## Lab Sample ID: 310-295795-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	942		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	0.737		0.0500	0.0210	mg/L	1		6020B	Total/NA
Iron	139		0.400	0.144	mg/L	4		6020B	Total/NA
Barium	0.0435		0.00200	0.000660	mg/L	1		6020B	Total/NA
Nickel	0.00647		0.00500	0.00210	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Client Sample ID: PZ-14 (Continued)

## Lab Sample ID: 310-295795-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vanadium	0.00122	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Arsenic	0.00106	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Lead	0.000581		0.000500	0.000260	mg/L	1		6020B	Total/NA
Zinc	0.0313		0.0200	0.00970	mg/L	1		6020B	Total/NA
Chromium	0.00139	J	0.00500	0.00120	mg/L	1		6020B	Total/NA
Cobalt	0.00620		0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	60.0		15.0	11.1	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	50.4		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-19

## Lab Sample ID: 310-295795-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	579		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	0.176	F1 F2	0.0500	0.0210	mg/L	1		6020B	Total/NA
Iron	0.205	F1 F2	0.100	0.0360	mg/L	1		6020B	Total/NA
Cadmium	0.000176	J	0.000200	0.000100	mg/L	1		6020B	Total/NA
Barium	0.0255		0.00200	0.000660	mg/L	1		6020B	Total/NA
Lead	0.000261	J	0.000500	0.000260	mg/L	1		6020B	Total/NA
Cobalt	0.000304	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	12.9		1.88	1.39	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	294		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-23

## Lab Sample ID: 310-295795-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	3880		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	4.74		0.200	0.0840	mg/L	4		6020B	Total/NA
Iron	60.7		0.400	0.144	mg/L	4		6020B	Total/NA
Cadmium	0.00512		0.000800	0.000400	mg/L	4		6020B	Total/NA
Beryllium	0.00264	J	0.00400	0.00132	mg/L	4		6020B	Total/NA
Barium	0.0133		0.00800	0.00264	mg/L	4		6020B	Total/NA
Nickel	1.33		0.0200	0.00840	mg/L	4		6020B	Total/NA
Silver	0.00413		0.00400	0.00200	mg/L	4		6020B	Total/NA
Lead	0.000736		0.000500	0.000260	mg/L	1		6020B	Total/NA
Zinc	0.868		0.0800	0.0388	mg/L	4		6020B	Total/NA
Selenium	0.00532		0.00500	0.00140	mg/L	1		6020B	Total/NA
Cobalt	1.13		0.00200	0.000680	mg/L	4		6020B	Total/NA
Total Suspended Solids	2.50		1.88	1.39	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	22.4		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: DW-24

## Lab Sample ID: 310-295795-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	1020		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	24.5		0.0500	0.0210	mg/L	1		6020B	Total/NA
Iron	15.2		0.100	0.0360	mg/L	1		6020B	Total/NA
Cadmium	0.0122		0.000200	0.000100	mg/L	1		6020B	Total/NA
Beryllium	0.00774		0.00100	0.000330	mg/L	1		6020B	Total/NA
Barium	0.0125		0.00200	0.000660	mg/L	1		6020B	Total/NA
Thallium	0.000909	J	0.00100	0.000570	mg/L	1		6020B	Total/NA
Nickel	0.308		0.00500	0.00210	mg/L	1		6020B	Total/NA
Arsenic	0.00131	J	0.00200	0.000530	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Client Sample ID: DW-24 (Continued)

## Lab Sample ID: 310-295795-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Copper	0.00338	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000481	J	0.000500	0.000260	mg/L	1		6020B	Total/NA
Zinc	0.529		0.0200	0.00970	mg/L	1		6020B	Total/NA
Selenium	0.00626		0.00500	0.00140	mg/L	1		6020B	Total/NA
Cobalt	0.264		0.000500	0.000170	mg/L	1		6020B	Total/NA

## Client Sample ID: MW-D

## Lab Sample ID: 310-295795-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	617		100	42.0	mg/L	100		9056A	Total/NA
Aluminum	0.0449	J	0.0500	0.0210	mg/L	1		6020B	Total/NA
Iron	0.0566	J	0.100	0.0360	mg/L	1		6020B	Total/NA
Cadmium	0.000246		0.000200	0.000100	mg/L	1		6020B	Total/NA
Barium	0.0249		0.00200	0.000660	mg/L	1		6020B	Total/NA
Cobalt	0.000229	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Total Suspended Solids	9.25		1.88	1.39	mg/L	1		I-3765-85	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	296		5.00	2.50	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: Trip Blank 1

## Lab Sample ID: 310-295795-9

No Detections.

## Client Sample ID: Trip Blank 2

## Lab Sample ID: 310-295795-10

No Detections.

## Client Sample ID: Trip Blank 3

## Lab Sample ID: 310-295795-11

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls



# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-8**  
**Date Collected: 11/18/24 10:30**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-1**  
**Matrix: Water**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 12:33	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 12:33	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 17:10	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 12:33	1
<b>1,1-Dichloroethane</b>	<b>1.49</b>		1.00	0.220	ug/L			11/23/24 12:33	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 12:33	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 12:33	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 12:33	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 12:33	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 12:33	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 12:33	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 12:33	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 12:33	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 12:33	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 12:33	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 12:33	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 12:33	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 12:33	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 12:33	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 12:33	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 12:33	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 12:33	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 12:33	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 12:33	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 12:33	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 12:33	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 12:33	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 12:33	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 12:33	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 12:33	1
<b>cis-1,2-Dichloroethene</b>	<b>1.29</b>		1.00	0.210	ug/L			11/23/24 12:33	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 12:33	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 12:33	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 12:33	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 12:33	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 12:33	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 12:33	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 12:33	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 12:33	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 12:33	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 12:33	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 12:33	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 12:33	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 12:33	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 12:33	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 12:33	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 12:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	102		73 - 130		11/23/24 12:33	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-8**  
 Date Collected: 11/18/24 10:30  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-1**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	105		73 - 130		11/26/24 17:10	1
Toluene-d8 (Surr)	95		80 - 120		11/23/24 12:33	1
Toluene-d8 (Surr)	97		80 - 120		11/26/24 17:10	1
4-Bromofluorobenzene (Surr)	98		80 - 120		11/23/24 12:33	1
4-Bromofluorobenzene (Surr)	99		80 - 120		11/26/24 17:10	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	378		100	42.0	mg/L			11/27/24 14:19	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	1.38		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 18:36	1
Iron	18.2		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 18:36	1
Cadmium	0.000171	J	0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 18:36	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 18:36	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 18:36	1
Barium	0.0516		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 18:36	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 18:36	1
Nickel	0.00524		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 18:36	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 18:36	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 18:36	1
Arsenic	0.00192	J	0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 18:36	1
Copper	0.00220	J	0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 18:36	1
Lead	0.00370		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 18:36	1
Zinc	0.0154	J	0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 18:36	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 18:36	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 18:36	1
Cobalt	0.00856		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 18:36	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	62.0		3.75	2.78	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	488		5.00	2.50	mg/L			11/22/24 19:06	1

# Client Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: UW-10**

**Lab Sample ID: 310-295795-2**

**Date Collected: 11/20/24 11:02**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 09:54	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 09:54	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 17:33	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 09:54	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 09:54	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 09:54	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 09:54	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 09:54	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 09:54	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 09:54	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 09:54	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 09:54	1
<b>1,4-Dichlorobenzene</b>	<b>5.70</b>		1.00	0.230	ug/L			11/23/24 09:54	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 09:54	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 09:54	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 09:54	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 09:54	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 09:54	1
<b>Benzene</b>	<b>2.00</b>		0.500	0.220	ug/L			11/23/24 09:54	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 09:54	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 09:54	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 09:54	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 09:54	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 09:54	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 09:54	1
<b>Chlorobenzene</b>	<b>0.471 J</b>		1.00	0.400	ug/L			11/23/24 09:54	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 09:54	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 09:54	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 09:54	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 09:54	1
<b>cis-1,2-Dichloroethene</b>	<b>0.835 J</b>		1.00	0.210	ug/L			11/23/24 09:54	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 09:54	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 09:54	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 09:54	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 09:54	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 09:54	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 09:54	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 09:54	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 09:54	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 09:54	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 09:54	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 09:54	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 09:54	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 09:54	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 09:54	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 09:54	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 09:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	105		73 - 130		11/23/24 09:54	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: UW-10**  
 Date Collected: 11/20/24 11:02  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-2**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	104		73 - 130		11/26/24 17:33	1
Toluene-d8 (Surr)	96		80 - 120		11/23/24 09:54	1
Toluene-d8 (Surr)	97		80 - 120		11/26/24 17:33	1
4-Bromofluorobenzene (Surr)	97		80 - 120		11/23/24 09:54	1
4-Bromofluorobenzene (Surr)	99		80 - 120		11/26/24 17:33	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	934		100	42.0	mg/L			11/27/24 14:34	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 18:38	1
Iron	43.1		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 18:38	1
Cadmium	0.000131	J	0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 18:38	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 18:38	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 18:38	1
Barium	0.0216		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 18:38	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 18:38	1
Nickel	<0.00500		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 18:38	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 18:38	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 18:38	1
Arsenic	0.00155	J	0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 18:38	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 18:38	1
Lead	<0.000500		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 18:38	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 18:38	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 18:38	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 18:38	1
Cobalt	0.00831		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 18:38	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	8.75		3.75	2.78	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	636		5.00	2.50	mg/L			11/22/24 19:16	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: UW-11**  
**Date Collected: 11/20/24 12:23**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-3**  
**Matrix: Water**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 12:56	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 12:56	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 19:03	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 12:56	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 12:56	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 12:56	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 12:56	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 12:56	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 12:56	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 12:56	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 12:56	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 12:56	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 12:56	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 12:56	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 12:56	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 12:56	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 12:56	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 12:56	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 12:56	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 12:56	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 12:56	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 12:56	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 12:56	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 12:56	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 12:56	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 12:56	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 12:56	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 12:56	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 12:56	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 12:56	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 12:56	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 12:56	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 12:56	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 12:56	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 12:56	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 12:56	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 12:56	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 12:56	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 12:56	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 12:56	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 12:56	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 12:56	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 12:56	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 12:56	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 12:56	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 12:56	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 12:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	107		73 - 130		11/23/24 12:56	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: UW-11**  
 Date Collected: 11/20/24 12:23  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-3**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		73 - 130		11/26/24 19:03	1
Toluene-d8 (Surr)	95		80 - 120		11/23/24 12:56	1
Toluene-d8 (Surr)	96		80 - 120		11/26/24 19:03	1
4-Bromofluorobenzene (Surr)	101		80 - 120		11/23/24 12:56	1
4-Bromofluorobenzene (Surr)	103		80 - 120		11/26/24 19:03	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1970		100	42.0	mg/L			11/27/24 14:50	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 18:41	1
<b>Iron</b>	<b>30.6</b>		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 18:41	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 18:41	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 18:41	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 18:41	1
<b>Barium</b>	<b>0.0216</b>		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 18:41	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 18:41	1
<b>Nickel</b>	<b>0.00511</b>		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 18:41	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 18:41	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 18:41	1
<b>Arsenic</b>	<b>0.00177 J</b>		0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 18:41	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 18:41	1
Lead	<0.000500		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 18:41	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 18:41	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 18:41	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 18:41	1
<b>Cobalt</b>	<b>0.000618</b>		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 18:41	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	7.38		1.88	1.39	mg/L			11/22/24 13:37	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	532		5.00	2.50	mg/L			11/22/24 19:35	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: PZ-14**  
**Date Collected: 11/20/24 11:48**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-4**  
**Matrix: Water**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 13:19	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 13:19	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 19:26	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 13:19	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 13:19	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 13:19	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 13:19	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 13:19	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 13:19	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 13:19	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 13:19	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 13:19	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 13:19	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 13:19	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 13:19	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 13:19	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 13:19	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 13:19	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 13:19	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 13:19	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 13:19	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 13:19	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 13:19	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 13:19	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 13:19	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 13:19	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 13:19	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 13:19	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 13:19	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 13:19	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 13:19	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 13:19	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 13:19	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 13:19	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 13:19	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 13:19	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 13:19	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 13:19	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 13:19	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 13:19	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 13:19	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 13:19	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 13:19	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 13:19	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 13:19	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 13:19	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 13:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	104		73 - 130		11/23/24 13:19	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: PZ-14**  
 Date Collected: 11/20/24 11:48  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-4**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	108		73 - 130		11/26/24 19:26	1
Toluene-d8 (Surr)	93		80 - 120		11/23/24 13:19	1
Toluene-d8 (Surr)	96		80 - 120		11/26/24 19:26	1
4-Bromofluorobenzene (Surr)	101		80 - 120		11/23/24 13:19	1
4-Bromofluorobenzene (Surr)	97		80 - 120		11/26/24 19:26	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	942		100	42.0	mg/L			11/27/24 15:05	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.737		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 18:44	1
Iron	139		0.400	0.144	mg/L		11/25/24 09:30	11/26/24 12:29	4
Cadmium	<0.000200		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 18:44	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 18:44	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 18:44	1
Barium	0.0435		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 18:44	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 18:44	1
Nickel	0.00647		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 18:44	1
Vanadium	0.00122	J	0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 18:44	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 18:44	1
Arsenic	0.00106	J	0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 18:44	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 18:44	1
Lead	0.000581		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 18:44	1
Zinc	0.0313		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 18:44	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 18:44	1
Chromium	0.00139	J	0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 18:44	1
Cobalt	0.00620		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 18:44	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	60.0		15.0	11.1	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	50.4		5.00	2.50	mg/L			11/22/24 19:47	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-19**

**Lab Sample ID: 310-295795-5**

**Date Collected: 11/18/24 14:57**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 13:41	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 13:41	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 17:55	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 13:41	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 13:41	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 13:41	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 13:41	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 13:41	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 13:41	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 13:41	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 13:41	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 13:41	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 13:41	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 13:41	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 13:41	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 13:41	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 13:41	1
Acrylonitrile	<5.00	H	5.00	2.20	ug/L			11/23/24 13:41	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 13:41	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 13:41	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 13:41	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 13:41	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 13:41	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 13:41	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 13:41	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 13:41	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 13:41	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 13:41	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 13:41	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 13:41	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 13:41	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 13:41	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 13:41	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 13:41	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 13:41	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 13:41	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 13:41	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 13:41	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 13:41	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 13:41	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 13:41	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 13:41	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 13:41	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 13:41	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 13:41	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 13:41	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 13:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	106		73 - 130		11/23/24 13:41	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-19**  
**Date Collected: 11/18/24 14:57**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-5**  
**Matrix: Water**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	107		73 - 130		11/26/24 17:55	1
Toluene-d8 (Surr)	95		80 - 120		11/23/24 13:41	1
Toluene-d8 (Surr)	97		80 - 120		11/26/24 17:55	1
4-Bromofluorobenzene (Surr)	96		80 - 120		11/23/24 13:41	1
4-Bromofluorobenzene (Surr)	100		80 - 120		11/26/24 17:55	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	579		100	42.0	mg/L			11/27/24 15:52	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.176	F1 F2	0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 20:47	1
Iron	0.205	F1 F2	0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 20:47	1
Cadmium	0.000176	J	0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 20:47	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 20:47	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 20:47	1
Barium	0.0255		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 20:47	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 20:47	1
Nickel	<0.00500		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 20:47	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 20:47	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 20:47	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 20:47	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 20:47	1
Lead	0.000261	J	0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 20:47	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 20:47	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 20:47	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 20:47	1
Cobalt	0.000304	J	0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 20:47	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	12.9		1.88	1.39	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	294		5.00	2.50	mg/L			11/22/24 19:54	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-23**

**Lab Sample ID: 310-295795-6**

**Date Collected: 11/20/24 13:01**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 14:04	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 14:04	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/27/24 05:58	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 14:04	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 14:04	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 14:04	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 14:04	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 14:04	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 14:04	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 14:04	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 14:04	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 14:04	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 14:04	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 14:04	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 14:04	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 14:04	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 14:04	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 14:04	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 14:04	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 14:04	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 14:04	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 14:04	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 14:04	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 14:04	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 14:04	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 14:04	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 14:04	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 14:04	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 14:04	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 14:04	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 14:04	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 14:04	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 14:04	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 14:04	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 14:04	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 14:04	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 14:04	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 14:04	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 14:04	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 14:04	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 14:04	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 14:04	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 14:04	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 14:04	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 14:04	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 14:04	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 14:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	107		73 - 130		11/23/24 14:04	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-23**  
 Date Collected: 11/20/24 13:01  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-6**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		73 - 130		11/27/24 05:58	1
Toluene-d8 (Surr)	94		80 - 120		11/23/24 14:04	1
Toluene-d8 (Surr)	95		80 - 120		11/27/24 05:58	1
4-Bromofluorobenzene (Surr)	97		80 - 120		11/23/24 14:04	1
4-Bromofluorobenzene (Surr)	103		80 - 120		11/27/24 05:58	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	3880		100	42.0	mg/L			11/27/24 16:08	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	4.74		0.200	0.0840	mg/L		11/25/24 09:30	11/26/24 13:41	4
Iron	60.7		0.400	0.144	mg/L		11/25/24 09:30	11/26/24 13:41	4
Cadmium	0.00512		0.000800	0.000400	mg/L		11/25/24 09:30	11/26/24 13:41	4
Antimony	<0.00800		0.00800	0.00400	mg/L		11/25/24 09:30	01/20/25 11:21	4
Beryllium	0.00264	J	0.00400	0.00132	mg/L		11/25/24 09:30	11/26/24 13:41	4
Barium	0.0133		0.00800	0.00264	mg/L		11/25/24 09:30	11/26/24 13:41	4
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 21:01	1
Nickel	1.33		0.0200	0.00840	mg/L		11/25/24 09:30	11/26/24 13:41	4
Vanadium	<0.0200		0.0200	0.00440	mg/L		11/25/24 09:30	11/26/24 13:41	4
Silver	0.00413		0.00400	0.00200	mg/L		11/25/24 09:30	11/26/24 13:41	4
Arsenic	<0.00800		0.00800	0.00212	mg/L		11/25/24 09:30	11/26/24 13:41	4
Copper	<0.0200		0.0200	0.00720	mg/L		11/25/24 09:30	11/26/24 13:41	4
Lead	0.000736		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 21:01	1
Zinc	0.868		0.0800	0.0388	mg/L		11/25/24 09:30	11/26/24 13:41	4
Selenium	0.00532		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 21:01	1
Chromium	<0.0200		0.0200	0.00480	mg/L		11/25/24 09:30	11/26/24 13:41	4
Cobalt	1.13		0.00200	0.000680	mg/L		11/25/24 09:30	11/26/24 13:41	4

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	2.50		1.88	1.39	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	22.4		5.00	2.50	mg/L			11/22/24 20:17	1

# Client Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-24**

**Lab Sample ID: 310-295795-7**

**Date Collected: 11/18/24 13:39**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 14:27	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 14:27	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 18:18	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 14:27	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 14:27	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 14:27	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 14:27	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 14:27	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 14:27	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 14:27	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 14:27	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 14:27	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 14:27	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 14:27	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 14:27	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 14:27	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 14:27	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 14:27	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 14:27	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 14:27	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 14:27	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 14:27	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 14:27	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 14:27	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 14:27	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 14:27	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 14:27	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 14:27	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 14:27	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 14:27	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 14:27	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 14:27	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 14:27	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 14:27	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 14:27	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 14:27	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 14:27	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 14:27	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 14:27	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 14:27	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 14:27	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 14:27	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 14:27	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 14:27	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 14:27	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 14:27	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 14:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	106		73 - 130		11/23/24 14:27	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-24**  
 Date Collected: 11/18/24 13:39  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-7**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	106		73 - 130		11/26/24 18:18	1
Toluene-d8 (Surr)	93		80 - 120		11/23/24 14:27	1
Toluene-d8 (Surr)	96		80 - 120		11/26/24 18:18	1
4-Bromofluorobenzene (Surr)	98		80 - 120		11/23/24 14:27	1
4-Bromofluorobenzene (Surr)	100		80 - 120		11/26/24 18:18	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1020		100	42.0	mg/L			11/27/24 16:23	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	24.5		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 21:04	1
Iron	15.2		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 21:04	1
Cadmium	0.0122		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 21:04	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 21:04	1
Beryllium	0.00774		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 21:04	1
Barium	0.0125		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 21:04	1
Thallium	0.000909	J	0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 21:04	1
Nickel	0.308		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 21:04	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 21:04	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 21:04	1
Arsenic	0.00131	J	0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 21:04	1
Copper	0.00338	J	0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 21:04	1
Lead	0.000481	J	0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 21:04	1
Zinc	0.529		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 21:04	1
Selenium	0.00626		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 21:04	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 21:04	1
Cobalt	0.264		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 21:04	1

**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			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	<5.00		5.00	2.50	mg/L			11/22/24 20:13	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: MW-D**

**Lab Sample ID: 310-295795-8**

**Date Collected: 11/18/24 14:57**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 14:50	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 14:50	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 18:41	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 14:50	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 14:50	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 14:50	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 14:50	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 14:50	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 14:50	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 14:50	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 14:50	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 14:50	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 14:50	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 14:50	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 14:50	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 14:50	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 14:50	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 14:50	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 14:50	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 14:50	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 14:50	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 14:50	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 14:50	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 14:50	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 14:50	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 14:50	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 14:50	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 14:50	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 14:50	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 14:50	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 14:50	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 14:50	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 14:50	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 14:50	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 14:50	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 14:50	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 14:50	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 14:50	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 14:50	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 14:50	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 14:50	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 14:50	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 14:50	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 14:50	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 14:50	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 14:50	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 14:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	104		73 - 130		11/23/24 14:50	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: MW-D**  
 Date Collected: 11/18/24 14:57  
 Date Received: 11/21/24 16:25

**Lab Sample ID: 310-295795-8**  
 Matrix: Water

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		73 - 130		11/26/24 18:41	1
Toluene-d8 (Surr)	94		80 - 120		11/23/24 14:50	1
Toluene-d8 (Surr)	96		80 - 120		11/26/24 18:41	1
4-Bromofluorobenzene (Surr)	100		80 - 120		11/23/24 14:50	1
4-Bromofluorobenzene (Surr)	97		80 - 120		11/26/24 18:41	1

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	617		100	42.0	mg/L			11/27/24 16:39	100

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.0449	J	0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 21:18	1
Iron	0.0566	J	0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 21:18	1
Cadmium	0.000246		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 21:18	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 21:18	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 21:18	1
Barium	0.0249		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 21:18	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 21:18	1
Nickel	<0.00500		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 21:18	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 21:18	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 21:18	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 21:18	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 21:18	1
Lead	<0.000500		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 21:18	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 21:18	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 21:18	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 21:18	1
Cobalt	0.000229	J	0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 21:18	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	9.25		1.88	1.39	mg/L			11/22/24 13:06	1
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	296		5.00	2.50	mg/L			11/22/24 20:04	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 1**

**Lab Sample ID: 310-295795-9**

**Date Collected: 11/18/24 00:00**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 08:46	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 08:46	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 12:39	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 08:46	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 08:46	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 08:46	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 08:46	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 08:46	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 08:46	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 08:46	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 08:46	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 08:46	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 08:46	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 08:46	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 08:46	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 08:46	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 08:46	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 08:46	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 08:46	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 08:46	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 08:46	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 08:46	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 08:46	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 08:46	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 08:46	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 08:46	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 08:46	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 08:46	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 08:46	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 08:46	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 08:46	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 08:46	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 08:46	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 08:46	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 08:46	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 08:46	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 08:46	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 08:46	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 08:46	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 08:46	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 08:46	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 08:46	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 08:46	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 08:46	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 08:46	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 08:46	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 08:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		73 - 130		11/23/24 08:46	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 1**

**Lab Sample ID: 310-295795-9**

Date Collected: 11/18/24 00:00

Matrix: Water

Date Received: 11/21/24 16:25

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Dibromofluoromethane (Surr)	102		73 - 130		11/26/24 12:39	1
Toluene-d8 (Surr)	94		80 - 120		11/23/24 08:46	1
Toluene-d8 (Surr)	98		80 - 120		11/26/24 12:39	1
4-Bromofluorobenzene (Surr)	96		80 - 120		11/23/24 08:46	1
4-Bromofluorobenzene (Surr)	102		80 - 120		11/26/24 12:39	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 2**

**Lab Sample ID: 310-295795-10**

Date Collected: 11/18/24 00:00

Matrix: Water

Date Received: 11/21/24 16:25

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 09:09	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 09:09	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 13:02	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 09:09	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 09:09	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 09:09	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 09:09	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 09:09	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 09:09	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 09:09	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 09:09	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 09:09	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 09:09	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 09:09	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 09:09	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 09:09	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 09:09	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 09:09	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 09:09	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 09:09	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 09:09	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 09:09	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 09:09	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 09:09	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 09:09	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 09:09	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 09:09	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 09:09	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 09:09	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 09:09	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 09:09	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 09:09	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 09:09	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 09:09	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 09:09	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 09:09	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 09:09	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 09:09	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 09:09	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 09:09	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 09:09	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 09:09	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 09:09	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 09:09	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 09:09	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 09:09	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 09:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	103		73 - 130		11/23/24 09:09	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 2**

**Lab Sample ID: 310-295795-10**

**Date Collected: 11/18/24 00:00**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Dibromofluoromethane (Surr)</i>	104		73 - 130		11/26/24 13:02	1
<i>Toluene-d8 (Surr)</i>	96		80 - 120		11/23/24 09:09	1
<i>Toluene-d8 (Surr)</i>	95		80 - 120		11/26/24 13:02	1
<i>4-Bromofluorobenzene (Surr)</i>	96		80 - 120		11/23/24 09:09	1
<i>4-Bromofluorobenzene (Surr)</i>	98		80 - 120		11/26/24 13:02	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 3**

**Lab Sample ID: 310-295795-11**

**Date Collected: 11/18/24 00:00**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/22/24 21:52	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/22/24 21:52	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 13:24	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/22/24 21:52	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/22/24 21:52	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/22/24 21:52	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/22/24 21:52	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/22/24 21:52	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/22/24 21:52	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/22/24 21:52	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/22/24 21:52	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/22/24 21:52	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/22/24 21:52	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/22/24 21:52	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/22/24 21:52	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/22/24 21:52	1
Acetone	<10.0		10.0	3.10	ug/L			11/22/24 21:52	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/22/24 21:52	1
Benzene	<0.500		0.500	0.220	ug/L			11/22/24 21:52	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/22/24 21:52	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/22/24 21:52	1
Bromoform	<5.00		5.00	0.780	ug/L			11/22/24 21:52	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/22/24 21:52	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/22/24 21:52	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/22/24 21:52	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/22/24 21:52	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/22/24 21:52	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/22/24 21:52	1
Chloroform	<3.00		3.00	1.30	ug/L			11/22/24 21:52	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/22/24 21:52	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/22/24 21:52	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/22/24 21:52	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/22/24 21:52	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/22/24 21:52	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/22/24 21:52	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/22/24 21:52	1
Styrene	<1.00		1.00	0.370	ug/L			11/22/24 21:52	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/22/24 21:52	1
Toluene	<1.00		1.00	0.430	ug/L			11/22/24 21:52	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/22/24 21:52	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/22/24 21:52	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/22/24 21:52	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/22/24 21:52	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/22/24 21:52	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/22/24 21:52	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/22/24 21:52	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/22/24 21:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	99		73 - 130		11/22/24 21:52	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: Trip Blank 3**

**Lab Sample ID: 310-295795-11**

**Date Collected: 11/18/24 00:00**

**Matrix: Water**

**Date Received: 11/21/24 16:25**

**Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)**

<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Dibromofluoromethane (Surr)</i>	104		73 - 130		11/26/24 13:24	1
<i>Toluene-d8 (Surr)</i>	96		80 - 120		11/22/24 21:52	1
<i>Toluene-d8 (Surr)</i>	97		80 - 120		11/26/24 13:24	1
<i>4-Bromofluorobenzene (Surr)</i>	99		80 - 120		11/22/24 21:52	1
<i>4-Bromofluorobenzene (Surr)</i>	99		80 - 120		11/26/24 13:24	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
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
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
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

# Surrogate Summary

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Method: 8260D - Volatile Organic Compounds by GC/MS**

**Matrix: Water**

**Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		DBFM (73-130)	TOL (80-120)	BFB (80-120)
310-295795-1	DW-8	102	95	98
310-295795-1	DW-8	105	97	99
310-295795-2	UW-10	105	96	97
310-295795-2	UW-10	104	97	99
310-295795-2 MS	UW-10	100	99	99
310-295795-2 MSD	UW-10	98	100	99
310-295795-3	UW-11	107	95	101
310-295795-3	UW-11	103	96	103
310-295795-4	PZ-14	104	93	101
310-295795-4	PZ-14	108	96	97
310-295795-5	DW-19	106	95	96
310-295795-5	DW-19	107	97	100
310-295795-6	DW-23	107	94	97
310-295795-6	DW-23	103	95	103
310-295795-7	DW-24	106	93	98
310-295795-7	DW-24	106	96	100
310-295795-8	MW-D	104	94	100
310-295795-8	MW-D	103	96	97
310-295795-9	Trip Blank 1	103	94	96
310-295795-9	Trip Blank 1	102	98	102
310-295795-10	Trip Blank 2	103	96	96
310-295795-10	Trip Blank 2	104	95	98
310-295795-11	Trip Blank 3	99	96	99
310-295795-11	Trip Blank 3	104	97	99
LCS 310-440638/6	Lab Control Sample	97	100	102
LCS 310-440638/7	Lab Control Sample	103	97	100
LCS 310-440646/6	Lab Control Sample	100	100	99
LCS 310-440646/7	Lab Control Sample	104	98	97
LCS 310-440950/6	Lab Control Sample	100	100	101
LCS 310-440950/7	Lab Control Sample	105	98	102
LCS 310-441013/6	Lab Control Sample	99	102	99
LCS 310-441013/7	Lab Control Sample	101	98	104
MB 310-440638/5	Method Blank	99	96	98
MB 310-440646/5	Method Blank	105	96	100
MB 310-440950/5	Method Blank	102	96	100
MB 310-441013/5	Method Blank	102	96	99

**Surrogate Legend**

DBFM = Dibromofluoromethane (Surr)  
 TOL = Toluene-d8 (Surr)  
 BFB = 4-Bromofluorobenzene (Surr)



# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS

**Lab Sample ID: MB 310-440638/5**  
**Matrix: Water**  
**Analysis Batch: 440638**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/22/24 20:44	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/22/24 20:44	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/22/24 20:44	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/22/24 20:44	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/22/24 20:44	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/22/24 20:44	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/22/24 20:44	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/22/24 20:44	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/22/24 20:44	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/22/24 20:44	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/22/24 20:44	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/22/24 20:44	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/22/24 20:44	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/22/24 20:44	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/22/24 20:44	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/22/24 20:44	1
Acetone	<10.0		10.0	3.10	ug/L			11/22/24 20:44	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/22/24 20:44	1
Benzene	<0.500		0.500	0.220	ug/L			11/22/24 20:44	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/22/24 20:44	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/22/24 20:44	1
Bromoform	<5.00		5.00	0.780	ug/L			11/22/24 20:44	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/22/24 20:44	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/22/24 20:44	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/22/24 20:44	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/22/24 20:44	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/22/24 20:44	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/22/24 20:44	1
Chloroform	<3.00		3.00	1.30	ug/L			11/22/24 20:44	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/22/24 20:44	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/22/24 20:44	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/22/24 20:44	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/22/24 20:44	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/22/24 20:44	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/22/24 20:44	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/22/24 20:44	1
Styrene	<1.00		1.00	0.370	ug/L			11/22/24 20:44	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/22/24 20:44	1
Toluene	<1.00		1.00	0.430	ug/L			11/22/24 20:44	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/22/24 20:44	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/22/24 20:44	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/22/24 20:44	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/22/24 20:44	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/22/24 20:44	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/22/24 20:44	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/22/24 20:44	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/22/24 20:44	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-440638/5**  
**Matrix: Water**  
**Analysis Batch: 440638**

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

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Dibromofluoromethane (Surr)	99	MB MB	73 - 130		11/22/24 20:44	1
Toluene-d8 (Surr)	96		80 - 120		11/22/24 20:44	1
4-Bromofluorobenzene (Surr)	98		80 - 120		11/22/24 20:44	1

**Lab Sample ID: LCS 310-440638/6**  
**Matrix: Water**  
**Analysis Batch: 440638**

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

<u>Analyte</u>	<u>Spike Added</u>	<u>LCS Result</u>	<u>LCS Qualifier</u>	<u>Unit</u>	<u>D</u>	<u>%Rec</u>	<u>%Rec Limits</u>
1,1,1,2-Tetrachloroethane	20.0	20.30		ug/L		102	71 - 120
1,1,1-Trichloroethane	20.0	22.45		ug/L		112	73 - 129
1,1,2-Trichloroethane	20.0	19.89		ug/L		99	73 - 123
1,1-Dichloroethane	20.0	20.67		ug/L		103	70 - 127
1,1-Dichloroethene	20.0	21.37		ug/L		107	63 - 132
1,2,3-Trichloropropane	20.0	18.45		ug/L		92	65 - 127
1,2-Dibromo-3-chloropropane	20.0	17.93		ug/L		90	50 - 150
1,2-Dibromoethane (EDB)	20.0	19.29		ug/L		96	75 - 125
1,2-Dichlorobenzene	20.0	19.60		ug/L		98	74 - 120
1,2-Dichloroethane	20.0	19.80		ug/L		99	71 - 125
1,2-Dichloropropane	20.0	21.44		ug/L		107	73 - 124
1,4-Dichlorobenzene	20.0	19.47		ug/L		97	72 - 120
2-Butanone (MEK)	40.0	34.13		ug/L		85	50 - 150
2-Hexanone	40.0	36.01		ug/L		90	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	36.29		ug/L		91	60 - 139
Acetone	40.0	37.69		ug/L		94	50 - 150
Acrylonitrile	200	188.5		ug/L		94	50 - 150
Benzene	20.0	20.38		ug/L		102	72 - 124
Bromochloromethane	20.0	19.63		ug/L		98	73 - 130
Bromodichloromethane	20.0	20.00		ug/L		100	74 - 122
Bromoform	20.0	17.02		ug/L		85	61 - 122
Carbon disulfide	20.0	18.02		ug/L		90	59 - 135
Carbon tetrachloride	20.0	21.15		ug/L		106	67 - 132
Chlorobenzene	20.0	19.24		ug/L		96	76 - 120
Chlorodibromomethane	20.0	19.50		ug/L		98	71 - 121
Chloroform	20.0	20.71		ug/L		104	72 - 125
cis-1,2-Dichloroethene	20.0	19.86		ug/L		99	74 - 123
cis-1,3-Dichloropropene	20.0	20.59		ug/L		103	71 - 125
Dibromomethane	20.0	18.88		ug/L		94	74 - 125
Ethylbenzene	20.0	20.18		ug/L		101	74 - 122
Iodomethane	20.0	19.44		ug/L		97	10 - 150
Methylene chloride	20.0	20.55		ug/L		103	50 - 150
Styrene	20.0	20.22		ug/L		101	74 - 121
Tetrachloroethene	20.0	20.74		ug/L		104	71 - 130
Toluene	20.0	19.55		ug/L		98	74 - 123
trans-1,2-Dichloroethene	20.0	19.99		ug/L		100	70 - 126
trans-1,3-Dichloropropene	20.0	18.06		ug/L		90	69 - 123
trans-1,4-Dichloro-2-butene	20.0	16.67		ug/L		83	50 - 150
Trichloroethene	20.0	23.44		ug/L		117	72 - 126

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-440638/6**  
**Matrix: Water**  
**Analysis Batch: 440638**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl acetate	40.0	33.64		ug/L		84	50 - 150
Xylenes, Total	40.0	39.33		ug/L		98	73 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	97		73 - 130
Toluene-d8 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	102		80 - 120

**Lab Sample ID: LCS 310-440638/7**  
**Matrix: Water**  
**Analysis Batch: 440638**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	17.58		ug/L		88	23 - 150
Chloroethane	20.0	19.82		ug/L		99	54 - 136
Chloromethane	20.0	19.74		ug/L		99	38 - 150
Trichlorofluoromethane	20.0	19.62		ug/L		98	54 - 149
Vinyl chloride	20.0	20.09		ug/L		100	56 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	103		73 - 130
Toluene-d8 (Surr)	97		80 - 120
4-Bromofluorobenzene (Surr)	100		80 - 120

**Lab Sample ID: MB 310-440646/5**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/23/24 07:38	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/23/24 07:38	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/23/24 07:38	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/23/24 07:38	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/23/24 07:38	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/23/24 07:38	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/23/24 07:38	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/23/24 07:38	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/23/24 07:38	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/23/24 07:38	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/23/24 07:38	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/23/24 07:38	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/23/24 07:38	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/23/24 07:38	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/23/24 07:38	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/23/24 07:38	1
Acetone	<10.0		10.0	3.10	ug/L			11/23/24 07:38	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/23/24 07:38	1
Benzene	<0.500		0.500	0.220	ug/L			11/23/24 07:38	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-440646/5**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/23/24 07:38	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/23/24 07:38	1
Bromoform	<5.00		5.00	0.780	ug/L			11/23/24 07:38	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/23/24 07:38	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/23/24 07:38	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/23/24 07:38	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/23/24 07:38	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/23/24 07:38	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/23/24 07:38	1
Chloroform	<3.00		3.00	1.30	ug/L			11/23/24 07:38	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/23/24 07:38	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/23/24 07:38	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/23/24 07:38	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/23/24 07:38	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/23/24 07:38	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/23/24 07:38	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/23/24 07:38	1
Styrene	<1.00		1.00	0.370	ug/L			11/23/24 07:38	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/23/24 07:38	1
Toluene	<1.00		1.00	0.430	ug/L			11/23/24 07:38	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/23/24 07:38	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/23/24 07:38	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/23/24 07:38	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/23/24 07:38	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/23/24 07:38	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/23/24 07:38	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/23/24 07:38	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/23/24 07:38	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Dibromofluoromethane (Surr)</i>	105		73 - 130		11/23/24 07:38	1
<i>Toluene-d8 (Surr)</i>	96		80 - 120		11/23/24 07:38	1
<i>4-Bromofluorobenzene (Surr)</i>	100		80 - 120		11/23/24 07:38	1

**Lab Sample ID: LCS 310-440646/6**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	20.0	19.38		ug/L		97	71 - 120
1,1,1-Trichloroethane	20.0	21.39		ug/L		107	73 - 129
1,1,2-Trichloroethane	20.0	19.32		ug/L		97	73 - 123
1,1-Dichloroethane	20.0	19.61		ug/L		98	70 - 127
1,1-Dichloroethene	20.0	20.24		ug/L		101	63 - 132
1,2,3-Trichloropropane	20.0	17.55		ug/L		88	65 - 127
1,2-Dibromo-3-chloropropane	20.0	16.90		ug/L		84	50 - 150
1,2-Dibromoethane (EDB)	20.0	19.00		ug/L		95	75 - 125
1,2-Dichlorobenzene	20.0	18.31		ug/L		92	74 - 120

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# QC Sample Results

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-440646/6**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dichloroethane	20.0	19.68		ug/L		98	71 - 125
1,2-Dichloropropane	20.0	20.74		ug/L		104	73 - 124
1,4-Dichlorobenzene	20.0	18.30		ug/L		92	72 - 120
2-Butanone (MEK)	40.0	34.62		ug/L		87	50 - 150
2-Hexanone	40.0	34.78		ug/L		87	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	34.84		ug/L		87	60 - 139
Acetone	40.0	32.64		ug/L		82	50 - 150
Acrylonitrile	200	183.1		ug/L		92	50 - 150
Benzene	20.0	19.61		ug/L		98	72 - 124
Bromochloromethane	20.0	19.20		ug/L		96	73 - 130
Bromodichloromethane	20.0	19.84		ug/L		99	74 - 122
Bromoform	20.0	16.28		ug/L		81	61 - 122
Carbon disulfide	20.0	17.46		ug/L		87	59 - 135
Carbon tetrachloride	20.0	21.14		ug/L		106	67 - 132
Chlorobenzene	20.0	18.39		ug/L		92	76 - 120
Chlorodibromomethane	20.0	19.05		ug/L		95	71 - 121
Chloroform	20.0	20.43		ug/L		102	72 - 125
cis-1,2-Dichloroethene	20.0	19.61		ug/L		98	74 - 123
cis-1,3-Dichloropropene	20.0	19.49		ug/L		97	71 - 125
Dibromomethane	20.0	18.85		ug/L		94	74 - 125
Ethylbenzene	20.0	19.00		ug/L		95	74 - 122
Iodomethane	20.0	19.37		ug/L		97	10 - 150
Methylene chloride	20.0	19.69		ug/L		98	50 - 150
Styrene	20.0	19.22		ug/L		96	74 - 121
Tetrachloroethene	20.0	19.79		ug/L		99	71 - 130
Toluene	20.0	18.70		ug/L		93	74 - 123
trans-1,2-Dichloroethene	20.0	19.04		ug/L		95	70 - 126
trans-1,3-Dichloropropene	20.0	17.26		ug/L		86	69 - 123
trans-1,4-Dichloro-2-butene	20.0	15.20		ug/L		76	50 - 150
Trichloroethene	20.0	22.40		ug/L		112	72 - 126
Vinyl acetate	40.0	31.28		ug/L		78	50 - 150
Xylenes, Total	40.0	37.57		ug/L		94	73 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	100		73 - 130
Toluene-d8 (Surr)	100		80 - 120
4-Bromofluorobenzene (Surr)	99		80 - 120

**Lab Sample ID: LCS 310-440646/7**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	17.35		ug/L		87	23 - 150
Chloroethane	20.0	19.41		ug/L		97	54 - 136
Chloromethane	20.0	19.54		ug/L		98	38 - 150
Trichlorofluoromethane	20.0	18.29		ug/L		91	54 - 149
Vinyl chloride	20.0	19.42		ug/L		97	56 - 140

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-440646/7**  
**Matrix: Water**  
**Analysis Batch: 440646**

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

<i>Surrogate</i>	<i>LCS %Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
<i>Dibromofluoromethane (Surr)</i>	104		73 - 130
<i>Toluene-d8 (Surr)</i>	98		80 - 120
<i>4-Bromofluorobenzene (Surr)</i>	97		80 - 120

**Lab Sample ID: 310-295795-2 MS**  
**Matrix: Water**  
**Analysis Batch: 440646**

**Client Sample ID: UW-10**  
**Prep Type: Total/NA**

<b>Analyte</b>	<b>Sample Result</b>	<b>Sample Qualifier</b>	<b>Spike Added</b>	<b>MS Result</b>	<b>MS Qualifier</b>	<b>Unit</b>	<b>D</b>	<b>%Rec</b>	<b>%Rec Limits</b>
1,1,1,2-Tetrachloroethane	<1.00		25.0	23.77		ug/L		95	55 - 130
1,1,1-Trichloroethane	<1.00		25.0	23.94		ug/L		96	52 - 130
1,1,2,2-Tetrachloroethane	<1.00	*-	25.0	19.46		ug/L		78	54 - 130
1,1,2-Trichloroethane	<1.00		25.0	23.64		ug/L		95	58 - 130
1,1-Dichloroethane	<1.00		25.0	23.14		ug/L		93	49 - 130
1,1-Dichloroethene	<2.00		25.0	23.78		ug/L		95	37 - 132
1,2,3-Trichloropropane	<1.00		25.0	22.92		ug/L		92	49 - 130
1,2-Dibromo-3-chloropropane	<5.00		25.0	22.42		ug/L		90	38 - 150
1,2-Dibromoethane (EDB)	<1.00		25.0	22.42		ug/L		90	60 - 130
1,2-Dichlorobenzene	<1.00		25.0	22.91		ug/L		92	59 - 130
1,2-Dichloroethane	<1.00		25.0	23.71		ug/L		95	51 - 130
1,2-Dichloropropane	<1.00		25.0	23.98		ug/L		96	57 - 130
1,4-Dichlorobenzene	5.70		25.0	27.60		ug/L		88	57 - 130
2-Butanone (MEK)	<10.0		50.0	42.79		ug/L		86	38 - 150
2-Hexanone	<10.0		50.0	46.18		ug/L		92	46 - 140
4-Methyl-2-pentanone (MIBK)	<10.0		50.0	44.24		ug/L		88	47 - 139
Acetone	<10.0		50.0	44.28		ug/L		89	31 - 150
Acrylonitrile	<5.00		25.0	218.9		ug/L		88	40 - 150
Benzene	2.00		25.0	24.78		ug/L		91	46 - 130
Bromochloromethane	<5.00		25.0	22.55		ug/L		90	57 - 130
Bromodichloromethane	<1.00		25.0	23.38		ug/L		94	57 - 130
Bromoform	<5.00		25.0	20.18		ug/L		81	44 - 130
Carbon disulfide	<1.00		25.0	23.19		ug/L		93	38 - 135
Carbon tetrachloride	<2.00		25.0	24.16		ug/L		97	45 - 132
Chlorobenzene	0.471	J	25.0	22.00		ug/L		86	59 - 130
Chlorodibromomethane	<5.00		25.0	23.42		ug/L		94	54 - 130
Chloroform	<3.00		25.0	23.13		ug/L		93	51 - 130
cis-1,2-Dichloroethene	0.835	J	25.0	23.07		ug/L		89	45 - 130
cis-1,3-Dichloropropene	<5.00		25.0	22.48		ug/L		90	53 - 130
Dibromomethane	<1.00		25.0	21.53		ug/L		86	59 - 130
Ethylbenzene	<1.00		25.0	22.27		ug/L		89	45 - 130
Iodomethane	<10.0		25.0	22.69		ug/L		91	10 - 150
Methylene chloride	<5.00		25.0	22.70		ug/L		91	37 - 150
Styrene	<1.00		25.0	22.78		ug/L		91	47 - 130
Tetrachloroethene	<1.00		25.0	23.24		ug/L		93	47 - 130
Toluene	<1.00		25.0	23.19		ug/L		93	51 - 130
trans-1,2-Dichloroethene	<1.00		25.0	23.00		ug/L		92	48 - 130
trans-1,3-Dichloropropene	<5.00		25.0	19.32		ug/L		77	50 - 130
trans-1,4-Dichloro-2-butene	<10.0		25.0	17.74		ug/L		71	26 - 150

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-295795-2 MS**  
**Matrix: Water**  
**Analysis Batch: 440646**

**Client Sample ID: UW-10**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	<1.00		25.0	24.19		ug/L		97	51 - 130
Vinyl acetate	<10.0		50.0	34.47		ug/L		69	29 - 150
Xylenes, Total	<3.00		50.0	46.39		ug/L		93	43 - 130
<b>MS MS</b>									
Surrogate	%Recovery	Qualifier	Limits						
Dibromofluoromethane (Surr)	100		73 - 130						
Toluene-d8 (Surr)	99		80 - 120						
4-Bromofluorobenzene (Surr)	99		80 - 120						

**Lab Sample ID: 310-295795-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 440646**

**Client Sample ID: UW-10**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	<1.00		25.0	23.45		ug/L		94	55 - 130	1	20
1,1,1-Trichloroethane	<1.00		25.0	23.65		ug/L		95	52 - 130	1	20
1,1,2,2-Tetrachloroethane	<1.00	*-	25.0	20.10		ug/L		80	54 - 130	3	20
1,1,2-Trichloroethane	<1.00		25.0	23.28		ug/L		93	58 - 130	2	20
1,1-Dichloroethane	<1.00		25.0	22.63		ug/L		91	49 - 130	2	20
1,1-Dichloroethene	<2.00		25.0	23.72		ug/L		95	37 - 132	0	26
1,2,3-Trichloropropane	<1.00		25.0	23.09		ug/L		92	49 - 130	1	26
1,2-Dibromo-3-chloropropane	<5.00		25.0	23.57		ug/L		94	38 - 150	5	20
1,2-Dibromoethane (EDB)	<1.00		25.0	22.26		ug/L		89	60 - 130	1	20
1,2-Dichlorobenzene	<1.00		25.0	23.50		ug/L		94	59 - 130	3	20
1,2-Dichloroethane	<1.00		25.0	22.55		ug/L		90	51 - 130	5	20
1,2-Dichloropropane	<1.00		25.0	23.39		ug/L		94	57 - 130	2	20
1,4-Dichlorobenzene	5.70		25.0	27.73		ug/L		88	57 - 130	0	20
2-Butanone (MEK)	<10.0		50.0	41.43		ug/L		83	38 - 150	3	20
2-Hexanone	<10.0		50.0	46.88		ug/L		94	46 - 140	1	20
4-Methyl-2-pentanone (MIBK)	<10.0		50.0	45.33		ug/L		91	47 - 139	2	20
Acetone	<10.0		50.0	50.79		ug/L		102	31 - 150	14	29
Acrylonitrile	<5.00		25.0	219.6		ug/L		88	40 - 150	0	20
Benzene	2.00		25.0	24.09		ug/L		88	46 - 130	3	20
Bromochloromethane	<5.00		25.0	21.68		ug/L		87	57 - 130	4	20
Bromodichloromethane	<1.00		25.0	22.73		ug/L		91	57 - 130	3	20
Bromoform	<5.00		25.0	20.28		ug/L		81	44 - 130	0	20
Carbon disulfide	<1.00		25.0	21.83		ug/L		87	38 - 135	6	30
Carbon tetrachloride	<2.00		25.0	24.35		ug/L		97	45 - 132	1	20
Chlorobenzene	0.471	J	25.0	21.65		ug/L		85	59 - 130	2	20
Chlorodibromomethane	<5.00		25.0	23.46		ug/L		94	54 - 130	0	20
Chloroform	<3.00		25.0	22.94		ug/L		92	51 - 130	1	20
cis-1,2-Dichloroethene	0.835	J	25.0	22.55		ug/L		87	45 - 130	2	20
cis-1,3-Dichloropropene	<5.00		25.0	22.04		ug/L		88	53 - 130	2	20
Dibromomethane	<1.00		25.0	21.79		ug/L		87	59 - 130	1	20
Ethylbenzene	<1.00		25.0	22.20		ug/L		89	45 - 130	0	20
Iodomethane	<10.0		25.0	23.50		ug/L		94	10 - 150	4	35
Methylene chloride	<5.00		25.0	22.04		ug/L		88	37 - 150	3	24
Styrene	<1.00		25.0	22.27		ug/L		89	47 - 130	2	20

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: 310-295795-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 440646**

**Client Sample ID: UW-10**  
**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
Tetrachloroethene	<1.00		25.0	23.01		ug/L		92	47 - 130	1	20
Toluene	<1.00		25.0	21.60		ug/L		86	51 - 130	7	20
trans-1,2-Dichloroethene	<1.00		25.0	22.59		ug/L		90	48 - 130	2	22
trans-1,3-Dichloropropene	<5.00		25.0	19.41		ug/L		78	50 - 130	0	20
trans-1,4-Dichloro-2-butene	<10.0		25.0	18.85		ug/L		75	26 - 150	6	23
Trichloroethene	<1.00		25.0	24.05		ug/L		96	51 - 130	1	20
Vinyl acetate	<10.0		50.0	37.73		ug/L		75	29 - 150	9	23
Xylenes, Total	<3.00		50.0	44.12		ug/L		88	43 - 130	5	20
<b>MSD MSD</b>											
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>								
Dibromofluoromethane (Surr)	98		73 - 130								
Toluene-d8 (Surr)	100		80 - 120								
4-Bromofluorobenzene (Surr)	99		80 - 120								

**Lab Sample ID: MB 310-440950/5**  
**Matrix: Water**  
**Analysis Batch: 440950**

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/26/24 10:57	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/26/24 10:57	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 10:57	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/26/24 10:57	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/26/24 10:57	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/26/24 10:57	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/26/24 10:57	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/26/24 10:57	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/26/24 10:57	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/26/24 10:57	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/26/24 10:57	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/26/24 10:57	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/26/24 10:57	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/26/24 10:57	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/26/24 10:57	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/26/24 10:57	1
Acetone	<10.0		10.0	3.10	ug/L			11/26/24 10:57	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/26/24 10:57	1
Benzene	<0.500		0.500	0.220	ug/L			11/26/24 10:57	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/26/24 10:57	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/26/24 10:57	1
Bromoform	<5.00		5.00	0.780	ug/L			11/26/24 10:57	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/26/24 10:57	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/26/24 10:57	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/26/24 10:57	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/26/24 10:57	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/26/24 10:57	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/26/24 10:57	1
Chloroform	<3.00		3.00	1.30	ug/L			11/26/24 10:57	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-440950/5**  
**Matrix: Water**  
**Analysis Batch: 440950**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloromethane	<3.00		3.00	0.610	ug/L			11/26/24 10:57	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/26/24 10:57	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/26/24 10:57	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/26/24 10:57	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/26/24 10:57	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/26/24 10:57	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/26/24 10:57	1
Styrene	<1.00		1.00	0.370	ug/L			11/26/24 10:57	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/26/24 10:57	1
Toluene	<1.00		1.00	0.430	ug/L			11/26/24 10:57	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/26/24 10:57	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/26/24 10:57	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/26/24 10:57	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/26/24 10:57	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/26/24 10:57	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/26/24 10:57	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/26/24 10:57	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/26/24 10:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>Dibromofluoromethane (Surr)</i>	102		73 - 130		11/26/24 10:57	1
<i>Toluene-d8 (Surr)</i>	96		80 - 120		11/26/24 10:57	1
<i>4-Bromofluorobenzene (Surr)</i>	100		80 - 120		11/26/24 10:57	1

**Lab Sample ID: LCS 310-440950/6**  
**Matrix: Water**  
**Analysis Batch: 440950**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	20.0	18.65		ug/L		93	71 - 120
1,1,1-Trichloroethane	20.0	18.77		ug/L		94	73 - 129
1,1,2,2-Tetrachloroethane	20.0	18.20		ug/L		91	68 - 124
1,1,2-Trichloroethane	20.0	18.98		ug/L		95	73 - 123
1,1-Dichloroethane	20.0	19.03		ug/L		95	70 - 127
1,1-Dichloroethene	20.0	18.52		ug/L		93	63 - 132
1,2,3-Trichloropropane	20.0	18.83		ug/L		94	65 - 127
1,2-Dibromo-3-chloropropane	20.0	20.33		ug/L		102	50 - 150
1,2-Dibromoethane (EDB)	20.0	18.11		ug/L		91	75 - 125
1,2-Dichlorobenzene	20.0	19.63		ug/L		98	74 - 120
1,2-Dichloroethane	20.0	19.66		ug/L		98	71 - 125
1,2-Dichloropropane	20.0	17.88		ug/L		89	73 - 124
1,4-Dichlorobenzene	20.0	19.00		ug/L		95	72 - 120
2-Butanone (MEK)	40.0	36.94		ug/L		92	50 - 150
2-Hexanone	40.0	40.34		ug/L		101	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	36.05		ug/L		90	60 - 139
Acetone	40.0	28.79		ug/L		72	50 - 150
Acrylonitrile	200	191.7		ug/L		96	50 - 150
Benzene	20.0	18.85		ug/L		94	72 - 124

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-440950/6**  
**Matrix: Water**  
**Analysis Batch: 440950**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromochloromethane	20.0	18.30		ug/L		92	73 - 130
Bromodichloromethane	20.0	19.05		ug/L		95	74 - 122
Bromoform	20.0	17.92		ug/L		90	61 - 122
Carbon disulfide	20.0	16.68		ug/L		83	59 - 135
Carbon tetrachloride	20.0	19.72		ug/L		99	67 - 132
Chlorobenzene	20.0	19.13		ug/L		96	76 - 120
Chlorodibromomethane	20.0	17.98		ug/L		90	71 - 121
Chloroform	20.0	19.65		ug/L		98	72 - 125
cis-1,2-Dichloroethene	20.0	18.09		ug/L		90	74 - 123
cis-1,3-Dichloropropene	20.0	18.90		ug/L		95	71 - 125
Dibromomethane	20.0	19.41		ug/L		97	74 - 125
Ethylbenzene	20.0	18.41		ug/L		92	74 - 122
Iodomethane	20.0	17.19		ug/L		86	10 - 150
Methylene chloride	20.0	19.02		ug/L		95	50 - 150
Styrene	20.0	18.96		ug/L		95	74 - 121
Tetrachloroethene	20.0	19.18		ug/L		96	71 - 130
Toluene	20.0	19.08		ug/L		95	74 - 123
trans-1,2-Dichloroethene	20.0	17.91		ug/L		90	70 - 126
trans-1,3-Dichloropropene	20.0	20.13		ug/L		101	69 - 123
trans-1,4-Dichloro-2-butene	20.0	19.93		ug/L		100	50 - 150
Trichloroethene	20.0	18.97		ug/L		95	72 - 126
Vinyl acetate	40.0	29.59		ug/L		74	50 - 150
Xylenes, Total	40.0	38.01		ug/L		95	73 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
<i>Dibromofluoromethane (Surr)</i>	100		73 - 130
<i>Toluene-d8 (Surr)</i>	100		80 - 120
<i>4-Bromofluorobenzene (Surr)</i>	101		80 - 120

**Lab Sample ID: LCS 310-440950/7**  
**Matrix: Water**  
**Analysis Batch: 440950**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	15.03		ug/L		75	23 - 150
Chloroethane	20.0	17.39		ug/L		87	54 - 136
Chloromethane	20.0	17.63		ug/L		88	38 - 150
Trichlorofluoromethane	20.0	19.03		ug/L		95	54 - 149
Vinyl chloride	20.0	18.67		ug/L		93	56 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
<i>Dibromofluoromethane (Surr)</i>	105		73 - 130
<i>Toluene-d8 (Surr)</i>	98		80 - 120
<i>4-Bromofluorobenzene (Surr)</i>	102		80 - 120

# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-441013/5**  
**Matrix: Water**  
**Analysis Batch: 441013**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			11/26/24 22:03	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			11/26/24 22:03	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			11/26/24 22:03	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			11/26/24 22:03	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			11/26/24 22:03	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			11/26/24 22:03	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			11/26/24 22:03	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			11/26/24 22:03	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			11/26/24 22:03	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			11/26/24 22:03	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			11/26/24 22:03	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			11/26/24 22:03	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			11/26/24 22:03	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			11/26/24 22:03	1
2-Hexanone	<10.0		10.0	2.00	ug/L			11/26/24 22:03	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			11/26/24 22:03	1
Acetone	<10.0		10.0	3.10	ug/L			11/26/24 22:03	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			11/26/24 22:03	1
Benzene	<0.500		0.500	0.220	ug/L			11/26/24 22:03	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			11/26/24 22:03	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			11/26/24 22:03	1
Bromoform	<5.00		5.00	0.780	ug/L			11/26/24 22:03	1
Bromomethane	<4.00		4.00	1.10	ug/L			11/26/24 22:03	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			11/26/24 22:03	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			11/26/24 22:03	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			11/26/24 22:03	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			11/26/24 22:03	1
Chloroethane	<4.00		4.00	0.790	ug/L			11/26/24 22:03	1
Chloroform	<3.00		3.00	1.30	ug/L			11/26/24 22:03	1
Chloromethane	<3.00		3.00	0.610	ug/L			11/26/24 22:03	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			11/26/24 22:03	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			11/26/24 22:03	1
Dibromomethane	<1.00		1.00	0.330	ug/L			11/26/24 22:03	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			11/26/24 22:03	1
Iodomethane	<10.0		10.0	7.00	ug/L			11/26/24 22:03	1
Methylene chloride	<5.00		5.00	1.70	ug/L			11/26/24 22:03	1
Styrene	<1.00		1.00	0.370	ug/L			11/26/24 22:03	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			11/26/24 22:03	1
Toluene	<1.00		1.00	0.430	ug/L			11/26/24 22:03	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			11/26/24 22:03	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			11/26/24 22:03	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			11/26/24 22:03	1
Trichloroethene	<1.00		1.00	0.430	ug/L			11/26/24 22:03	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			11/26/24 22:03	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			11/26/24 22:03	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			11/26/24 22:03	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			11/26/24 22:03	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: MB 310-441013/5**  
**Matrix: Water**  
**Analysis Batch: 441013**

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

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Dibromofluoromethane (Surr)	102		73 - 130		11/26/24 22:03	1
Toluene-d8 (Surr)	96		80 - 120		11/26/24 22:03	1
4-Bromofluorobenzene (Surr)	99		80 - 120		11/26/24 22:03	1

**Lab Sample ID: LCS 310-441013/6**  
**Matrix: Water**  
**Analysis Batch: 441013**

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

<u>Analyte</u>	<u>Spike Added</u>	<u>LCS Result</u>	<u>LCS Qualifier</u>	<u>Unit</u>	<u>D</u>	<u>%Rec</u>	<u>%Rec Limits</u>
1,1,1,2-Tetrachloroethane	20.0	18.20		ug/L		91	71 - 120
1,1,1-Trichloroethane	20.0	18.83		ug/L		94	73 - 129
1,1,2,2-Tetrachloroethane	20.0	17.86		ug/L		89	68 - 124
1,1,2-Trichloroethane	20.0	17.86		ug/L		89	73 - 123
1,1-Dichloroethane	20.0	19.21		ug/L		96	70 - 127
1,1-Dichloroethene	20.0	19.26		ug/L		96	63 - 132
1,2,3-Trichloropropane	20.0	18.73		ug/L		94	65 - 127
1,2-Dibromo-3-chloropropane	20.0	18.23		ug/L		91	50 - 150
1,2-Dibromoethane (EDB)	20.0	17.42		ug/L		87	75 - 125
1,2-Dichlorobenzene	20.0	19.04		ug/L		95	74 - 120
1,2-Dichloroethane	20.0	18.93		ug/L		95	71 - 125
1,2-Dichloropropane	20.0	17.71		ug/L		89	73 - 124
1,4-Dichlorobenzene	20.0	18.30		ug/L		91	72 - 120
2-Butanone (MEK)	40.0	37.30		ug/L		93	50 - 150
2-Hexanone	40.0	38.63		ug/L		97	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	34.63		ug/L		87	60 - 139
Acetone	40.0	27.11		ug/L		68	50 - 150
Acrylonitrile	200	192.0		ug/L		96	50 - 150
Benzene	20.0	18.42		ug/L		92	72 - 124
Bromochloromethane	20.0	17.82		ug/L		89	73 - 130
Bromodichloromethane	20.0	18.60		ug/L		93	74 - 122
Bromoform	20.0	17.62		ug/L		88	61 - 122
Carbon disulfide	20.0	17.87		ug/L		89	59 - 135
Carbon tetrachloride	20.0	19.88		ug/L		99	67 - 132
Chlorobenzene	20.0	19.03		ug/L		95	76 - 120
Chlorodibromomethane	20.0	17.28		ug/L		86	71 - 121
Chloroform	20.0	19.38		ug/L		97	72 - 125
cis-1,2-Dichloroethene	20.0	17.71		ug/L		89	74 - 123
cis-1,3-Dichloropropene	20.0	17.46		ug/L		87	71 - 125
Dibromomethane	20.0	19.11		ug/L		96	74 - 125
Ethylbenzene	20.0	18.35		ug/L		92	74 - 122
Iodomethane	20.0	16.70		ug/L		84	10 - 150
Methylene chloride	20.0	19.15		ug/L		96	50 - 150
Styrene	20.0	18.46		ug/L		92	74 - 121
Tetrachloroethene	20.0	19.12		ug/L		96	71 - 130
Toluene	20.0	19.21		ug/L		96	74 - 123
trans-1,2-Dichloroethene	20.0	18.00		ug/L		90	70 - 126
trans-1,3-Dichloropropene	20.0	18.43		ug/L		92	69 - 123
trans-1,4-Dichloro-2-butene	20.0	19.61		ug/L		98	50 - 150

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

**Lab Sample ID: LCS 310-441013/6**  
**Matrix: Water**  
**Analysis Batch: 441013**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	20.0	18.90		ug/L		95	72 - 126
Vinyl acetate	40.0	33.20		ug/L		83	50 - 150
Xylenes, Total	40.0	37.55		ug/L		94	73 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	99		73 - 130
Toluene-d8 (Surr)	102		80 - 120
4-Bromofluorobenzene (Surr)	99		80 - 120

**Lab Sample ID: LCS 310-441013/7**  
**Matrix: Water**  
**Analysis Batch: 441013**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	16.41		ug/L		82	23 - 150
Chloroethane	20.0	18.25		ug/L		91	54 - 136
Chloromethane	20.0	18.43		ug/L		92	38 - 150
Trichlorofluoromethane	20.0	19.27		ug/L		96	54 - 149
Vinyl chloride	20.0	18.79		ug/L		94	56 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	101		73 - 130
Toluene-d8 (Surr)	98		80 - 120
4-Bromofluorobenzene (Surr)	104		80 - 120

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-441386/3**  
**Matrix: Water**  
**Analysis Batch: 441386**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.00		1.00	0.420	mg/L			11/27/24 11:43	1

**Lab Sample ID: LCS 310-441386/4**  
**Matrix: Water**  
**Analysis Batch: 441386**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.836		mg/L		98	90 - 110

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

**Lab Sample ID: MB 310-440701/1-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 440701**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 17:08	1

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

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

**Lab Sample ID: MB 310-440701/1-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 440701**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<0.100		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 17:08	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 17:08	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 17:08	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 17:08	1
Barium	<0.00200		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 17:08	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 17:08	1
Nickel	<0.00500		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 17:08	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 17:08	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 17:08	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 17:08	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 17:08	1
Lead	<0.000500		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 17:08	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 17:08	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 17:08	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 17:08	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 17:08	1

**Lab Sample ID: LCS 310-440701/2-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 440701**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.200	0.2102		mg/L		105	80 - 120
Iron	0.200	0.2046		mg/L		102	80 - 120
Cadmium	0.100	0.1021		mg/L		102	80 - 120
Antimony	0.200	0.2091		mg/L		105	80 - 120
Beryllium	0.100	0.1010		mg/L		101	80 - 120
Barium	0.100	0.1064		mg/L		106	80 - 120
Thallium	0.100	0.1045		mg/L		105	80 - 120
Nickel	0.200	0.2074		mg/L		104	80 - 120
Vanadium	0.100	0.1032		mg/L		103	80 - 120
Silver	0.100	0.1160		mg/L		116	80 - 120
Arsenic	0.200	0.2045		mg/L		102	80 - 120
Copper	0.200	0.2027		mg/L		101	80 - 120
Lead	0.200	0.1993		mg/L		100	80 - 120
Zinc	0.200	0.1969		mg/L		98	80 - 120
Selenium	0.400	0.3971		mg/L		99	80 - 120
Chromium	0.100	0.1016		mg/L		102	80 - 120
Cobalt	0.100	0.1024		mg/L		102	80 - 120

**Lab Sample ID: MB 310-440704/1-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.0500		0.0500	0.0210	mg/L		11/25/24 09:30	11/25/24 20:41	1
Iron	<0.100		0.100	0.0360	mg/L		11/25/24 09:30	11/25/24 20:41	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		11/25/24 09:30	11/25/24 20:41	1
Antimony	<0.00200		0.00200	0.00100	mg/L		11/25/24 09:30	11/25/24 20:41	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

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

**Lab Sample ID: MB 310-440704/1-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.00100		0.00100	0.000330	mg/L		11/25/24 09:30	11/25/24 20:41	1
Barium	<0.00200		0.00200	0.000660	mg/L		11/25/24 09:30	11/25/24 20:41	1
Thallium	<0.00100		0.00100	0.000570	mg/L		11/25/24 09:30	11/25/24 20:41	1
Nickel	<0.00500		0.00500	0.00210	mg/L		11/25/24 09:30	11/25/24 20:41	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		11/25/24 09:30	11/25/24 20:41	1
Silver	<0.00100		0.00100	0.000500	mg/L		11/25/24 09:30	11/25/24 20:41	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		11/25/24 09:30	11/25/24 20:41	1
Copper	<0.00500		0.00500	0.00180	mg/L		11/25/24 09:30	11/25/24 20:41	1
Lead	<0.000500		0.000500	0.000260	mg/L		11/25/24 09:30	11/25/24 20:41	1
Zinc	<0.0200		0.0200	0.00970	mg/L		11/25/24 09:30	11/25/24 20:41	1
Selenium	<0.00500		0.00500	0.00140	mg/L		11/25/24 09:30	11/25/24 20:41	1
Chromium	<0.00500		0.00500	0.00120	mg/L		11/25/24 09:30	11/25/24 20:41	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		11/25/24 09:30	11/25/24 20:41	1

**Lab Sample ID: LCS 310-440704/2-A**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.200	0.2103		mg/L		105	80 - 120
Iron	0.200	0.2006		mg/L		100	80 - 120
Cadmium	0.100	0.1031		mg/L		103	80 - 120
Antimony	0.200	0.2125		mg/L		106	80 - 120
Beryllium	0.100	0.09362		mg/L		94	80 - 120
Barium	0.100	0.1098		mg/L		110	80 - 120
Thallium	0.100	0.1082		mg/L		108	80 - 120
Nickel	0.200	0.2061		mg/L		103	80 - 120
Vanadium	0.100	0.1016		mg/L		102	80 - 120
Silver	0.100	0.1188		mg/L		119	80 - 120
Arsenic	0.200	0.1982		mg/L		99	80 - 120
Copper	0.200	0.1987		mg/L		99	80 - 120
Lead	0.200	0.1958		mg/L		98	80 - 120
Zinc	0.200	0.1914		mg/L		96	80 - 120
Selenium	0.400	0.3812		mg/L		95	80 - 120
Chromium	0.100	0.09863		mg/L		99	80 - 120
Cobalt	0.100	0.1008		mg/L		101	80 - 120

**Lab Sample ID: 310-295795-5 MS**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: DW-19**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.176	F1 F2	0.200	0.6584	F1	mg/L		241	75 - 125
Iron	0.205	F1 F2	0.200	0.7553	F1	mg/L		275	75 - 125
Cadmium	0.000176	J	0.100	0.1061		mg/L		106	75 - 125
Antimony	<0.00200		0.200	0.2232		mg/L		112	75 - 125
Beryllium	<0.00100		0.100	0.09356		mg/L		94	75 - 125
Barium	0.0255		0.100	0.1426		mg/L		117	75 - 125
Thallium	<0.00100		0.100	0.1167		mg/L		117	75 - 125

Eurofins Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

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

**Lab Sample ID: 310-295795-5 MS**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: DW-19**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nickel	<0.00500		0.200	0.1977		mg/L		99	75 - 125
Vanadium	<0.00500		0.100	0.1032		mg/L		103	75 - 125
Silver	<0.00100		0.100	0.1179		mg/L		118	75 - 125
Arsenic	<0.00200		0.200	0.2129		mg/L		106	75 - 125
Copper	<0.00500		0.200	0.1966		mg/L		98	75 - 125
Lead	0.000261	J	0.200	0.2133		mg/L		107	75 - 125
Zinc	<0.0200		0.200	0.1979		mg/L		99	75 - 125
Selenium	<0.00500		0.400	0.3951		mg/L		99	75 - 125
Chromium	<0.00500		0.100	0.1029		mg/L		103	75 - 125
Cobalt	0.000304	J	0.100	0.1016		mg/L		101	75 - 125

**Lab Sample ID: 310-295795-5 MSD**  
**Matrix: Water**  
**Analysis Batch: 440930**

**Client Sample ID: DW-19**  
**Prep Type: Total/NA**  
**Prep Batch: 440704**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aluminum	0.176	F1 F2	0.200	0.4486	F1 F2	mg/L		136	75 - 125	38	20
Iron	0.205	F1 F2	0.200	0.4783	F1 F2	mg/L		137	75 - 125	45	20
Cadmium	0.000176	J	0.100	0.1074		mg/L		107	75 - 125	1	20
Antimony	<0.00200		0.200	0.2286		mg/L		114	75 - 125	2	20
Beryllium	<0.00100		0.100	0.09535		mg/L		95	75 - 125	2	20
Barium	0.0255		0.100	0.1431		mg/L		118	75 - 125	0	20
Thallium	<0.00100		0.100	0.1177		mg/L		118	75 - 125	1	20
Nickel	<0.00500		0.200	0.1987		mg/L		99	75 - 125	1	20
Vanadium	<0.00500		0.100	0.1049		mg/L		105	75 - 125	2	20
Silver	<0.00100		0.100	0.1192		mg/L		119	75 - 125	1	20
Arsenic	<0.00200		0.200	0.2160		mg/L		108	75 - 125	1	20
Copper	<0.00500		0.200	0.1992		mg/L		100	75 - 125	1	20
Lead	0.000261	J	0.200	0.2158		mg/L		108	75 - 125	1	20
Zinc	<0.0200		0.200	0.1978		mg/L		99	75 - 125	0	20
Selenium	<0.00500		0.400	0.4048		mg/L		101	75 - 125	2	20
Chromium	<0.00500		0.100	0.1038		mg/L		104	75 - 125	1	20
Cobalt	0.000304	J	0.100	0.1021		mg/L		102	75 - 125	1	20

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

**Lab Sample ID: MB 310-440692/1**  
**Matrix: Water**  
**Analysis Batch: 440692**

**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			11/22/24 13:06	1

**Lab Sample ID: LCS 310-440692/2**  
**Matrix: Water**  
**Analysis Batch: 440692**

**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	105.0		mg/L		105	81 - 116

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

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

Lab Sample ID: MB 310-440697/1  
 Matrix: Water  
 Analysis Batch: 440697

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			11/22/24 13:37	1

Lab Sample ID: LCS 310-440697/2  
 Matrix: Water  
 Analysis Batch: 440697

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	1000	1020		mg/L		102	81 - 116

## Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-440741/25  
 Matrix: Water  
 Analysis Batch: 440741

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3 to pH 4.5	1000	939.8		mg/L		94	86 - 111

# QC Association Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## GC/MS VOA

### Analysis Batch: 440638

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-11	Trip Blank 3	Total/NA	Water	8260D	
MB 310-440638/5	Method Blank	Total/NA	Water	8260D	
LCS 310-440638/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-440638/7	Lab Control Sample	Total/NA	Water	8260D	

### Analysis Batch: 440646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	8260D	
310-295795-2	UW-10	Total/NA	Water	8260D	
310-295795-3	UW-11	Total/NA	Water	8260D	
310-295795-4	PZ-14	Total/NA	Water	8260D	
310-295795-5	DW-19	Total/NA	Water	8260D	
310-295795-6	DW-23	Total/NA	Water	8260D	
310-295795-7	DW-24	Total/NA	Water	8260D	
310-295795-8	MW-D	Total/NA	Water	8260D	
310-295795-9	Trip Blank 1	Total/NA	Water	8260D	
310-295795-10	Trip Blank 2	Total/NA	Water	8260D	
MB 310-440646/5	Method Blank	Total/NA	Water	8260D	
LCS 310-440646/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-440646/7	Lab Control Sample	Total/NA	Water	8260D	
310-295795-2 MS	UW-10	Total/NA	Water	8260D	
310-295795-2 MSD	UW-10	Total/NA	Water	8260D	

### Analysis Batch: 440950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	8260D	
310-295795-2	UW-10	Total/NA	Water	8260D	
310-295795-3	UW-11	Total/NA	Water	8260D	
310-295795-4	PZ-14	Total/NA	Water	8260D	
310-295795-5	DW-19	Total/NA	Water	8260D	
310-295795-7	DW-24	Total/NA	Water	8260D	
310-295795-8	MW-D	Total/NA	Water	8260D	
310-295795-9	Trip Blank 1	Total/NA	Water	8260D	
310-295795-10	Trip Blank 2	Total/NA	Water	8260D	
310-295795-11	Trip Blank 3	Total/NA	Water	8260D	
MB 310-440950/5	Method Blank	Total/NA	Water	8260D	
LCS 310-440950/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-440950/7	Lab Control Sample	Total/NA	Water	8260D	

### Analysis Batch: 441013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-6	DW-23	Total/NA	Water	8260D	
MB 310-441013/5	Method Blank	Total/NA	Water	8260D	
LCS 310-441013/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-441013/7	Lab Control Sample	Total/NA	Water	8260D	

## HPLC/IC

### Analysis Batch: 441386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	9056A	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## HPLC/IC (Continued)

### Analysis Batch: 441386 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-2	UW-10	Total/NA	Water	9056A	
310-295795-3	UW-11	Total/NA	Water	9056A	
310-295795-4	PZ-14	Total/NA	Water	9056A	
310-295795-5	DW-19	Total/NA	Water	9056A	
310-295795-6	DW-23	Total/NA	Water	9056A	
310-295795-7	DW-24	Total/NA	Water	9056A	
310-295795-8	MW-D	Total/NA	Water	9056A	
MB 310-441386/3	Method Blank	Total/NA	Water	9056A	
LCS 310-441386/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 440701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	3005A	
310-295795-2	UW-10	Total/NA	Water	3005A	
310-295795-3	UW-11	Total/NA	Water	3005A	
310-295795-4	PZ-14	Total/NA	Water	3005A	
MB 310-440701/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-440701/2-A	Lab Control Sample	Total/NA	Water	3005A	

### Prep Batch: 440704

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-5	DW-19	Total/NA	Water	3005A	
310-295795-6	DW-23	Total/NA	Water	3005A	
310-295795-7	DW-24	Total/NA	Water	3005A	
310-295795-8	MW-D	Total/NA	Water	3005A	
MB 310-440704/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-440704/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-295795-5 MS	DW-19	Total/NA	Water	3005A	
310-295795-5 MSD	DW-19	Total/NA	Water	3005A	

### Analysis Batch: 440930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	6020B	440701
310-295795-2	UW-10	Total/NA	Water	6020B	440701
310-295795-3	UW-11	Total/NA	Water	6020B	440701
310-295795-4	PZ-14	Total/NA	Water	6020B	440701
310-295795-5	DW-19	Total/NA	Water	6020B	440704
310-295795-6	DW-23	Total/NA	Water	6020B	440704
310-295795-7	DW-24	Total/NA	Water	6020B	440704
310-295795-8	MW-D	Total/NA	Water	6020B	440704
MB 310-440701/1-A	Method Blank	Total/NA	Water	6020B	440701
MB 310-440704/1-A	Method Blank	Total/NA	Water	6020B	440704
LCS 310-440701/2-A	Lab Control Sample	Total/NA	Water	6020B	440701
LCS 310-440704/2-A	Lab Control Sample	Total/NA	Water	6020B	440704
310-295795-5 MS	DW-19	Total/NA	Water	6020B	440704
310-295795-5 MSD	DW-19	Total/NA	Water	6020B	440704

# QC Association Summary

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Metals

### Analysis Batch: 441029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-4	PZ-14	Total/NA	Water	6020B	440701

### Analysis Batch: 441078

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-6	DW-23	Total/NA	Water	6020B	440704

### Analysis Batch: 445109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-6	DW-23	Total/NA	Water	6020B	440704

## General Chemistry

### Analysis Batch: 440692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	I-3765-85	
310-295795-2	UW-10	Total/NA	Water	I-3765-85	
310-295795-4	PZ-14	Total/NA	Water	I-3765-85	
310-295795-5	DW-19	Total/NA	Water	I-3765-85	
310-295795-6	DW-23	Total/NA	Water	I-3765-85	
310-295795-7	DW-24	Total/NA	Water	I-3765-85	
310-295795-8	MW-D	Total/NA	Water	I-3765-85	
MB 310-440692/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-440692/2	Lab Control Sample	Total/NA	Water	I-3765-85	

### Analysis Batch: 440697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-3	UW-11	Total/NA	Water	I-3765-85	
MB 310-440697/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-440697/2	Lab Control Sample	Total/NA	Water	I-3765-85	

### Analysis Batch: 440741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-295795-1	DW-8	Total/NA	Water	SM 2320B	
310-295795-2	UW-10	Total/NA	Water	SM 2320B	
310-295795-3	UW-11	Total/NA	Water	SM 2320B	
310-295795-4	PZ-14	Total/NA	Water	SM 2320B	
310-295795-5	DW-19	Total/NA	Water	SM 2320B	
310-295795-6	DW-23	Total/NA	Water	SM 2320B	
310-295795-7	DW-24	Total/NA	Water	SM 2320B	
310-295795-8	MW-D	Total/NA	Water	SM 2320B	
LCS 310-440741/25	Lab Control Sample	Total/NA	Water	SM 2320B	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## Client Sample ID: DW-8

## Lab Sample ID: 310-295795-1

Date Collected: 11/18/24 10:30

Matrix: Water

Date Received: 11/21/24 16:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 12:33
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 17:10
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 14:19
Total/NA	Prep	3005A			440701	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 18:36
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 19:06

## Client Sample ID: UW-10

## Lab Sample ID: 310-295795-2

Date Collected: 11/20/24 11:02

Matrix: Water

Date Received: 11/21/24 16:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 09:54
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 17:33
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 14:34
Total/NA	Prep	3005A			440701	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 18:38
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 19:16

## Client Sample ID: UW-11

## Lab Sample ID: 310-295795-3

Date Collected: 11/20/24 12:23

Matrix: Water

Date Received: 11/21/24 16:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 12:56
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 19:03
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 14:50
Total/NA	Prep	3005A			440701	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 18:41
Total/NA	Analysis	I-3765-85		1	440697	HE7K	EET CF	11/22/24 13:37
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 19:35

## Client Sample ID: PZ-14

## Lab Sample ID: 310-295795-4

Date Collected: 11/20/24 11:48

Matrix: Water

Date Received: 11/21/24 16:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 13:19
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 19:26
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 15:05

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: PZ-14**  
**Date Collected: 11/20/24 11:48**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-4**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			440701	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 18:44
Total/NA	Prep	3005A			440701	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		4	441029	A6US	EET CF	11/26/24 12:29
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 19:47

**Client Sample ID: DW-19**  
**Date Collected: 11/18/24 14:57**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 13:41
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 17:55
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 15:52
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 20:47
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 19:54

**Client Sample ID: DW-23**  
**Date Collected: 11/20/24 13:01**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-6**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 14:04
Total/NA	Analysis	8260D		1	441013	MZR8	EET CF	11/27/24 05:58
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 16:08
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		4	441078	NFT2	EET CF	11/26/24 13:41
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 21:01
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		4	445109	NFT2	EET CF	01/20/25 11:21
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 20:17

**Client Sample ID: DW-24**  
**Date Collected: 11/18/24 13:39**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-7**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 14:27
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 18:18

Eurofins Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
 SDG: Mahaska County Sanitary Landfill, Binns & Stevens

**Client Sample ID: DW-24**  
**Date Collected: 11/18/24 13:39**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-7**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 16:23
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 21:04
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 20:13

**Client Sample ID: MW-D**  
**Date Collected: 11/18/24 14:57**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-8**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 14:50
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 18:41
Total/NA	Analysis	9056A		100	441386	WZC8	EET CF	11/27/24 16:39
Total/NA	Prep	3005A			440704	F5MW	EET CF	11/25/24 09:30
Total/NA	Analysis	6020B		1	440930	A6US	EET CF	11/25/24 21:18
Total/NA	Analysis	I-3765-85		1	440692	HE7K	EET CF	11/22/24 13:06
Total/NA	Analysis	SM 2320B		1	440741	MDU9	EET CF	11/22/24 20:04

**Client Sample ID: Trip Blank 1**  
**Date Collected: 11/18/24 00:00**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-9**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 08:46
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 12:39

**Client Sample ID: Trip Blank 2**  
**Date Collected: 11/18/24 00:00**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-10**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440646	D2YP	EET CF	11/23/24 09:09
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 13:02

**Client Sample ID: Trip Blank 3**  
**Date Collected: 11/18/24 00:00**  
**Date Received: 11/21/24 16:25**

**Lab Sample ID: 310-295795-11**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	440638	MZR8	EET CF	11/22/24 21:52
Total/NA	Analysis	8260D		1	440950	D2YP	EET CF	11/26/24 13:24

**Laboratory References:**

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

Eurofins Cedar Falls

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

## 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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15



# Method Summary

Client: SCS Engineers  
Project/Site: 2nd 2024 HMSP Sampling Event

Job ID: 310-295795-1  
SDG: Mahaska County Sanitary Landfill, Binns & Stevens

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2320B	Alkalinity	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

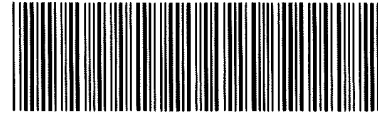
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

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





Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>11/21/24</u>	TIME <u>1625</u>	Received By: <u>XB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<u>DW-24</u>		<u>TB 1</u>	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>2</u>		Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>2.7</u>		Corrected Temp (°C): <u>2.7</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SS</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>1/21/24</u>	TIME <u>1625</u>	Received By: <u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Cooler ID:</i>			
Multiple Coolers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Cooler # <u>2</u> of <u>3</u></i>			
Cooler Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No</i>			
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No</i>			
Trip Blank Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Which VOA samples are in cooler? ↓</i>			
<u>all the rest of the vials TBZ</u>			
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>2</u>		Correction Factor (°C): <u>0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>2.1</u>		Corrected Temp (°C): <u>2.1</u>	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1		CONTAINER 2
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) <i>If yes: Is there evidence that the chilling process began?</i> <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>1/21/24</u>	TIME <u>10:25</u>	Received By: <u>JB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler ID: _____			
Multiple Coolers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler # <u>3</u> of <u>3</u>			
Cooler Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Trip Blank Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Which VOA samples are in cooler? ↓ <u>Just trip Blanks, TB3</u>			
<b>Temperature Record</b>			
Coolant: <input type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input checked="" type="checkbox"/> NONE			
Thermometer ID: <u>Z</u>		Correction Factor (°C): <u>0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): _____		Corrected Temp (°C): _____	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1 <u>VOA Vial</u>	CONTAINER 2 <u>→</u>	
Uncorrected Temp (°C):	<u>18.6</u>	<u>17.4</u>	
Corrected Temp (°C):	<u>18.6</u>	<u>17.4</u>	
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b> <u>No ice</u>			



Cedar Falls, IA 50613-6907  
phone 319 277 2401 fax 319 277 2425

TestAmerica Des Moines SC  
214

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Regulatory Program:  DW  NPDES  RCRA  Other

Project Manager: Benjamin Madson  
Email bmadson@sceengineers.com  
Cell (515) 776-9255

Client Contact  
Benjamin Madson  
SCS Engineers  
1690 All-State Court, Suite 100  
West Des Moines, IA 50265  
515-631-6160  
Project Name: 2nd 2024 HMSP Sampling Event  
Site: Mahaska County Sanitary Landfill, Binns & Stevens  
P O # 27224360 25

Site Contact: Joe Farris  
Lab Contact:  
Date: \_\_\_\_\_  
Carrier: \_\_\_\_\_  
COC No 1 \_\_\_\_\_ of 1 COCs

Analysis Turnaround Time  
 CALENDAR DAYS  WORKING DAYS  
Other:  
 2 weeks  
 1 week  
 2 days  
 1 day

Sample Identification	Sample Date	Sample Time	Type (C=Comp)	Matrix	# of Cont.	Filtered Sample (Y/N)	Performs MS/MSD (Y/N)	Appendix	Total Suspended Solids	Alkalinity	Iron	Sulfate	Trip Blank	Sample Specific Notes
DW-8	11/18/24	6:50	G	W		Y	X	X	X	X	X	X		
UW-9R			G	W		Y	X	X	X	X	X	X		
US-9RA			G	W		Y	X	X	X	X	X	X		
UW-10	11/20/24	11:20	G	W		Y	X	X	X	X	X	X		
UW-11	11/20/24	12:23	G	W		Y	X	X	X	X	X	X		
PZ-14	11/20/24	11:48	G	W		Y	X	X	X	X	X	X		
DW-15			G	W		Y	X	X	X	X	X	X		
DW-19	11/18/24	14:57	G	W		Y	X	X	X	X	X	X		
UW-21			G	W		Y	X	X	X	X	X	X		
DW-23	11/20/24	13:01	G	W		Y	X	X	X	X	X	X		
DW-24	11/18/24	13:39	G	W		Y	X	X	X	X	X	X		
MW-D	11/18/24	14:57	G	W		Y	X	X	X	X	X	X		
GU-1			G	W		Y	X	X	X	X	X	X		
Trip Blank													X	Please include trip blanks in coolers containing VOC sample containers.

Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:  
 Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.	Cooler Temp (°C)	Obs'd	Corr'd	Therm ID No.
Relinquished by: <i>Collettar</i>	Company: <i>SCS</i>	Received by:	Company:	Received by:	Date/Time: 11/20/24 14:00
Relinquished by:	Company:	Received by:	Company:	Received by:	Date/Time:
Relinquished by:	Company:	Received in Laboratory by: <i>BS</i>	Company: <i>SCS</i>	Received in Laboratory by:	Date/Time: 11/21/24 16:25



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-295795-1

SDG Number: Mahaska County Sanitary Landfill, Binns & Stevens

**Login Number: 295795**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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 <math><6\text{mm}</math> (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 Documentation**

Completed by: Sean Marczewski  
 Date of Sampling: 5/14/2024  
 Lab Report Date: 5/28/2024  
 Site Name: Mahaska County Sanitary Landfill - Binns & Stevens  
 Project Type: HMSP - 1<sup>st</sup> 2024 Semi-Annual Sampling Event  
 Lab Report Number: 310-281485-1

OK NO N/A NOTES

**Sample Collection and Sample Handling**

Chain of Custody	X		
Temperature	X		
Preservation	X		
Condition	X		
Case Narrative	X		
Holding Times	X		

**Analytical Sensitivity and Blanks**

Method Blank Detections	X		No detections.
Trip Blank Detections	X		No detections.

**Accuracy**

ICV/CCV		X	Method 8260D: The continuing calibration verification (CCV) associated with batch 310-422323 recovered above the upper control limit for cis-1,3 Dichloropropene (22.5%D) and 4-Methyl-2-pentanone (MIBK) (22.7%D). The LCS associated with this CCV passes CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-422323/3).
LCS/LCSD	X		
MS/MSD	X		
Surrogates (organics only)	X		

**Precision**

QA/QC Sample RPDs	X		
Field Duplicates	X		The measured concentrations for sample DW-19 and duplicate sample MW-D had <50% RPD for analyzed parameters.



Completed by: Sean Marczewski  
 Date of Sampling: 11/18/2024  
 Lab Report Date: 1/21/2025  
 Site Name: Mahaska County Sanitary Landfill - Binns & Stevens  
 Project Type: HMSP - 2<sup>nd</sup> 2024 Semi-Annual Sampling Event  
 Lab Report Number: 310-295795-1

OK NO N/A NOTES

**Sample Collection and Sample Handling**

Chain of Custody	X		
Temperature	X		
Preservation		X	Method 8260D: The preservative used in the sample containers provided is not compatible with one of the Method 8260 analytes requested. The following sample was received preserved with hydrochloric acid: Trip Blank 3 (310-295795-11). The requested target analyte list includes acrylonitrile, acid-labile compounds that degrades in an acidic medium.  Method 8260D: The preservative used in the sample containers provided is not compatible with one of the Method 8260 analytes requested. The following samples were received preserved with hydrochloric acid: DW-8 (310-295795-1), UW-10 (310-295795-2), UW-11 (310-295795-3), PZ-14 (310-295795-4), DW-19 (310-295795-5), DW-23 (310-295795-6), DW-24 (310-295795-7), MW-D (310-295795-8), Trip Blank 1 (310-295795-9) and Trip Blank 2 (310-295795-10). The requested target analyte list includes acrylonitrile, acid-labile compounds that degrades in an acidic medium.
Condition	X		
Case Narrative		X	Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): Trip Blank 3 (310-295795-11).  Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container(s): Trip Blank 3 (310-295795-11).
Holding Times		X	Method 8260D: The following sample was analyzed outside of analytical holding time: Acrylonitrile: DW-19 (310-295795-5).

**Analytical Sensitivity and Blanks**

Method Blank Detections	X		No detections.
Trip Blank Detections	X		No detections.

**Accuracy**

ICV/CCV		X	Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440646 recovered below the lower control limit for Trichlorofluoromethane (-29.2 %D). The laboratory control sample associated with this CCV was within CCV control criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440646/4).  Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440638 recovered above the upper control limit for Trichloroethene (26.0D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440638/3).  Method 8260D: The continuing calibration verification (CCV) associated with batch 310-440950 recovered outside the control limit for Chloroethane (-23.7%D). The LCS associated with this CCV passes CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-440950/4).
LCS/LCSD	X		
MS/MSD	X		
Surrogates (organics only)	X		

**Precision**

QA/QC Sample RPDs	X		
Field Duplicates	X		The measured concentrations for sample DW-24 and duplicate sample MW-D had <50% RPD for analyzed parameters.

**Appendix C**  
**Summary of Groundwater Chemistry**

# SCS ENGINEERS

## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Antimony, mg/L (CAS NO - 7440-36-0)	4/8/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	< 0.01	0.0102
	6/24/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	9/17/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	12/11/2008	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A	N/A	< 0.01	N/A	< 0.01
	5/7/2009	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01
	10/23/2009	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01
	4/22/2010	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A	N/A	< 0.01	< 0.01	< 0.01
	8/30/2010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	N/A	< 0.01	< 0.01
	10/26/2010	< 0.01	< 0.01	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A
	1/12/2011	N/A	N/A	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	< 0.01
	3/28/2011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	< 0.01	< 0.01
	7/19/2011	< 0.01	< 0.01	< 0.01	0.0117	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A
	10/25/2011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A
	12/15/2011	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	N/A	< 0.01
	4/16/2012	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	7/6/2012	N/A	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	N/A	< 0.002
	9/26/2012	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	N/A	< 0.0005	N/A
	12/12/2012	< 0.002	N/A	< 0.002	< 0.002	< 0.002	N/A	N/A	< 0.002	N/A	N/A
	4/24/2013	< 0.002	< 0.0005	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	10/28/2013	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A	< 0.002	N/A
	4/25/2014	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	10/20/2014	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	4/17/2015	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	10/12/2015	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	4/18/2016	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A	< 0.002	N/A
	10/25/2016	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	4/26/2017	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	10/24/2017	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	4/18/2018	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A
	10/24/2018	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A
	4/17/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A
	10/23/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	4/29/2020	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	10/19/2020	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	4/14/2021	0.00155*	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	4/14/2021	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A
	9/8/2021	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	9/8/2021	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.002	< 0.002	N/A	< 0.002	< 0.008	< 0.002	< 0.008	N/A	< 0.002
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.008	N/A	N/A
	6/24/2022	< 0.002	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	9/20/2022	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	2/8/2023	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8/23/2023	N/A	< 0.002	< 0.002	N/A	< 0.002	N/A	< 0.002	< 0.002	< 0.002	N/A	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	
5/14/2024	< 0.002	< 0.002	< 0.002	N/A	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	
11/18/2024	N/A	< 0.002	< 0.002	N/A	< 0.002	< 0.008	< 0.002	< 0.002	< 0.002	N/A	
11/18/2024	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Arsenic, mg/L (CAS NO - 7440-38-2)	4/8/2008	0.0151	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	0.0225	0.01
	6/24/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	9/17/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	10/27/2008	< 0.01	N/A	0.06	N/A	< 0.01	N/A	N/A	N/A	N/A	< 0.01
	12/11/2008	0.012	0.0382	0.0283	N/A	< 0.01	N/A	N/A	0.0247	N/A	< 0.01
	5/7/2009	0.0155	0.0792	0.0175	N/A	< 0.01	N/A	N/A	0.0146	0.0108	< 0.01
	10/23/2009	0.0131	0.0295	0.0329	N/A	< 0.01	N/A	N/A	< 0.01	0.0227	0.0141
	4/22/2010	< 0.01	0.0158	0.0133	N/A	< 0.01	N/A	N/A	0.012	0.0104	0.0306
	8/30/2010	0.0207	0.077	0.0239	0.027	0.0059	N/A	N/A	0.0129	< 0.01	0.0065
	10/26/2010	0.0106	0.0142	< 0.01	< 0.0231	< 0.01	N/A	N/A	< 0.01	0.0101	< 0.01
	1/12/2011	N/A	N/A	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	< 0.01
	3/28/2011	< 0.01	< 0.01	< 0.01	0.013	< 0.01	< 0.01	N/A	< 0.01	< 0.01	< 0.01
	7/19/2011	0.0213	0.106	< 0.01	0.0154	< 0.01	0.0198	N/A	0.0224	N/A	< 0.01
	10/25/2011	< 0.01	< 0.01	< 0.01	0.0126	< 0.01	0.0122	N/A	0.0185	N/A	< 0.01
	12/15/2011	N/A	< 0.01	< 0.01	0.012	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01
	4/16/2012	< 0.004	< 0.004	< 0.004	0.0075	< 0.004	< 0.004	N/A	0.0109	N/A	< 0.004
	7/6/2012	N/A	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004
	9/26/2012	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0133	N/A	< 0.004
	12/12/2012	< 0.004	N/A	< 0.004	< 0.004	N/A	N/A	N/A	0.0067	N/A	N/A
	4/24/2013	< 0.004	0.11	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/28/2013	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0089	N/A	< 0.004
	4/25/2014	0.0698	0.0965	0.0174	0.0079	0.0085	< 0.004	N/A	0.0164	N/A	0.008
	10/20/2014	0.0059	0.0163	0.0048	0.0077	0.0056	< 0.004	N/A	0.0151	N/A	0.0119
	4/17/2015	< 0.004	< 0.004	0.0049	< 0.004	0.0057	< 0.004	N/A	0.0046	N/A	< 0.004
	10/12/2015	< 0.004	< 0.004	< 0.004	0.0059	< 0.004	< 0.004	N/A	0.005	N/A	< 0.004
	4/18/2016	< 0.004	< 0.004	< 0.004	0.0052	N/A	< 0.004	N/A	0.0066	N/A	< 0.004
	10/25/2016	< 0.004	< 0.004	< 0.004	0.0048	< 0.004	< 0.004	N/A	0.006	N/A	< 0.004
	4/26/2017	< 0.004	< 0.004	< 0.004	0.0043	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Arsenic, mg/L (CAS NO - 7440-38-2)	10/24/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0048	N/A	0.005	
	4/18/2018	< 0.004	< 0.004	< 0.004	0.0045	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
	10/24/2018	< 0.004	< 0.004	< 0.004	0.0059	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A	
	4/17/2019	< 0.004	< 0.004	< 0.004	0.0098	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0055	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A	
	10/23/2019	< 0.004	< 0.004	0.0052	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0082	
	4/29/2020	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
	10/19/2020	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0064	
	4/14/2021	0.00205	< 0.002	< 0.008	< 0.008	0.00134*	< 0.008	< 0.002	< 0.008	N/A	0.00525	
	4/14/2021	N/A	N/A	N/A	N/A	0.00152*	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	< 0.002	< 0.002	0.00144*	0.0022	< 0.002	0.0016*	< 0.002	< 0.002	N/A	0.00712	
	9/8/2021	N/A	N/A	0.00172*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	< 0.002	0.00259	N/A	< 0.002	0.00126*	< 0.002	0.000991*	N/A	0.00301	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	
	6/24/2022	< 0.002	N/A	N/A	0.00166*	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	0.0011*	< 0.002	0.00245	0.00199*	< 0.002	0.00126*	0.00118*	0.000769*	N/A	0.00628	
	9/20/2022	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	< 0.002	< 0.002	0.00371	0.0028	0.000917*	0.000943*	0.000795*	< 0.002	N/A	0.00293	
	2/8/2023	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	< 0.002	0.00202	N/A	0.000902*	N/A	0.000813*	0.000803*	N/A	0.00274	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.000865*	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	
	5/14/2024	0.005	< 0.002	0.000724*	N/A	0.000941*	0.00139*	0.00138*	0.000586*	N/A	0.00425	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00113*	N/A	N/A	N/A	
	11/18/2024	N/A	< 0.002	0.00177*	N/A	0.00192*	< 0.008	0.00131*	0.00106*	N/A	0.00155*	
	11/18/2024	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Barium, mg/L (CAS NO - 7440-39-3)	4/8/2008	0.458	N/A	0.885	N/A	N/A	N/A	N/A	N/A	0.846	0.0826
		6/24/2008	0.0365	N/A	0.2023	N/A	N/A	N/A	N/A	N/A	N/A	0.0235
		9/17/2008	0.0601	N/A	0.806	N/A	N/A	N/A	N/A	N/A	N/A	0.0474
		10/27/2008	0.717	N/A	0.931	N/A	0.104	N/A	N/A	N/A	N/A	0.149
		12/11/2008	0.663	1.34	1.98	N/A	0.0645	N/A	N/A	1.19	N/A	0.0882
		5/7/2009	0.846	1.14	1.12	N/A	0.126	N/A	N/A	0.336	0.88	0.0364
		10/23/2009	0.319	0.289	1.31	N/A	0.0881	N/A	N/A	0.0353	0.753	0.524
		4/22/2010	0.232	0.12	0.49	N/A	0.0742	N/A	N/A	0.178	0.629	1.18
8/30/2010		0.678	1.13	0.557	0.372	0.0972	N/A	N/A	0.325	0.187	0.161	
10/26/2010		0.0644	0.073	0.0314	0.0556	0.0722	N/A	N/A	0.0806	0.243	0.0296	
1/12/2011		N/A	N/A	0.141	N/A	0.0802	N/A	N/A	N/A	N/A	0.0784	
3/28/2011		0.0559	0.0197	0.0164	0.0558	0.0548	0.0171	N/A	0.0559	0.348	0.0222	
7/19/2011		0.688	1.16	0.0419	0.0452	0.0441	0.0232	N/A	0.25	N/A	0.0419	
10/25/2011		0.103	0.0217	0.0287	0.0245	0.0444	0.0154	N/A	0.0385	N/A	0.0287	
12/15/2011		N/A	0.0143	0.0154	0.0131	0.0455	0.0162	N/A	N/A	N/A	0.0258	
4/16/2012		0.122	0.0354	0.0197	0.0188	0.0537	0.0108	N/A	0.0262	N/A	0.0222	
7/6/2012		N/A	0.0273	0.0178	0.0141	0.0457	0.0125	N/A	N/A	N/A	0.0183	
9/26/2012		0.0454	0.0424	0.0185	0.0119	0.0412	0.0143	N/A	0.0245	N/A	0.0195	
12/12/2012		0.0453	N/A	0.0166	0.0122	N/A	N/A	N/A	0.0181	N/A	N/A	
4/24/2013		0.0614	1.42	0.0311	0.0705	0.1	0.0297	N/A	0.142	N/A	0.0808	
10/28/2013		0.0724	0.0263	0.0298	0.0235	N/A	0.024	N/A	0.269	N/A	0.0291	
4/25/2014		1.82	1.33	0.121	0.0426	0.182	0.0178	N/A	0.223	N/A	0.181	
10/20/2014		0.326	0.255	0.199	0.038	0.118	0.023	N/A	0.179	N/A	0.0388	
4/17/2015		0.155	0.0251	0.0158	0.0137	0.126	0.0177	N/A	0.0157	N/A	0.0194	
10/12/2015		0.173	0.0448	0.0127	0.011	0.067	0.0126	N/A	0.0248	N/A	0.0205	
4/18/2016		0.137	0.0354	0.0172	0.0131	N/A	0.0162	N/A	0.0202	N/A	0.0231	
10/25/2016		0.165	0.0201	0.0142	0.0133	0.0434	0.0144	N/A	0.0129	N/A	0.0669	
4/26/2017		0.157	0.029	0.0148	0.0146	0.0609	0.0118	N/A	0.0125	N/A	0.0136	
10/24/2017		0.157	0.0235	0.0151	0.0141	0.0475	0.0122	N/A	0.0149	N/A	0.0281	
4/18/2018		0.0873	0.0223	0.0158	0.0126	0.0548	0.0121	N/A	0.0141	N/A	0.0179	
10/24/2018		0.259	0.0245	0.0165	0.0227	0.0487	0.0132	0.0154	0.0201	N/A	0.0315	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	0.0122	N/A	N/A	N/A	
4/17/2019		0.167	0.0332	0.031	0.0152	0.0366	0.0157	0.0084	0.091	N/A	0.0279	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	0.0106	N/A	N/A	N/A	
10/23/2019		0.17	0.0311	0.0401	0.0129	0.035	0.0135	0.0119	0.0421	N/A	0.0346	
4/29/2020		0.163	0.0216	0.0176	0.011	0.037	0.011	0.0052	0.0291	N/A	0.0168	
10/19/2020		0.172	0.0302	0.0169	0.0112	0.0382	0.0215	0.0091	0.026	N/A	0.0307	
4/14/2021		0.351	0.0216	0.021	0.0114	0.0487	0.0111	0.00833	0.0339	N/A	0.0228	
4/14/2021		N/A	N/A	N/A	N/A	0.0486	N/A	N/A	N/A	N/A	N/A	
9/8/2021		0.192	0.0211	0.0159	0.0125	0.029	0.01	0.0109	0.0215	N/A	0.0228	
9/8/2021		N/A	N/A	0.0171	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	0.0208	0.0185	N/A	0.0277	0.0099	0.00687	0.0185	N/A	0.0159	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.017	N/A	N/A	
6/24/2022		0.221	N/A	N/A	0.0136	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		0.249	0.0195	0.0181	0.00977	0.0325	0.0145	0.0103	0.0178	N/A	0.0206	
9/20/2022	0.176	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	0.194	0.0225	0.0191	0.0107	0.044	0.0112	0.0104	0.0205	N/A	0.0152		
2/8/2023	N/A	0.0225	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	0.023	0.018	N/A	0.039	N/A	0.013	0.0221	N/A	0.0177		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.0138	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	0.0118*	N/A	N/A	N/A	N/A		
5/14/2024	0.212	0.0218	0.0165	N/A	0.0546	0.0104	0.0098	0.0252	N/A	0.0174		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00952	N/A	N/A	N/A		
11/18/2024	N/A	0.0249	0.0216	N/A	0.0516	0.0133	0.0125	0.0435	N/A	0.0216		
11/18/2024	N/A	0.0255	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Beryllium, mg/L (CAS NO - 7440-41-7)	4/8/2008	0.0022	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A	< 0.001	< 0.001
	6/24/2008	< 0.001	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001
	9/17/2008	< 0.001	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001
	12/11/2008	0.0027	0.0184	0.0096	N/A	< 0.001	N/A	N/A	0.0034	N/A	< 0.001
	5/7/2009	0.0018	0.01	< 0.001	N/A	< 0.001	N/A	N/A	< 0.001	< 0.001	< 0.001
	10/23/2009	0.0019	0.0044	0.0042	N/A	< 0.001	N/A	N/A	< 0.001	< 0.001	< 0.001
	4/22/2010	< 0.001	0.0017	< 0.001	N/A	< 0.001	N/A	N/A	< 0.001	< 0.001	0.0013
	8/30/2010	0.0016	0.0084	< 0.001	< 0.001	< 0.001	N/A	N/A	< 0.001	< 0.001	< 0.001
	10/26/2010	0.0029	0.0059	< 0.001	< 0.001	< 0.001	N/A	N/A	< 0.001	< 0.001	< 0.001
	1/12/2011	N/A	N/A	< 0.001	N/A	< 0.001	N/A	N/A	N/A	N/A	< 0.001
	3/28/2011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0023	N/A	< 0.001	< 0.001	< 0.001
	7/19/2011	0.003	0.0143	< 0.001	< 0.001	< 0.001	0.0017	N/A	< 0.001	N/A	< 0.001
	10/25/2011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0013	N/A	< 0.001	N/A	< 0.001
	12/15/2011	N/A	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001
	4/16/2012	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	7/6/2012	N/A	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004
	9/26/2012	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	12/12/2012	< 0.004	N/A	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A
	4/24/2013	< 0.004	< 0.025	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/28/2013	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	< 0.004
	4/25/2014	0.0096	0.0126	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/20/2014	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	4/17/2015	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/12/2015	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	4/18/2016	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/25/2016	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	4/26/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/24/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	4/18/2018	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004
	10/24/2018	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.0063	< 0.004	N/A	< 0.004
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0057	N/A	N/A
	4/17/2019	< 0.004	< 0.004	< 0.004	0.0138	< 0.004	< 0.004	0.0044	< 0.004	N/A	< 0.004
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.0048	N/A	N/A	N/A
	10/23/2019	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.0059	< 0.004	N/A	< 0.004
	4/29/2020	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.006	< 0.004	N/A	< 0.004
	10/19/2020	< 0.004	< 0.004	< 0.004	0.0042	< 0.004	< 0.004	0.0063	< 0.004	N/A	< 0.004
	4/14/2021	0.000288*	< 0.001	< 0.001	0.0023*	< 0.001	0.00132*	0.0042	< 0.004	N/A	< 0.001
	4/14/2021	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	9/8/2021	< 0.001	< 0.001	< 0.001	0.00135*	< 0.001	< 0.004	0.00507	< 0.001	N/A	< 0.001
	9/8/2021	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.001	< 0.001	N/A	< 0.001	< 0.004	0.00494	< 0.001	N/A	< 0.001
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A
	6/24/2022	< 0.001	N/A	N/A	0.00123	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	0.000831*	< 0.001	< 0.001	0.00188	< 0.001	0.00363	0.00695	< 0.001	N/A	< 0.001
	9/20/2022	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 0.001	< 0.001	< 0.001	0.00193	< 0.001	0.000546*	0.00698	< 0.001	N/A	< 0.001
	2/8/2023	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	< 0.001	< 0.001	N/A	< 0.001	N/A	0.00682	< 0.001	N/A	< 0.001
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.00677	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A	N/A
5/14/2024	< 0.001	< 0.001	< 0.001	N/A	< 0.001	0.00176	0.00726	< 0.001	N/A	< 0.001	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00684	N/A	N/A	N/A	
11/18/2024	N/A	< 0.001	< 0.001	N/A	< 0.001	0.00264*	0.00774	< 0.001	N/A	< 0.001	
11/18/2024	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Cadmium, mg/L (CAS NO - 7440-43-9)	4/8/2008	< 0.005	N/A	0.0062	N/A	N/A	N/A	N/A	N/A	< 0.005	< 0.005
	6/24/2008	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
	9/17/2008	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
	10/27/2008	< 0.005	N/A	0.0229	N/A	< 0.005	N/A	N/A	N/A	N/A	< 0.005
	12/11/2008	< 0.005	< 0.005	0.0228	N/A	< 0.005	N/A	N/A	< 0.005	N/A	< 0.005
	5/7/2009	< 0.005	< 0.005	< 0.005	N/A	< 0.005	N/A	N/A	< 0.005	< 0.005	< 0.005
	10/23/2009	< 0.005	< 0.005	0.0102	N/A	< 0.005	N/A	N/A	< 0.005	0.0057	< 0.005
	4/22/2010	< 0.005	< 0.005	< 0.005	N/A	< 0.005	N/A	N/A	< 0.005	< 0.005	< 0.005
	8/30/2010	< 0.005	< 0.005	0.0079	< 0.005	< 0.005	N/A	N/A	< 0.005	< 0.005	< 0.005
	10/26/2010	0.0052	< 0.005	< 0.005	< 0.005	< 0.005	N/A	N/A	< 0.005	< 0.005	< 0.005
	1/12/2011	N/A	N/A	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	< 0.005
	3/28/2011	< 0.005	< 0.005	< 0.005	0.0087	< 0.005	0.0086	N/A	< 0.005	< 0.005	< 0.005
	7/19/2011	0.0059	< 0.005	< 0.005	< 0.005	< 0.005	0.0065	N/A	< 0.005	N/A	< 0.005
	10/25/2011	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005	N/A	< 0.005
	12/15/2011	N/A	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	< 0.005
	4/16/2012	< 0.0008	< 0.0008	< 0.0008	0.0024	< 0.0008	0.0013	N/A	< 0.0008	N/A	< 0.0008
	7/6/2012	N/A	< 0.0008	< 0.0008	0.0018	< 0.0008	0.0011	N/A	N/A	N/A	< 0.0008
	9/26/2012	< 0.0008	< 0.0008	< 0.0008	0.0017	< 0.0008	0.0038	N/A	< 0.0008	N/A	< 0.0008
	12/12/2012	< 0.0008	N/A	< 0.0008	0.0017	N/A	N/A	N/A	< 0.0008	N/A	N/A
	4/24/2013	< 0.0008	0.0033	< 0.0008	0.0017	< 0.0008	0.003	N/A	< 0.0008	N/A	< 0.0008
	10/28/2013	< 0.0008	< 0.0008	< 0.0008	0.0012	N/A	0.0038	N/A	< 0.0008	N/A	< 0.0008
	4/25/2014	0.0109	0.002	0.0051	0.0011	< 0.0008	0.0017	N/A	0.0013	N/A	< 0.0008
	10/20/2014	0.0034	< 0.0008	0.0013	0.0011	< 0.0008	0.0024	N/A	< 0.0008	N/A	< 0.0008
	4/17/2015	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0075	N/A	< 0.0008	N/A	< 0.0008
	10/12/2015	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0017	N/A	< 0.0008	N/A	< 0.0008
	4/18/2016	< 0.0008	< 0.0008	< 0.0008	< 0.0008	N/A	0.0066	N/A	< 0.0008	N/A	< 0.0008
	10/25/2016	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0039	N/A	< 0.0008	N/A	< 0.0008
	4/26/2017	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.002	N/A	< 0.0008	N/A	< 0.0008

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
<b>Total Metals Constituents</b>											
<b>Cadmium, mg/L (CAS NO - 7440-43-9)</b>											
	10/24/2017	< 0.0008	< 0.0008	< 0.0008	0.001	< 0.0008	0.007	N/A	< 0.0008	N/A	< 0.0008
	4/18/2018	< 0.0008	< 0.0008	< 0.0008	0.0011	< 0.0008	0.0078	N/A	< 0.0008	N/A	< 0.0008
	10/24/2018	< 0.0008	< 0.0008	< 0.0008	0.0016	< 0.0008	0.0077	0.0131	< 0.0008	N/A	< 0.0008
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.0088	N/A	N/A	N/A
	4/17/2019	< 0.0008	< 0.0008	< 0.0008	0.0038	< 0.0008	0.0061	0.0043	< 0.0008	N/A	< 0.0008
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.0045	N/A	N/A	N/A
	10/23/2019	< 0.0008	< 0.0008	< 0.0008	0.0011	< 0.0008	0.005	0.0069	< 0.0008	N/A	< 0.0008
	4/29/2020	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.0062	0.0052	< 0.0008	N/A	< 0.0008
	10/19/2020	< 0.0008	< 0.0008	< 0.0008	0.001	< 0.0008	0.0079	0.006	< 0.0008	N/A	< 0.0008
	4/14/2021	0.000317	< 0.0001	< 0.0001	0.00116	< 0.0001	0.00596	0.00432	0.000084*	N/A	0.000095*
	4/14/2021	N/A	N/A	N/A	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A
	9/8/2021	0.000216	< 0.0001	< 0.0001	0.0011	< 0.0001	0.00211	0.00441	< 0.0001	N/A	< 0.0001
	9/8/2021	N/A	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.0001	< 0.0001	N/A	< 0.0001	0.00178	0.00538	< 0.0001	N/A	< 0.0001
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0001	N/A	N/A
	6/24/2022	0.000361	N/A	N/A	0.000583	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	0.000381	< 0.0001	< 0.0001	0.000906	< 0.0001	0.00284	0.00648	< 0.0001	N/A	< 0.0001
	9/20/2022	0.000123	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	0.000101	< 0.0001	< 0.0001	0.00043	< 0.0001	0.00288	0.00539	< 0.0001	N/A	< 0.0001
	2/8/2023	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	0.000117*	0.000127*	N/A	< 0.0002	N/A	0.0105	0.000161*	N/A	< 0.0002
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.011	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	0.00398	N/A	N/A	N/A	N/A
	5/14/2024	0.000235	0.000196*	< 0.0002	N/A	< 0.0002	0.00332	0.0087	< 0.0002	N/A	0.000196*
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00956	N/A	N/A	N/A
	11/18/2024	N/A	0.000246	< 0.0002	N/A	0.000171*	0.00512	0.0122	< 0.0002	N/A	0.000131*
	11/18/2024	N/A	0.000176*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Chromium, mg/L (CAS NO - 7440-47-3)</b>											
	4/8/2008	0.0304	N/A	0.0115	N/A	N/A	N/A	N/A	N/A	0.0054	< 0.005
	6/24/2008	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
	9/17/2008	< 0.005	N/A	0.0161	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
	10/27/2008	0.033	N/A	0.0949	N/A	0.0051	N/A	N/A	N/A	N/A	< 0.005
	12/11/2008	0.0237	0.13	0.178	N/A	< 0.005	N/A	N/A	0.0548	N/A	< 0.005
	5/7/2009	0.0372	0.143	0.022	N/A	0.0066	N/A	N/A	0.0169	< 0.005	< 0.005
	10/23/2009	0.0191	0.0443	0.0299	N/A	< 0.005	N/A	N/A	< 0.005	0.0187	0.0125
	4/22/2010	0.0157	0.0236	0.0174	N/A	0.006	N/A	N/A	0.0135	< 0.005	0.0332
	8/30/2010	0.0371	0.128	0.0246	0.0836	< 0.005	N/A	N/A	0.0262	< 0.005	0.0109
	10/26/2010	0.0098	0.0137	0.0051	< 0.005	< 0.005	N/A	N/A	< 0.005	< 0.005	< 0.005
	1/12/2011	N/A	N/A	0.0058	N/A	< 0.005	N/A	N/A	N/A	N/A	0.0051
	3/28/2011	< 0.005	< 0.005	< 0.005	0.0389	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005
	7/19/2011	0.0415	0.144	< 0.005	< 0.005	< 0.005	< 0.005	N/A	0.0193	N/A	< 0.005
	10/25/2011	0.0052	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005	N/A	< 0.005
	12/15/2011	N/A	< 0.005	< 0.005	< 0.025	< 0.005	< 0.025	N/A	N/A	N/A	< 0.005
	4/16/2012	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	7/6/2012	N/A	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	N/A	N/A	< 0.008
	9/26/2012	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	12/12/2012	< 0.008	N/A	< 0.008	< 0.008	N/A	N/A	N/A	< 0.008	N/A	N/A
	4/24/2013	< 0.008	0.16	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	10/28/2013	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008	N/A	< 0.008
	4/25/2014	0.105	0.152	0.0416	< 0.008	0.0093	< 0.008	N/A	0.022	N/A	0.0105
	10/20/2014	0.0136	0.0319	< 0.008	< 0.008	< 0.008	< 0.008	N/A	0.0169	N/A	< 0.008
	4/17/2015	< 0.008	< 0.008	< 0.008	0.0168	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	10/12/2015	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	4/18/2016	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008	N/A	< 0.008
	10/25/2016	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	4/26/2017	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	10/24/2017	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	4/18/2018	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008	N/A	< 0.008
	10/24/2018	0.0081	< 0.008	< 0.008	0.0151	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 0.008	N/A	N/A	N/A
	4/17/2019	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 0.008	N/A	N/A	N/A
	10/23/2019	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008
	4/29/2020	< 0.008	< 0.008	< 0.008	0.183	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008
	10/19/2020	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	< 0.008	N/A	< 0.008
	4/14/2021	0.00729	< 0.005	< 0.02	< 0.02	< 0.005	< 0.02	< 0.005	< 0.02	N/A	< 0.005
	4/14/2021	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A
	9/8/2021	0.00146*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005
	9/8/2021	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A
	6/24/2022	< 0.005	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	0.00388*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00176*	< 0.005	N/A	< 0.005
	9/20/2022	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005
	2/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	< 0.005	< 0.005	N/A	< 0.005	N/A	< 0.005	< 0.005	N/A	< 0.005
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A
	5/14/2024	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	0.00257*	< 0.005	N/A	< 0.005
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/18/2024	N/A	< 0.005	< 0.005	N/A	< 0.005	< 0.02	< 0.005	0.00139*	N/A	< 0.005
	11/18/2024	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Cobalt, mg/L (CAS NO - 7440-48-4)	4/8/2008	0.0254	N/A	0.0195	N/A	N/A	N/A	N/A	N/A	0.0089	0.0178
	6/24/2008	0.0139	N/A	0.0459	N/A	N/A	N/A	N/A	N/A	N/A	0.0156
	9/17/2008	0.007	N/A	0.0463	N/A	N/A	N/A	N/A	N/A	N/A	0.0081
	10/27/2008	0.0216	N/A	0.135	N/A	0.0134	N/A	N/A	N/A	N/A	0.011
	12/11/2008	0.0233	0.216	0.0913	N/A	< 0.005	N/A	N/A	0.0438	N/A	0.0112
	5/7/2009	0.0408	0.148	0.0458	N/A	0.064	N/A	N/A	0.0122	< 0.005	0.022
	10/23/2009	0.0213	0.0435	0.0612	N/A	0.016	N/A	N/A	< 0.005	0.012	0.0444
	4/22/2010	0.0182	0.0182	0.0388	N/A	0.0326	N/A	N/A	0.0055	< 0.005	0.138
	8/30/2010	0.0332	0.125	0.0733	1.45	0.0322	N/A	N/A	0.0122	0.0084	0.0224
	10/26/2010	0.0487	0.0228	0.0562	1.47	0.0089	N/A	N/A	< 0.005	0.006	0.0097
	1/12/2011	N/A	N/A	0.0551	N/A	0.0089	N/A	N/A	N/A	N/A	0.0121
	3/28/2011	< 0.005	< 0.005	0.0709	0.771	< 0.005	1.59	N/A	< 0.005	< 0.005	0.0188
	7/19/2011	0.0465	0.147	0.0513	1.08	< 0.005	1.78	N/A	0.0095	N/A	0.0244
	10/25/2011	0.0054	< 0.005	0.0408	0.872	< 0.005	2.06	N/A	< 0.005	N/A	< 0.005
	12/15/2011	N/A	< 0.005	0.0404	1.06	< 0.005	1.29	N/A	N/A	N/A	< 0.005
	4/16/2012	0.0048	< 0.004	0.0152	1.04	0.0047	1.63	N/A	< 0.004	N/A	0.0446
	7/6/2012	N/A	< 0.004	0.0192	0.926	0.0041	1.43	N/A	N/A	N/A	< 0.004
	9/26/2012	< 0.004	0.0088	0.0134	0.639	< 0.004	1.43	N/A	< 0.004	N/A	< 0.004
	12/12/2012	< 0.004	N/A	0.0132	0.622	N/A	N/A	N/A	< 0.004	N/A	N/A
	4/24/2013	0.0135	0.241	0.0129	0.994	0.0504	1.3	N/A	0.0238	N/A	0.0085
	10/28/2013	0.0056	< 0.004	0.0218	1.45	N/A	2.02	N/A	0.0117	N/A	< 0.004
	4/25/2014	0.197	0.183	0.112	1.24	0.0758	1.52	N/A	0.0346	N/A	0.0381
	10/20/2014	0.0515	0.033	0.0361	1.16	0.0112	1.26	N/A	0.0118	N/A	0.0157
	4/17/2015	0.0014	< 0.0008	0.072	0.714	0.0129	0.642	N/A	0.0086	N/A	0.106
	10/12/2015	0.0013	0.0031	0.0982	1.2	0.006	1.18	N/A	0.0104	N/A	0.0447
	4/18/2016	0.002	0.0017	0.102	0.893	N/A	0.599	N/A	0.0065	N/A	0.0098
	10/25/2016	0.0022	< 0.0008	0.0716	0.888	0.0026	1.36	N/A	0.0073	N/A	0.0473
	4/26/2017	0.0008	< 0.0008	0.053	1.05	0.0059	1.35	N/A	0.0087	N/A	0.0208
	10/24/2017	0.0026	< 0.0008	0.0201	1.22	0.0039	0.591	N/A	0.0033	N/A	0.202
	4/18/2018	0.0029	< 0.0008	0.0073	1.48	0.0076	0.466	N/A	0.0081	N/A	0.131
	10/24/2018	0.0121	< 0.0008	0.0089	1.61	0.01	0.217	0.257	< 0.0008	N/A	0.199
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.311	N/A	N/A	N/A
	4/17/2019	0.0027	0.0009	0.0066	1.32	0.0062	0.361	0.137	0.0071	N/A	0.158
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.148	N/A	N/A	N/A
	10/23/2019	0.0026	0.0008	0.012	0.592	0.0075	0.698	0.199	0.001	N/A	0.146
	4/29/2020	0.0022	0.0004	< 0.0004	0.639	0.0067	0.449	0.162	0.0004	N/A	0.0722
	10/19/2020	0.0015	0.0008	< 0.0004	1.07	0.0064	1.59	0.188	0.0098	N/A	0.182
	4/14/2021	0.0162	0.000209*	< 0.002	1.08	0.011	0.758	0.135	0.00042*	N/A	0.168
	4/14/2021	N/A	N/A	N/A	N/A	0.0127	N/A	N/A	N/A	N/A	N/A
	9/8/2021	0.00466	< 0.0005	0.0234	1.05	0.0082	1.1	0.152	0.00232	N/A	0.185
	9/8/2021	N/A	N/A	0.000532	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.0005	0.482	N/A	0.00489	1.31	0.148	0.00538	N/A	0.0751
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00941	N/A	N/A
	6/24/2022	0.0103	N/A	N/A	1.27	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	0.00923	< 0.0005	0.166	1.24	0.00509	1.46	0.22	0.00884	N/A	0.168
	9/20/2022	0.00154	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	0.00413	0.000417*	0.116	1.29	0.00683	0.303	0.192	0.00715	N/A	0.189
2/8/2023	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	0.000445*	0.058	N/A	0.00452	N/A	0.264	0.00557	N/A	0.0664	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.265	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	0.916	N/A	N/A	N/A	N/A	
5/14/2024	0.0185	< 0.0005	< 0.0005	N/A	0.0092	0.833	0.251	0.005	N/A	0.0827	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	N/A	N/A	
11/18/2024	N/A	0.000229*	0.000618	N/A	0.00856	1.13	0.264	0.0062	N/A	0.00831	
11/18/2024	N/A	0.000304*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Copper, mg/L (CAS NO - 7440-50-8)	4/8/2008	0.0328	N/A	0.0501	N/A	N/A	N/A	N/A	N/A	0.035	0.0156
	6/24/2008	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	9/17/2008	< 0.01	N/A	0.0589	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01
	10/27/2008	0.034	N/A	0.336	N/A	0.012	N/A	N/A	N/A	N/A	0.0234
	12/11/2008	0.0322	0.195	0.178	N/A	< 0.01	N/A	N/A	0.14	N/A	< 0.01
	5/7/2009	0.0413	0.194	0.0671	N/A	0.023	N/A	N/A	0.0519	< 0.01	< 0.01
	10/23/2009	0.0329	0.0566	0.121	N/A	0.011	N/A	N/A	< 0.01	0.0405	0.15
	4/22/2010	0.0136	0.0257	0.0423	N/A	0.0127	N/A	N/A	0.0198	0.016	1.52
	8/30/2010	0.0343	0.127	N/A	0.0342	0.0134	N/A	N/A	0.0361	0.0045	0.0132
	10/26/2010	0.0411	0.0295	0.0118	< 0.01	< 0.01	N/A	N/A	< 0.01	0.0143	< 0.01
	1/12/2011	N/A	N/A	< 0.01	N/A	< 0.01	N/A	N/A	N/A	N/A	0.0359
	3/28/2011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0114	N/A	< 0.01	< 0.01	< 0.01
	7/19/2011	0.0561	0.192	< 0.01	0.0223	< 0.01	0.0186	N/A	0.0349	N/A	0.0166
	10/25/2011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	< 0.01	N/A	< 0.01
	12/15/2011	N/A	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01
	4/16/2012	< 0.004	0.0068	< 0.004	0.0072	0.0046	0.0055	N/A	< 0.004	N/A	< 0.004
	7/6/2012	N/A	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004
	9/26/2012	< 0.004	0.0076	< 0.004	< 0.004	< 0.004	0.0102	N/A	< 0.004	N/A	< 0.004
	12/12/2012	< 0.004	N/A	0.0047	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A
	4/24/2013	< 0.004	0.239	0.0078	0.0133	0.0108	0.0227	N/A	0.0079	N/A	0.128
	10/28/2013	< 0.004	< 0.004	< 0.004	< 0.004	N/A	0.0079	N/A	0.0042	N/A	< 0.004
	4/25/2014	0.148	0.169	0.226	0.0061	0.0185	0.0104	N/A	0.0188	N/A	0.272
	10/20/2014	0.0174	0.0308	0.0132	0.0048	0.0139	0.0065	N/A	0.0404	N/A	0.0072
	4/17/2015	< 0.004	< 0.004	< 0.004	< 0.004	0.0124	< 0.004	N/A	< 0.004	N/A	0.0082
	10/12/2015	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	0.0091
	4/18/2016	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	0.006
10/25/2016	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.0061	N/A	< 0.004	N/A	< 0.004	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Copper, mg/L (CAS NO - 7440-50-8)	4/26/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
	10/24/2017	< 0.004	< 0.004	< 0.004	0.0064	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
	4/18/2018	< 0.004	< 0.004	< 0.004	0.0198	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
	10/24/2018	0.0283	< 0.004	< 0.004	0.104	0.0098	0.0372	0.0619	< 0.004	N/A	0.0159	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.0106	N/A	N/A	N/A	
	4/17/2019	< 0.004	< 0.004	< 0.004	0.0437	< 0.004	< 0.004	0.0155	< 0.004	N/A	0.0193	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	0.0144	N/A	N/A	N/A	
	10/23/2019	< 0.004	< 0.004	0.0206	0.0041	< 0.004	0.0062	0.0118	< 0.004	N/A	0.0104	
	4/29/2020	< 0.004	0.0041	0.0049	0.0138	< 0.004	< 0.004	0.0052	< 0.004	N/A	0.0075	
	10/19/2020	< 0.004	< 0.004	< 0.004	0.0131	< 0.004	0.0055	0.0066	< 0.004	N/A	0.0105	
	4/14/2021	0.00427*	< 0.005	< 0.02	0.00692*	< 0.005	< 0.02	0.00407*	< 0.02	N/A	0.0047*	
	4/14/2021	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	< 0.005	0.00341*	< 0.005	0.00376*	< 0.005	< 0.005	0.00625	< 0.005	N/A	< 0.005	
	9/8/2021	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	
	6/24/2022	< 0.005	N/A	N/A	0.00298*	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	0.0101	< 0.005	< 0.005	0.00374*	< 0.005	0.00537	0.0145	< 0.005	N/A	< 0.005	
	9/20/2022	0.00331*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	< 0.005	< 0.005	< 0.005	0.00223*	< 0.005	< 0.005	0.00805	< 0.005	N/A	< 0.005	
	2/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	< 0.005	< 0.005	N/A	0.00189*	N/A	0.00804	< 0.005	N/A	< 0.005	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.00665	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A	
	5/14/2024	< 0.005	< 0.005	< 0.005	N/A	< 0.005	0.00419*	0.0108	< 0.005	N/A	< 0.005	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00885	N/A	N/A	N/A	
	11/18/2024	N/A	< 0.005	< 0.005	N/A	0.0022*	< 0.02	0.00338*	< 0.005	N/A	< 0.005	
	11/18/2024	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Lead, mg/L (CAS NO - 7439-92-1)	4/8/2008	0.0221	N/A	0.0253	N/A	N/A	N/A	N/A	N/A	< 0.005	< 0.005
		6/24/2008	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
		9/17/2008	< 0.005	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005
		10/27/2008	0.0283	N/A	0.188	N/A	0.0137	N/A	N/A	N/A	N/A	0.005
		12/11/2008	0.0256	0.142	0.208	N/A	< 0.005	N/A	N/A	0.097	N/A	< 0.005
5/7/2009		0.0237	0.104	0.0271	N/A	0.0158	N/A	N/A	0.0213	< 0.005	< 0.005	
10/23/2009		0.0266	0.0388	0.0961	N/A	0.0103	N/A	N/A	< 0.005	0.0379	0.0153	
4/22/2010		0.0122	0.0194	0.0214	N/A	0.0142	N/A	N/A	0.0159	< 0.005	0.0427	
8/30/2010		0.0304	0.104	0.0827	0.0606	0.0172	N/A	N/A	0.0335	< 0.005	0.0136	
10/26/2010		0.0269	0.0188	0.009	0.03	0.0087	N/A	N/A	0.0099	0.0094	< 0.005	
1/12/2011		N/A	N/A	0.007	N/A	0.0056	N/A	N/A	N/A	N/A	0.0125	
3/28/2011		< 0.005	< 0.005	< 0.005	0.0288	< 0.005	0.0189	N/A	< 0.005	< 0.005	< 0.005	
7/19/2011		0.0422	0.115	< 0.005	< 0.005	< 0.005	0.0112	N/A	0.0227	N/A	< 0.005	
10/25/2011		0.0051	< 0.005	0.0075	< 0.005	< 0.005	0.0158	N/A	< 0.005	N/A	< 0.005	
12/15/2011		N/A	< 0.005	0.0059	0.0253	< 0.005	0.0186	N/A	N/A	N/A	< 0.005	
4/16/2012		< 0.004	0.0051	< 0.004	0.0129	0.0056	< 0.004	N/A	< 0.004	N/A	< 0.004	
7/6/2012		N/A	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	
9/26/2012		< 0.004	0.0067	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
12/12/2012		< 0.004	N/A	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	
4/24/2013		< 0.004	0.138	< 0.004	0.0051	0.0072	0.0052	N/A	0.0042	N/A	< 0.004	
10/28/2013		< 0.004	0.0253	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	0.004	
4/25/2014		0.0851	0.128	0.0502	< 0.004	0.0242	< 0.004	N/A	0.0456	N/A	0.0116	
10/20/2014		0.0137	0.0225	0.007	< 0.004	0.0188	< 0.004	N/A	0.0306	N/A	< 0.004	
4/17/2015		< 0.004	< 0.004	< 0.004	< 0.004	0.0173	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/12/2015		< 0.004	< 0.004	< 0.004	< 0.004	0.0072	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/18/2016		< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/25/2016		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/26/2017		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/24/2017		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/18/2018		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/24/2018		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A	
4/17/2019		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A	
10/23/2019		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
4/29/2020		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
10/19/2020		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
4/14/2021		0.00303	< 0.0005	0.000579	0.00159*	0.00201	< 0.002	0.000325*	0.000844*	N/A	0.000439*	
4/14/2021		N/A	N/A	N/A	N/A	0.00158	N/A	N/A	N/A	N/A	N/A	
9/8/2021		0.000539	< 0.0005	< 0.0005	0.00102	0.000352*	0.000258*	0.000343*	< 0.0005	N/A	< 0.0005	
9/8/2021		N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	< 0.0005	< 0.0005	N/A	< 0.0005	0.000408*	0.000324*	< 0.0005	N/A	< 0.0005	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	
6/24/2022	0.000948	N/A	N/A	0.0012	N/A	N/A	N/A	N/A	N/A	N/A		
9/20/2022	0.00594	< 0.0005	< 0.0005	0.0015	< 0.0005	0.00399	0.00066	< 0.0005	N/A	< 0.0005		
9/20/2022	0.00124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	0.00121	< 0.0005	0.000256*	0.000721	0.00203	< 0.0005	0.000336*	< 0.0005	N/A	< 0.0005		
2/8/2023	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	0.000305*	0.000243*	N/A	0.00236	N/A	0.000433*	< 0.0005	N/A	< 0.0005		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.000372*	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A		
5/14/2024	0.000902	< 0.0005	< 0.0005	N/A	< 0.0005	0.000567	0.000331*	< 0.0005	N/A	< 0.0005		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.000286*	N/A	N/A	N/A		





# SCS ENGINEERS

## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Selenium, mg/L (CAS NO - 7782-49-2)	4/18/2016	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	< 0.004	
	10/25/2016	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
	4/26/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	< 0.004	
	10/24/2017	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	< 0.004	
	4/18/2018	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.004	N/A	< 0.004	< 0.004	
	10/24/2018	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.0068	< 0.004	N/A	< 0.004
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0067	N/A	N/A	N/A
	4/17/2019	< 0.004	< 0.004	< 0.004	< 0.004	0.026	< 0.004	< 0.004	0.0052	< 0.004	N/A	< 0.004
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0056	N/A	N/A	N/A
	10/23/2019	< 0.004	< 0.004	< 0.004	< 0.004	0.0042	< 0.004	< 0.004	0.0058	< 0.004	N/A	< 0.004
	4/29/2020	< 0.004	< 0.004	< 0.004	< 0.004	0.0093	< 0.004	< 0.004	0.0084	< 0.004	N/A	< 0.004
	10/19/2020	< 0.004	< 0.004	< 0.004	< 0.004	0.0044	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004
	4/14/2021	< 0.005	< 0.005	< 0.02	0.00558*	< 0.005	< 0.02	0.00137*	< 0.02	N/A	N/A	0.00117*
	4/14/2021	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A
	9/8/2021	< 0.005	< 0.005	< 0.005	0.00531	< 0.005	0.0018*	0.00233*	< 0.005	N/A	N/A	< 0.005
	9/8/2021	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 0.005	0.00203*	N/A	< 0.005	0.0015*	0.00218*	< 0.005	N/A	N/A	< 0.005
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	6/24/2022	< 0.005	N/A	N/A	N/A	0.00438*	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	< 0.005	< 0.005	< 0.005	0.00522	< 0.005	0.00328*	0.00421*	< 0.005	N/A	N/A	< 0.005
	9/20/2022	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 0.005	< 0.005	< 0.005	0.00642	< 0.005	0.00118*	0.00367*	< 0.005	N/A	N/A	< 0.005
	2/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	< 0.005	< 0.005	N/A	< 0.005	N/A	0.00311*	< 0.005	N/A	N/A	< 0.005
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.00307*	< 0.005	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A
	5/14/2024	< 0.005	< 0.005	< 0.005	N/A	< 0.005	0.0054	0.00518	< 0.005	N/A	N/A	< 0.005
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.00463*	N/A	N/A	N/A	N/A
	11/18/2024	N/A	< 0.005	< 0.005	N/A	< 0.005	0.00532	0.00626	< 0.005	N/A	N/A	< 0.005
	11/18/2024	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Silver, mg/L (CAS NO - 7440-22-4)	4/8/2008	< 0.007	N/A	< 0.007	N/A	N/A	N/A	N/A	N/A	< 0.007	< 0.007
		6/24/2008	< 0.007	N/A	< 0.007	N/A	N/A	N/A	N/A	N/A	N/A	< 0.007
		9/17/2008	< 0.007	N/A	< 0.007	N/A	N/A	N/A	N/A	N/A	N/A	< 0.007
		10/27/2008	< 0.007	N/A	< 0.007	N/A	< 0.007	N/A	N/A	N/A	N/A	< 0.007
		12/11/2008	< 0.007	< 0.007	< 0.007	N/A	< 0.007	N/A	N/A	< 0.007	N/A	< 0.007
		5/7/2009	< 0.007	< 0.007	< 0.007	N/A	< 0.007	N/A	N/A	< 0.007	< 0.007	< 0.007
		10/23/2009	< 0.007	< 0.007	< 0.007	N/A	< 0.007	N/A	N/A	< 0.007	< 0.007	< 0.007
		4/22/2010	< 0.007	< 0.007	< 0.007	N/A	< 0.007	N/A	N/A	< 0.007	< 0.007	< 0.007
		8/30/2010	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	N/A	N/A	< 0.007	< 0.007	< 0.007
		10/26/2010	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	N/A	N/A	< 0.007	< 0.007	< 0.007
1/12/2011		N/A	N/A	< 0.007	N/A	< 0.007	N/A	N/A	N/A	N/A	< 0.007	
3/28/2011		< 0.007	< 0.007	< 0.007	0.0141	< 0.007	0.0155	N/A	< 0.007	< 0.007	< 0.007	
7/19/2011		< 0.007	< 0.007	< 0.007	0.0095	< 0.007	< 0.007	N/A	< 0.007	N/A	< 0.007	
10/25/2011		< 0.007	< 0.007	< 0.007	0.0245	< 0.007	< 0.007	N/A	< 0.007	N/A	< 0.007	
12/15/2011		N/A	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	N/A	N/A	N/A	< 0.007	
4/16/2012		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
7/6/2012		N/A	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	
9/26/2012		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
12/12/2012		< 0.004	N/A	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	
4/24/2013		< 0.004	< 0.01	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/28/2013		< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/25/2014		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/20/2014		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/17/2015		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/12/2015		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/18/2016		< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/25/2016		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/26/2017		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/24/2017		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
4/18/2018		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	N/A	< 0.004	
10/24/2018		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
4/17/2019		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
10/23/2019		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004
4/29/2020		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004
10/19/2020		< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	N/A	< 0.004
4/14/2021		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.004	N/A	< 0.001
4/14/2021		N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
9/8/2021		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001
9/8/2021	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022	N/A	< 0.001	0.000902*	N/A	< 0.001	< 0.004	< 0.001	< 0.004	< 0.004	N/A	< 0.001	
5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A	
6/24/2022	< 0.001	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001	
9/20/2022	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001	
2/8/2023	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	< 0.001	< 0.001	N/A	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	< 0.001	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	< 0.001	
9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A	N/A	



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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Total Metals Constituents Vanadium, mg/L (CAS NO - 7440-62-2)	10/12/2015	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	< 0.02	
	4/18/2016	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	< 0.02	N/A	< 0.02	
	10/25/2016	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	< 0.02	
	4/26/2017	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	< 0.02	
	10/24/2017	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	
	4/18/2018	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	
	10/24/2018	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	
	4/17/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	
	10/23/2019	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	
	4/29/2020	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	
	10/19/2020	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A	
	4/14/2021	0.00752	< 0.005	< 0.02	< 0.02	< 0.02	< 0.005	< 0.02	< 0.005	< 0.02	N/A	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	
	9/8/2021	0.00111*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	
	9/8/2021	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	
	6/24/2022	0.00146*	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	0.00873	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	
	9/20/2022	0.00141*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	0.00145*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	
	2/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	< 0.005	< 0.005	N/A	< 0.005	N/A	< 0.005	< 0.005	< 0.005	N/A	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A	
	5/14/2024	0.00157*	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	N/A	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	
	11/18/2024	N/A	< 0.005	< 0.005	N/A	< 0.005	< 0.02	< 0.005	0.00122*	N/A	< 0.005	
	11/18/2024	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Zinc, mg/L (CAS NO - 7440-66-6)	4/8/2008	0.2	N/A	0.293	N/A	N/A	N/A	N/A	N/A	< 0.05	< 0.05
		6/24/2008	< 0.05	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05
		9/17/2008	< 0.05	N/A	0.433	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05
		10/27/2008	0.18	N/A	2.3	N/A	< 0.05	N/A	N/A	N/A	N/A	< 0.05
		12/11/2008	0.176	0.676	0.989	N/A	< 0.05	N/A	N/A	0.328	N/A	< 0.05
		5/7/2009	0.202	0.586	0.307	N/A	0.0575	N/A	N/A	0.104	< 0.05	< 0.05
		10/23/2009	0.175	0.201	0.716	N/A	< 0.05	N/A	N/A	< 0.05	0.0729	0.219
		4/22/2010	0.111	0.0901	0.276	N/A	0.0742	N/A	N/A	0.0783	< 0.05	0.844
		8/30/2010	0.203	0.484	0.556	0.208	0.121	N/A	N/A	0.142	< 0.05	0.0284
		10/26/2010	0.314	0.0782	0.17	0.17	< 0.05	N/A	N/A	< 0.05	< 0.05	< 0.05
		1/12/2011	N/A	N/A	0.0709	N/A	< 0.05	N/A	N/A	N/A	N/A	0.102
		3/28/2011	< 0.05	< 0.05	0.124	0.102	< 0.05	0.972	N/A	< 0.05	< 0.05	< 0.05
		7/19/2011	0.32	0.63	0.0617	0.129	< 0.05	0.897	N/A	0.105	N/A	< 0.05
		10/25/2011	< 0.05	< 0.05	< 0.05	0.106	< 0.05	1.01	N/A	0.0575	N/A	< 0.05
12/15/2011		N/A	< 0.05	0.0366	< 0.25	< 0.05	0.708	N/A	N/A	N/A	< 0.05	
4/16/2012		< 0.02	< 0.02	0.0244	< 0.02	< 0.02	0.651	N/A	0.0893	N/A	< 0.02	
7/6/2012		N/A	0.0242	0.0316	0.135	0.0212	0.615	N/A	N/A	N/A	0.0161	
9/26/2012		0.0086	0.0257	0.025	0.113	< 0.008	0.729	N/A	0.101	N/A	< 0.008	
12/12/2012		< 0.008	N/A	0.0113	0.108	N/A	N/A	N/A	0.0502	N/A	N/A	
4/24/2013		0.0249	1.16	0.0499	0.112	0.0305	0.446	N/A	0.0661	N/A	0.0745	
10/28/2013		0.0211	< 0.008	0.018	0.132	N/A	0.696	N/A	< 0.008	N/A	< 0.008	
4/25/2014		0.864	0.697	2.33	0.117	0.0464	0.527	N/A	0.33	N/A	0.185	
10/20/2014		0.134	0.115	0.103	0.0984	0.0789	0.455	N/A	0.159	N/A	0.0097	
4/17/2015		< 0.008	< 0.008	0.0446	0.0767	0.0503	0.566	N/A	0.0745	N/A	0.0087	
10/12/2015		0.0092	0.0155	0.134	0.131	0.019	0.439	N/A	0.0638	N/A	0.0146	
4/18/2016		0.0144	0.0083	0.154	0.0889	N/A	0.487	N/A	0.0616	N/A	< 0.008	
10/25/2016		< 0.008	< 0.008	0.0394	0.0985	0.0093	0.702	N/A	0.0473	N/A	< 0.008	
4/26/2017		< 0.02	< 0.02	< 0.02	0.105	< 0.02	0.506	N/A	0.0433	N/A	< 0.02	
10/24/2017		< 0.02	< 0.02	< 0.02	0.13	< 0.008	0.625	N/A	0.0337	N/A	< 0.008	
4/18/2018		< 0.008	< 0.008	< 0.008	0.142	0.0208	0.648	N/A	0.0523	N/A	< 0.008	
10/24/2018		0.0484	< 0.02	< 0.02	0.169	0.0307	0.651	0.512	< 0.02	N/A	< 0.02	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	0.441	N/A	N/A	N/A	
4/17/2019		0.0082	< 0.008	0.0489	0.231	0.0205	0.539	0.276	0.068	N/A	0.0118	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	0.29	N/A	N/A	N/A	
10/23/2019		< 0.02	< 0.02	0.167	0.0898	< 0.02	0.583	0.401	0.0414	N/A	< 0.02	
4/29/2020		< 0.02	< 0.02	< 0.02	0.121	< 0.02	0.567	0.457	0.0292	N/A	< 0.02	
10/19/2020		< 0.02	< 0.02	< 0.02	0.2	< 0.02	1.11	0.483	0.0365	N/A	< 0.02	
4/14/2021		0.0289	< 0.02	< 0.08	0.193	0.0153*	0.669	0.227	< 0.08	N/A	< 0.02	
4/14/2021		N/A	N/A	N/A	N/A	0.0178*	N/A	N/A	N/A	N/A	N/A	
9/8/2021		0.0114*	< 0.02	< 0.02	0.18	0.011*	0.554	0.231	< 0.02	N/A	< 0.02	
9/8/2021		N/A	N/A	0.0334	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	< 0.02	0.188	N/A	< 0.02	0.537	0.307	0.0188*	N/A	< 0.02	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.044	N/A	N/A	
6/24/2022		< 0.02	N/A	N/A	0.132	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		0.038	< 0.02	0.0111*	0.176	< 0.02	0.685	0.448	0.0383	N/A	< 0.02	
9/20/2022	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	< 0.02	< 0.02	0.026	0.173	0.0109*	0.294	0.206	0.0288	N/A	< 0.02		
2/8/2023	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	< 0.02	0.0132*	N/A	0.0221	N/A	0.412	0.0334	N/A	0.00828*		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.451	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	0.739	N/A	N/A	N/A	N/A		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Total Metals Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Zinc, mg/L (CAS NO - 7440-66-6)	5/14/2024	< 0.02	< 0.02	< 0.02	N/A	0.0122*	0.585	0.296	0.0288	N/A	< 0.02
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	0.319	N/A	N/A	N/A
	11/18/2024	N/A	< 0.02	< 0.02	N/A	0.0154*	0.868	0.529	0.0313	N/A	< 0.02
	11/18/2024	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Suspended Solids, mg/L (CAS NO - TSS)	4/14/2021	98	7.38	15.6	8.37	42.5	1.75*	1*	125	N/A	78.7
	4/14/2021	N/A	N/A	N/A	N/A	29.5	N/A	N/A	N/A	N/A	N/A
	9/8/2021	13.4	< 1.88	12.1	6.75	9.25	8.88	< 1.88	46.4	N/A	26.4
	9/8/2021	N/A	N/A	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	3.33*	11	N/A	12	16	2.33*	110	N/A	80
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	124	N/A	N/A
	6/24/2022	41.7	N/A	N/A	8	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	344	1*	20	8.67	8.25	21.5	3	65	N/A	57
	9/20/2022	2050	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	198	12.1	42	10.3	44	5.13	1.88	93	N/A	36
	2/8/2023	N/A	33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	19	25.3	N/A	39.7	N/A	1.88	127	N/A	13.3
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	1.88	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	2.33*	N/A	N/A	N/A	N/A
	5/14/2024	N/A	< 1.88	26.5	N/A	34.5	8.6	< 1.88	93	N/A	30
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 1.88	N/A	N/A	N/A
	11/18/2024	N/A	9.25	7.38	N/A	62	2.5	< 1.88	60	N/A	8.75
	11/18/2024	N/A	12.9	N/A	N/A	N/A	N/A	N/A	N/A	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.

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
1,1,1,2-Tetrachloroethane, ug/L (CAS NO - 630-20-6)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	8/30/2010	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A
	9/26/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	12/12/2012	<1	N/A	<1	<1	<1	N/A	N/A	N/A	<1	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/28/2013	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	<1	N/A	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	<1	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A
	9/26/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	12/12/2012	<1	N/A	<1	<1	<1	N/A	N/A	N/A	<1	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/28/2013	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A	<1
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<1	<1	N/A	N/A	<1	N/A	<1	<1	N/A	<1
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	<1
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	<1
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1,1,2,2-Tetrachloroethane, ug/L (CAS NO - 79-34-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
4/16/2012		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N/A	<0.2	N/A	<0.2
7/6/2012		N/A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N/A	N/A	N/A	<0.2
9/26/2012		<0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.08	N/A	<0.08	N/A	<0.1
12/12/2012		<0.08	N/A	<0.08	<0.08	N/A	N/A	N/A	N/A	<0.08	N/A	N/A
4/24/2013		<2	<1	<1	<1	<1	<0.1	<1	N/A	<1	N/A	<1
10/28/2013		<2	<1	<1	<1	<2	N/A	<1	N/A	<2	N/A	<1
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2016		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/19/2022		N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A	<1
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9/20/2022		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
9/20/2022		<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	<1	N/A	<1	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	<1	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	<1	
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
1,1,2-Trichloroethane, ug/L (CAS NO - 79-00-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	8/30/2010	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	<1	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	<1	N/A	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	4.3	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	3.5	2.5
	10/27/2008	<1	N/A	<1	N/A	2.5	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	3.3	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	4.8	N/A	N/A	<1	8.1	<1
	10/23/2009	<1	<1	<1	N/A	3.8	N/A	N/A	<1	6.1	1
	4/22/2010	<1	<1	<1	N/A	3.1	N/A	N/A	<1	7.5	<1
	8/30/2010	<1	<1	<1	<1	2.8	N/A	N/A	<1	N/A	<1
	10/26/2010	N/A	<1	<1	<1	2.1	N/A	N/A	<1	5.1	N/A
	1/12/2011	N/A	N/A	<1	N/A	2.2	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	2.4	<1	N/A	<1	4.4	<1
	7/19/2011	<1	<1	<1	<1	1.9	<1	N/A	<1	N/A	<1
	10/25/2011	<1	<1	<1	<1	1.3	<1	N/A	<1	N/A	<1
	12/15/2011	N/A	<1	<1	<1	1.6	<1	N/A	N/A	N/A	1.5
	4/16/2012	<1	<1	<1	1.4	1.4	<1	N/A	<1	N/A	1.5
	7/6/2012	N/A	<1	<1	<1	1.8	<1	N/A	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	1.6	<1	N/A	<1	N/A	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/20/2014	<1	<1	<1	<1	1.7	<1	N/A	<1	N/A	<1	
4/17/2015	<1	<1	<1	<1	1.4	<1	N/A	<1	N/A	<1	
10/12/2015	<1	<1	<1	<1	1	<1	N/A	<1	N/A	<1	
4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016	<1	<1	<1	<1	1.2	<1	N/A	<1	N/A	<1	



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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	4/26/2017	<1	<1	<1	<1	1.8	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	1.6	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	2.3	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	3.8	<1	<1	<1	N/A	2.3	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	2.2	<1	<1	<1	N/A	1.1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	1.4	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	2.24	<1	<1	<1	N/A	0.627*	
	4/14/2021	N/A	N/A	N/A	N/A	2.13	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	1.48	<1	<1	<1	N/A	0.409*	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	0.806*	<1	<1	<1	N/A	0.284*	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	0.532*	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	1.11	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	N/A	0.903*	N/A	<1	<1	N/A	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	N/A	2.43	<1	<1	<1	N/A	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	N/A	1.49	<1	<1	<1	N/A	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	<1	<1
12/11/2008		<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	2.6	<1	
10/26/2010		N/A	<1	<1	<1	2.1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	<1	N/A	<1	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	<1	N/A	<1	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
4/14/2021		N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
9/8/2021		N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	
6/24/2022		<2	N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
9/20/2022		<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
2/8/2023		N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023		N/A	<2	<2	N/A	<2	N/A	<2	<2	N/A	<2	
8/23/2023		N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
<b>1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)</b>	11/18/2024	N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2
	11/18/2024	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>1,2,3-Trichloropropane, ug/L (CAS NO - 96-18-4)</b>	4/8/2008	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	N/A	<2.5	<2.5
	9/17/2008	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	N/A	<2.5	<2.5
	10/27/2008	<2.5	N/A	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	<2.5
	12/11/2008	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	N/A	<2.5
	5/7/2009	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	10/23/2009	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	4/22/2010	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	8/30/2010	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	10/26/2010	N/A	<2.5	<2.5	<2.5	<2.5	N/A	N/A	<2.5	N/A	N/A
	1/12/2011	N/A	N/A	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	<2.5
	3/28/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	7/19/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	10/25/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	12/15/2011	N/A	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	N/A	<2.5
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	12/12/2012	<1	N/A	<1	<1	<1	N/A	N/A	N/A	<1	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/28/2013	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	<1	N/A
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
<b>1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)</b>	4/8/2008	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	N/A	<2.5	<2.5
	9/17/2008	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	N/A	<2.5	<2.5
	10/27/2008	<2.5	N/A	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	<2.5
	12/11/2008	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	N/A	<2.5
	5/7/2009	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	10/23/2009	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	4/22/2010	<2.5	<2.5	<2.5	N/A	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	8/30/2010	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	N/A	<2.5	<2.5	<2.5
	10/26/2010	N/A	<2.5	<2.5	<2.5	<2.5	N/A	N/A	<2.5	N/A	N/A
	1/12/2011	N/A	N/A	<2.5	N/A	<2.5	N/A	N/A	N/A	N/A	<2.5
	3/28/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	7/19/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	10/25/2011	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	N/A	<2.5	<2.5
	12/15/2011	N/A	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	N/A	N/A	<0.029
	4/16/2012	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N/A	<0.02	<0.02
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1
	9/26/2012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	<0.01	<0.01
	12/12/2012	<0.02	N/A	<0.02	<0.02	N/A	N/A	N/A	N/A	<0.02	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/28/2013	<2	<1	<1	<2	N/A	<1	<1	N/A	<2	N/A
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	4/14/2021	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	9/8/2021	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	
	6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	N/A	<5	N/A	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	
	11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	1,2-Dibromoethane [EDB], ug/L (CAS NO - 106-93-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	N/A	N/A	<0.029	
4/16/2012		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N/A	<0.02	N/A	
7/6/2012		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N/A	N/A	<0.02	
9/26/2012		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	N/A	<0.02	N/A	
12/12/2012		<0.02	N/A	<0.02	<0.02	N/A	N/A	N/A	<0.02	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/28/2013		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	
10/24/2017		N/A	N/A	N/A	N/A	<1	<1	N/A	N/A	N/A	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/20/2022		<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/8/2023		N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A		
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1,2-Dichlorobenzene, ug/L (CAS NO - 95-50-1)	4/8/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	<1	<1	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,2-Dichlorobenzene, ug/L (CAS NO - 95-50-1)	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/28/2013	<2	<1	<1	<2	N/A	<1	N/A	<2	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	1,2-Dichloropropane, ug/L (CAS NO - 78-87-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
10/27/2008		<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
12/11/2008		<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/14/2021		N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/20/2022		<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
1,4-Dichlorobenzene, ug/L (CAS NO - 106-46-7)	4/8/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	<1	1.3	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	2.1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	5.1	1.6	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	1	
3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	1.9		
7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	1.8		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
1,4-Dichlorobenzene, ug/L (CAS NO - 106-46-7)	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.9	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/28/2013	<2	<1	<1	<1	<2	N/A	<1	N/A	<2	N/A	<1
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.2
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.4
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.8
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.6
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	3.4
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.8
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4.4
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4.1
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	2.7
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4.6
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4.62
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	7.87
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	5.2
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	8.85
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	8.13
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	N/A	<1	N/A	4.86
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	7.86
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	N/A	5.7
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2-Butanone, ug/L (CAS NO - 78-93-3)	4/8/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10	<10
		6/24/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10	<10
		9/17/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10	<10
		10/27/2008	<10	N/A	<10	N/A	<1	N/A	N/A	N/A	N/A	<10
		12/11/2008	<10	<10	<10	N/A	<10	N/A	N/A	<10	N/A	<10
		5/7/2009	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10
		10/23/2009	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10
		4/22/2010	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10
8/30/2010		<10	<10	<10	<10	<10	N/A	N/A	<10	<10	<10	
10/26/2010		N/A	<10	<10	<10	<10	N/A	N/A	<10	N/A	N/A	
1/12/2011		N/A	N/A	<10	N/A	<10	N/A	N/A	N/A	N/A	<10	
3/28/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	
7/19/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	
10/25/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	
12/15/2011		N/A	<10	<10	<10	<10	<10	<10	N/A	N/A	<10	
4/16/2012		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
7/6/2012		N/A	<5	<5	<5	<5	<5	<5	N/A	N/A	<5	
9/26/2012		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
12/12/2012		<5	N/A	<5	<5	<5	N/A	N/A	N/A	<5	N/A	
4/24/2013		<10	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
10/28/2013		<5	<5	<5	<5	<5	N/A	<5	N/A	<5	<5	
4/25/2014		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
10/20/2014		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
4/17/2015		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
10/12/2015		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
4/18/2016		<5	<5	<5	<5	<5	N/A	<5	N/A	<5	<5	
10/25/2016		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
4/26/2017		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
10/24/2017		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
4/18/2018		<5	<5	<5	<5	<5	<5	<5	N/A	<5	<5	
10/24/2018		<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
4/17/2019		<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
10/23/2019		<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
4/29/2020		<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
10/19/2020		<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
4/14/2021		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
4/14/2021		N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
2-Butanone, ug/L (CAS NO - 78-93-3)	9/8/2021	3.1*	< 10	< 10	20.3	2.58*	< 10	2.16*	< 10	N/A	< 10
	9/8/2021	N/A	N/A	3.37*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	6/24/2022	< 10	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10
	9/20/2022	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10
	2/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	< 10	< 10	N/A	< 10	N/A	< 10	< 10	N/A	< 10
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A
	5/14/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A
	11/18/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10
	11/18/2024	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2-Hexanone, ug/L (CAS NO - 591-78-6)	4/8/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	6/24/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	9/17/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	10/27/2008	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A	N/A	< 10
	12/11/2008	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	N/A	< 10
	5/7/2009	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	10/23/2009	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	4/22/2010	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	8/30/2010	< 10	< 10	< 10	< 10	< 10	N/A	N/A	< 10	< 10	< 10
	10/26/2010	N/A	< 10	< 10	< 10	< 10	N/A	N/A	< 10	N/A	N/A
	1/12/2011	N/A	N/A	< 10	N/A	< 10	N/A	N/A	N/A	N/A	< 10
	3/28/2011	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10
	7/19/2011	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	N/A	< 10
	10/25/2011	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	N/A	< 10
	12/15/2011	N/A	< 10	< 10	< 10	< 10	< 10	N/A	N/A	N/A	< 10
	4/16/2012	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	7/6/2012	N/A	< 5	< 5	< 5	< 5	< 5	N/A	N/A	N/A	< 5
	9/26/2012	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	12/12/2012	< 5	N/A	< 1	< 5	N/A	N/A	N/A	< 5	N/A	N/A
	4/24/2013	< 10	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	10/28/2013	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	< 5
	4/25/2014	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	10/20/2014	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	4/17/2015	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	10/12/2015	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	4/18/2016	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	< 5
	10/25/2016	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	4/26/2017	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	10/24/2017	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	4/18/2018	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5
	10/24/2018	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A
	4/17/2019	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/23/2019	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5
	4/29/2020	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5
	10/19/2020	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5
	4/14/2021	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10
	4/14/2021	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A
	9/8/2021	< 10	< 10	< 10	2.36*	< 10	< 10	< 10	< 10	N/A	< 10
	9/8/2021	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	6/24/2022	< 10	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10
	9/20/2022	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	
2/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	< 10	< 10	N/A	< 10	N/A	< 10	< 10	N/A	< 10	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	
5/14/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	
11/18/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10	
11/18/2024	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
4-Methyl-2-Pentanone, ug/L (CAS NO - 108-10-1)	4/8/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	6/24/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	9/17/2008	< 10	N/A	< 10	N/A	N/A	N/A	N/A	N/A	< 10	< 10
	10/27/2008	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A	N/A	< 10
	12/11/2008	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	N/A	< 10
	5/7/2009	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	10/23/2009	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	4/22/2010	< 10	< 10	< 10	N/A	< 10	N/A	N/A	< 10	< 10	< 10
	8/30/2010	< 10	< 10	< 10	< 10	< 10	N/A	N/A	< 10	< 10	< 10
	10/26/2010	N/A	< 10	< 10	< 10	< 10	N/A	N/A	< 10	N/A	N/A
	1/12/2011	N/A	N/A	< 10	N/A	< 10	N/A	N/A	N/A	N/A	< 10

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
4-Methyl-2-Pentanone, ug/L (CAS NO - 108-10-1)	3/28/2011	<10	<10	<10	<10	<10	<10	N/A	<10	<10	<10	
	7/19/2011	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10	
	10/25/2011	<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	
	12/15/2011	N/A	<10	<10	<10	<10	<10	<10	N/A	N/A	<1	
	4/16/2012	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	7/6/2012	N/A	<5	<5	<5	<5	<5	<5	N/A	N/A	N/A	<5
	9/26/2012	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	12/12/2012	<5	N/A	<5	<5	<5	N/A	N/A	N/A	<5	N/A	N/A
	4/24/2013	<10	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	10/28/2013	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5
	4/25/2014	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	10/20/2014	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	4/17/2015	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	10/12/2015	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	4/18/2016	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5
	10/25/2016	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	4/26/2017	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	10/24/2017	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	4/18/2018	<5	<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
	10/24/2018	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
	4/17/2019	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
	10/23/2019	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	4/29/2020	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	10/19/2020	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	4/14/2021	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
	9/8/2021	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<10	<10	N/A	<10	<10	<10	<10	<10	N/A	<10
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A
	6/24/2022	<10	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
	9/20/2022	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
	2/8/2023	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<10	<10	N/A	N/A	<10	N/A	<10	<10	N/A	<10
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	<10	N/A	<10
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A
	11/18/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	<10	N/A	<10
	11/18/2024	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Acetone, ug/L (CAS NO - 67-64-1)	4/8/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	239	<10
		6/24/2008	<10	N/A	28.5	N/A	N/A	N/A	N/A	N/A	40.1	<10
		9/17/2008	<10	N/A	10.3	N/A	N/A	N/A	N/A	N/A	35.1	<10
10/27/2008		<10	N/A	<10	N/A	<10	N/A	N/A	N/A	N/A	<10	
12/11/2008		<10	<10	<10	N/A	<10	N/A	N/A	<10	N/A	<10	
5/7/2009		<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
10/23/2009		<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
4/22/2010		<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
8/30/2010		<10	<10	<10	<10	<10	N/A	N/A	<10	<10	<10	
10/26/2010		N/A	<10	<10	<10	<10	N/A	N/A	<10	N/A	N/A	
1/12/2011		N/A	N/A	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10
3/28/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	<10	<10
7/19/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
10/25/2011		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
12/15/2011		N/A	<10	<10	<10	<10	<10	<10	N/A	N/A	N/A	<10
4/16/2012		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
7/6/2012		N/A	<10	<10	<10	<10	<10	<10	N/A	N/A	N/A	<10
9/26/2012		<10	<10	11.6	<10	<10	<10	<10	N/A	<10	N/A	<10
12/12/2012		<10	N/A	<10	<10	<10	N/A	N/A	N/A	<10	N/A	N/A
4/24/2013		<20	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
10/28/2013		<10	<10	<10	<10	<10	N/A	<10	N/A	<10	N/A	<10
4/25/2014		<10	<10	26.1	<10	<10	<10	<10	N/A	<10	N/A	<10
10/20/2014		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
4/17/2015		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
10/12/2015		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
4/18/2016		<10	<10	<10	<10	<10	N/A	<10	N/A	<10	N/A	<10
10/25/2016		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
4/26/2017		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
10/24/2017		<10	<10	<10	<10	<10	<10	<10	N/A	16	N/A	<10
4/18/2018		<10	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10
10/24/2018		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A
4/17/2019		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A
10/23/2019		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
4/29/2020		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10
10/19/2020		<10	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10



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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
<b>Appendix I VOC Constituents</b> Acetone, ug/L (CAS NO - 67-64-1)	4/14/2021	<10	<10	<10	<10	<10	<10	<10	<10	N/A	3.11*	
	4/14/2021	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<10	<10	<10	4.39*	3.15*	<10	<10	<10	N/A	<10	
	9/8/2021	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	
	6/24/2022	<10	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<10	<10	<10	4.66*	<10	<10	<10	<10	N/A	<10	
	9/20/2022	3.15*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	7.01*	<10	<10	11	<10	<10	<10	<10	N/A	<10	
	2/8/2023	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<10	<10	N/A	<10	N/A	<10	<10	N/A	<10	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	3.47*	N/A	N/A	N/A	
	5/14/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	3.28*	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	
	11/18/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
	11/18/2024	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	<b>Acrylonitrile, ug/L (CAS NO - 107-13-1)</b>	4/8/2008	<20	N/A	<20	N/A	N/A	N/A	N/A	N/A	<20	<20
		6/24/2008	<20	N/A	<20	N/A	N/A	N/A	N/A	N/A	<20	<20
9/17/2008		<20	N/A	<20	N/A	N/A	N/A	N/A	N/A	<20	<20	
10/27/2008		<20	N/A	<20	N/A	<20	N/A	N/A	N/A	N/A	<20	
12/11/2008		<20	<20	<20	N/A	<20	N/A	N/A	<20	N/A	<20	
5/7/2009		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
10/23/2009		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
4/22/2010		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
8/30/2010		<20	<20	<20	<20	<10	N/A	N/A	<20	<20	<20	
10/26/2010		N/A	<20	<20	<20	<20	N/A	N/A	<20	N/A	N/A	
1/12/2011		N/A	N/A	<20	N/A	<20	N/A	N/A	N/A	N/A	<20	
3/28/2011		<20	<20	<20	<20	<20	<20	N/A	<20	<20	<20	
7/19/2011		<20	<20	<20	<20	<20	<20	N/A	<20	N/A	<20	
10/25/2011		<20	<20	<20	<20	<20	<20	N/A	<20	N/A	<20	
12/15/2011		N/A	<20	<20	<20	<20	<20	N/A	N/A	N/A	<20	
4/16/2012		<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	N/A	<2.2	N/A	<2.2	
7/6/2012		N/A	<2.2	<2.2	<2.2	<2.2	<2.2	N/A	N/A	N/A	<2.2	
9/26/2012		<0.8	<5	<5	<5	<5	<0.8	N/A	<0.8	N/A	<5	
12/12/2012		<0.8	N/A	<5	<0.8	N/A	N/A	N/A	<0.8	N/A	N/A	
4/24/2013		<10	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/28/2013		<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5	
4/25/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/20/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/17/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/12/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2016		<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5	
10/25/2016		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/26/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2018		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2018		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
4/17/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
10/23/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/29/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
10/19/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
9/8/2021	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
5/19/2022	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5		
5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A		
6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A		
9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5		
9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5		
2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	N/A	<5		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A		
11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5		
11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
<b>Benzene, ug/L (CAS NO - 71-43-2)</b>	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	4.8	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	5.8	1.6	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	6.2	4.9	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	1.6	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	7.9	1.6	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	6.4	3.3	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	7.1	1.3	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	8.4	4.7	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Benzene, ug/L (CAS NO - 71-43-2)	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	6.6	3	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	2.8	
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	6.9	4.3	
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	3.6	
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.6	
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	2.4	
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	6.4	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	2.7	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.4	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.7
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	2	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	4.9	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	5.6	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	7.9	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.3	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.3	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.4	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.8	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	4	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	3	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	2.6	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1.2	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	1.53	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<0.5	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	1.46	
	9/8/2021	N/A	N/A	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<0.5	<0.5	N/A	<0.5	<0.5	<0.5	<0.5	N/A	1.21	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<0.5	N/A	N/A	N/A
	6/24/2022	<0.5	N/A	N/A	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	1.34	
	9/20/2022	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	1.53	
	2/8/2023	N/A	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<0.5	<0.5	N/A	<0.5	N/A	<0.5	<0.5	N/A	1.37	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<0.5	N/A	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<0.5	N/A	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<0.5	<0.5	N/A	0.254*	<0.5	<0.5	<0.5	N/A	2.44	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<0.5	N/A	N/A	N/A	N/A
	11/18/2024	N/A	<0.5	<0.5	N/A	<0.5	<0.5	<0.5	<0.5	N/A	2	
11/18/2024	N/A	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Bromochloromethane, ug/L (CAS NO - 74-97-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	<1	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Bromochloromethane, ug/L (CAS NO - 74-97-5)	4/14/2021	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	4/14/2021	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	9/8/2021	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	
	6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	<5	<5	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Bromodichloromethane, ug/L (CAS NO - 75-27-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
9/17/2008		<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
10/27/2008		<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
12/11/2008		<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A		
6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A		
9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1		
9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1		
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Bromoform, ug/L (CAS NO - 75-25-2)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Bromoform, ug/L (CAS NO - 75-25-2)	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	7/6/2012	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/14/2021	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	9/8/2021	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<5	<5	N/A	N/A	<5	<5	<5	<5	N/A	<5
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A
	6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5
	2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	<5	N/A	<5
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	<5	N/A	<5
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A
	11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	<5	N/A	<5
	11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Bromomethane, ug/L (CAS NO - 74-83-9)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
6/24/2008		<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
9/17/2008		<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
10/27/2008		<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
12/11/2008		<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	<1	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Bromomethane, ug/L (CAS NO - 74-83-9)	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/14/2021	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
	4/14/2021	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
	9/8/2021	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A
	6/24/2022	<4	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
	9/20/2022	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
	2/8/2023	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<4	<4	N/A	<4	N/A	<4	<4	N/A	<4
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A
	11/18/2024	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4
	11/18/2024	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Carbon Disulfide, ug/L (CAS NO - 75-15-0)	4/8/2008	<5	N/A	<5	N/A	N/A	N/A	N/A	N/A	<5
6/24/2008		<5	N/A	<5	N/A	N/A	N/A	N/A	N/A	<5	<5
9/17/2008		<5	N/A	<5	N/A	N/A	N/A	N/A	N/A	<5	<5
10/27/2008		<5	N/A	<5	N/A	<5	N/A	N/A	N/A	N/A	<5
12/11/2008		<5	<5	<5	N/A	<5	N/A	N/A	<5	N/A	<5
5/7/2009		<5	<5	<5	N/A	<5	N/A	N/A	<5	<5	<5
10/23/2009		<5	<5	<5	N/A	<5	N/A	N/A	<5	<5	<5
4/22/2010		<5	<5	<5	N/A	<5	N/A	N/A	<5	<5	<5
8/30/2010		<5	<5	<5	<5	<5	N/A	N/A	<5	<1	<5
10/26/2010		N/A	<5	<5	<5	<5	N/A	N/A	<5	N/A	N/A
1/12/2011		N/A	N/A	<5	N/A	<5	N/A	N/A	N/A	N/A	<5
3/28/2011		<5	<5	<5	<5	<5	<5	N/A	<5	<5	<5
7/19/2011		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
10/25/2011		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5
12/15/2011		N/A	<5	<5	<5	<5	<5	N/A	N/A	N/A	<5
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	1.1	N/A	<1
4/25/2014		1.3	<1	<1	<1	<1	<1	N/A	1.8	N/A	<1
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	3	N/A	<1
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/19/2022		N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
9/20/2022		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
9/20/2022		<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2/8/2023		<1	<1	<1	0.958*	<1	<1	<1	<1	N/A	<1
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	4/8/2008	<1	<5	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/12/2012	<1	N/A	<1	<1	<1	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/14/2021	<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2
	4/14/2021	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2
	9/8/2021	N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A
	6/24/2022	<2	N/A	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2
	9/20/2022	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2
	2/8/2023	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<2	<2	N/A	<2	N/A	<2	<2	N/A	<2
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A
11/18/2024	N/A	<2	<2	N/A	<2	<2	<2	<2	N/A	<2	
11/18/2024	N/A	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Chlorobenzene, ug/L (CAS NO - 108-90-7)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	30.7	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	37.6	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	29.2	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	28.2	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	25.7	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	21.4	<1
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	42.9	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	25.6	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	19.6	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Chlorobenzene, ug/L (CAS NO - 108-90-7)	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.596*
	4/14/2021	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.493*
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	0.471*
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorodibromomethane, ug/L (CAS NO - 124-48-1)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	9/26/2012	N/A	<1	<1	<1	<1	N/A	N/A	N/A	N/A	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	4/25/2014	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/24/2017	N/A	N/A	N/A	N/A	<1	<1	N/A	N/A	N/A	<1
	4/14/2021	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	4/14/2021	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	9/8/2021	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<5	<5	N/A	<5	<5	<5	<5	<5	<5
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A
	6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A
9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	N/A	<5	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Chloroethane, ug/L (CAS NO - 75-00-3)	4/8/2008	<1	N/A	2.4	N/A	N/A	N/A	N/A	N/A	<1	2.8
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	2.6	N/A	N/A	N/A	N/A	N/A	3.2	5.6
	10/27/2008	<1	N/A	1.9	N/A	4.2	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	1.9	N/A	1.8	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	1.1	N/A	8.4	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	5.8	N/A	N/A	<1	1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	1.4
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	1.4
	3/28/2011	<1	<1	<1	<1	1	<1	N/A	<1	2.3	1.4
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.7
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.4
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	2
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.4
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	1.3
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Chloroethane, ug/L (CAS NO - 75-00-3)	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1.4	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4	
	4/14/2021	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4	
	9/8/2021	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	
	6/24/2022	<4	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4	
	9/20/2022	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4	
	2/8/2023	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<4	<4	N/A	N/A	<4	N/A	<4	<4	<4	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	
	11/18/2024	N/A	<4	<4	N/A	<4	<4	<4	<4	N/A	<4	
	11/18/2024	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Chloroform, ug/L (CAS NO - 67-66-3)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
		5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	1	1.2	<1
		10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
		10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A
		1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1
		7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
4/14/2021		N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
9/8/2021		N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	
6/24/2022		<3	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
9/20/2022		<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
2/8/2023	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		



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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Chloroform, ug/L (CAS NO - 67-66-3)	8/23/2023	N/A	<3	<3	N/A	<3	N/A	<3	<3	N/A	<3
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A
	5/14/2024	N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A
	11/18/2024	N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3
Chloromethane, ug/L (CAS NO - 74-87-3)	11/18/2024	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
	4/14/2021	<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3
	4/14/2021	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A
	9/8/2021	<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3
	9/8/2021	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A
	6/24/2022	<3	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3
	9/20/2022	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2/8/2023	<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
2/8/2023	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023	N/A	<3	<3	N/A	<3	N/A	<3	<3	N/A	<3	
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	N/A	
5/14/2024	N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3	
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	
11/18/2024	N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3	
11/18/2024	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	2.7
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	6.1	1.4
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	4.5	6.7
	10/27/2008	<1	N/A	<1	N/A	2.9	N/A	N/A	N/A	N/A	2.2
	12/11/2008	<1	<1	<1	N/A	1.8	N/A	N/A	<1	N/A	<1
	5/7/2009	<1	<1	<1	N/A	2.3	N/A	N/A	<1	2.1	<1
	10/23/2009	<1	<1	<1	N/A	2	N/A	N/A	<1	2	3.7
	4/22/2010	<1	<1	<1	N/A	1.4	N/A	N/A	<1	2	1
	8/30/2010	<1	<1	<1	<1	1.1	N/A	N/A	<1	9.7	5.5
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	3.3	3.3
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	2.9
	3/28/2011	<1	<1	<1	<1	1.2	<1	N/A	<1	2.1	2.8
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	3.5
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	3.9
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	5.9
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	3.7
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	4.9
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.7
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A
	4/24/2013	<2	<1	<1	<1	<1	<1	<1	<1	N/A	2.2

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	2.1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.4	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/26/2017	<1	<1	<1	<1	<1	1.2	<1	N/A	<1	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	1.4	
	4/18/2018	<1	<1	<1	<1	<1	2.4	<1	N/A	<1	1.8	
	10/24/2018	<1	<1	<1	<1	<1	4.2	<1	<1	<1	3.1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	1.8	<1	<1	<1	1.7	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.2	
	4/14/2021	<1	<1	<1	<1	<1	2.19	<1	<1	<1	1.14	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	2.08	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	1.19	<1	<1	<1	1.25	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	N/A	0.374*	<1	<1	<1	0.874*	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	0.492*	<1	<1	<1	0.798*	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	1.07	<1	<1	<1	0.802*	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	<1	N/A	<1	<1	0.599*	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	N/A	2.49	<1	<1	<1	0.632*	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	N/A	1.29	<1	<1	<1	0.835*	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	cis-1,3-Dichloropropene, ug/L (CAS NO - 10061-01-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
		5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
		10/26/2010	N/A	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A
		1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	<1	N/A	N/A	N/A	<1	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/28/2013		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2016		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/14/2021		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
4/14/2021		N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
9/8/2021		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
9/8/2021		N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<5	<5	N/A	N/A	<5	<5	<5	<5	<5	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	<5	N/A	
6/24/2022		<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
9/20/2022		<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
cis-1,3-Dichloropropene, ug/L (CAS NO - 10061-01-5)	2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	N/A	<5	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Ethylbenzene, ug/L (CAS NO - 100-41-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	4.1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	5.8	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	8.5	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	6.4	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	7.8	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	10	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	6.2	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	N/A	<1	8.2	1.2	
7/19/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.4	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/20/2022		<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/8/2023		N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023		N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
8/23/2023		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Iodomethane, ug/L (CAS NO - 74-88-4)	4/8/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10	<10	
	9/17/2008	<10	N/A	<10	N/A	N/A	N/A	N/A	N/A	<10	<10	
	10/27/2008	<10	N/A	<10	N/A	<10	N/A	N/A	N/A	N/A	<10	
	12/11/2008	<10	<10	<10	N/A	<10	N/A	N/A	<10	N/A	<10	
	5/7/2009	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
	10/23/2009	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
	4/22/2010	<10	<10	<10	N/A	<10	N/A	N/A	<10	<10	<10	
	8/30/2010	<10	<10	<10	<10	<10	N/A	N/A	<10	<10	<10	
	10/26/2010	N/A	<10	<10	<10	<10	N/A	N/A	<10	N/A	N/A	
	1/12/2011	N/A	N/A	<10	N/A	<10	N/A	N/A	N/A	N/A	<10	
	3/28/2011	<10	<10	<10	<10	<10	<10	N/A	<10	<10	<10	
	7/19/2011	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10	
	10/25/2011	<10	<10	<10	<10	<10	<10	N/A	<10	N/A	<10	
	12/15/2011	N/A	<10	<10	<10	<10	<10	N/A	N/A	N/A	<10	
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	<1	N/A	N/A	<1	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Iodomethane, ug/L (CAS NO - 74-88-4)	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
	4/14/2021	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	
	9/8/2021	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
	9/8/2021	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	
	6/24/2022	<10	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
	9/20/2022	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
	2/8/2023	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<10	<10	N/A	<10	N/A	<10	<10	N/A	<10	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	
	11/18/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
	11/18/2024	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Methylene Bromide, ug/L (CAS NO - 74-95-3)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1		
5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A		
6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A		
9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1		
9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Appendix I VOC Constituents Methylene Bromide, ug/L (CAS NO - 74-95-3)	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Methylene Chloride, ug/L (CAS NO - 75-09-2)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	1.5
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
7/6/2012		N/A	<5	<5	<5	<5	<5	N/A	N/A	N/A	<5	
9/26/2012		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
12/12/2012		<5	N/A	<5	<5	N/A	N/A	N/A	<5	N/A	N/A	
4/24/2013		<10	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/28/2013		<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5	
4/25/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/20/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/17/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/12/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2016		<5	<5	<5	<5	N/A	<5	N/A	<5	N/A	<5	
10/25/2016		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/26/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2018		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2018		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
4/17/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
10/23/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/29/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
10/19/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
9/8/2021		N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	
6/24/2022		<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
9/20/2022		<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
2/8/2023		N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023		N/A	<5	<5	N/A	<5	N/A	<5	<5	N/A	<5	
8/23/2023		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A		
11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5		
11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Styrene, ug/L (CAS NO - 100-42-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	<1	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	4/16/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Styrene, ug/L (CAS NO - 100-42-5)	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/28/2013	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/18/2016	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	<1	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	<1	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	<1	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Tetrachloroethene, ug/L (CAS NO - 127-18-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	5.3	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
		5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
		8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1
		10/26/2010	N/A	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A
		1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
		7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/28/2013		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	<1	N/A	<1	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
4/14/2021		N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<1	<1	N/A	<1	<1	<1	<1	<1	<1	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Tetrachloroethene, ug/L (CAS NO - 127-18-4)	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	N/A	<1	N/A	<1	<1	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Toluene, ug/L (CAS NO - 108-88-3)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	1.2	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	2.5	<1
10/27/2008		<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
12/11/2008		<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
5/7/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	2.2	<1	
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	7	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	4.4	<1	
8/30/2010		<1	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	1.4	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	15.4	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
12/12/2012		<1	N/A	<1	<1	<1	N/A	N/A	N/A	<1	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/28/2013		<2	<1	<1	<1	<1	N/A	<1	N/A	352	N/A	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	1.7	N/A	
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
4/18/2016		<1	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
4/14/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
4/14/2021		N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
9/8/2021		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	
9/8/2021		N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
6/24/2022		<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A		
9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A		
2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	<1	<1	N/A	N/A	<1	N/A	<1	<1	N/A		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
5/14/2024	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A		
11/18/2024	N/A	<1	<1	N/A	N/A	<1	<1	<1	<1	N/A		
11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	<1	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/15/2011	N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1		
4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1		

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	4/8/2008	<1	N/A	<1	<1	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
		5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	N/A	<1	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/20/2014		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/17/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/12/2015		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
10/25/2016		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/26/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2017		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
4/18/2018		<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
4/14/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
9/8/2021		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
9/8/2021		N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	



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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	6/24/2022	<5	N/A	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	9/20/2022	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
	2/8/2023	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<5	<5	N/A	<5	N/A	<5	<5	N/A	<5	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
	11/18/2024	N/A	<5	<5	N/A	<5	<5	<5	<5	N/A	<5	
	11/18/2024	N/A	<5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	trans-1,4-Dichloro-2-Butene, ug/L (CAS NO - 110-57-6)	4/8/2008	<20	N/A	<20	N/A	N/A	N/A	N/A	N/A	<20	<20
		9/17/2008	<20	N/A	<20	N/A	N/A	N/A	N/A	N/A	<20	<20
10/27/2008		<20	N/A	<20	N/A	<20	N/A	N/A	N/A	N/A	<20	
12/11/2008		<20	<20	<20	N/A	<20	N/A	N/A	<20	N/A	<20	
5/7/2009		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
10/23/2009		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
4/22/2010		<20	<20	<20	N/A	<20	N/A	N/A	<20	<20	<20	
8/30/2010		<20	<20	<20	<20	<20	N/A	N/A	<20	<20	<20	
10/26/2010		N/A	<20	<20	<20	<20	N/A	N/A	<20	N/A	N/A	
1/12/2011		N/A	N/A	<20	N/A	<20	N/A	N/A	N/A	N/A	<20	
3/28/2011		<20	<20	<20	<20	<20	<20	N/A	<20	<20	<20	
7/19/2011		<20	<20	<20	<20	<20	<20	N/A	<20	N/A	<20	
10/25/2011		<20	<20	<20	<20	<20	<20	N/A	<20	N/A	<20	
12/15/2011		N/A	<20	<20	<20	<20	<20	N/A	N/A	N/A	<20	
4/16/2012		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
7/6/2012		N/A	<5	<5	<5	<5	<5	N/A	N/A	N/A	<5	
9/26/2012		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
12/12/2012		<5	N/A	<5	<5	N/A	N/A	N/A	<5	N/A	N/A	
4/24/2013		<10	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/28/2013		<10	<5	<5	<10	N/A	<5	N/A	<10	N/A	<5	
4/25/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/20/2014		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/17/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/12/2015		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2016		<5	<5	<5	<5	<5	N/A	<5	N/A	<5	<5	
10/25/2016		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/26/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2017		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
4/18/2018		<5	<5	<5	<5	<5	<5	N/A	<5	N/A	<5	
10/24/2018		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
4/17/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<5	N/A	N/A	N/A	
10/23/2019		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/29/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
10/19/2020		<5	<5	<5	<5	<5	<5	<5	<5	N/A	<5	
4/14/2021		<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
4/14/2021		N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
9/8/2021		N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	
6/24/2022		<10	N/A	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
9/20/2022		<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		<10	<10	<10	<10	<10	<10	<10	<10	N/A	<10	
2/8/2023	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
8/23/2023	N/A	<10	<10	N/A	<10	N/A	<10	<10	N/A	<10		
8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A		
9/14/2023	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A	N/A		
5/14/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<10	N/A	N/A	N/A		
11/18/2024	N/A	<10	<10	N/A	<10	<10	<10	<10	N/A	<10		
11/18/2024	N/A	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Trichloroethene, ug/L (CAS NO - 79-01-6)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1	
	6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	3.5	<1	
	9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	2.5	<1	
	10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1	
	5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	3.4	<1	
	10/23/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	1.2	<1	
	4/22/2010	<1	<1	<1	N/A	<1	N/A	N/A	<1	2.3	<1	
	8/30/2010	<1	<1	<1	<1	<1	N/A	N/A	<1	N/A	<1	
	10/26/2010	N/A	<1	<1	<1	<1	N/A	N/A	<1	2.8	N/A	
	1/12/2011	N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
	3/28/2011	<1	<1	<1	<1	<1	<1	N/A	<1	2.1	<1	
	7/19/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/25/2011	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/15/2011	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	4/16/2012	<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Trichloroethene, ug/L (CAS NO - 79-01-6)	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	<1	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	N/A	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	4/8/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		6/24/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		9/17/2008	<1	N/A	<1	N/A	N/A	N/A	N/A	N/A	<1	<1
		10/27/2008	<1	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1
		12/11/2008	<1	<1	<1	N/A	<1	N/A	N/A	<1	N/A	<1
		5/7/2009	<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1
10/23/2009		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
4/22/2010		<1	<1	<1	N/A	<1	N/A	N/A	<1	<1	<1	
8/30/2010		<1	<1	<1	<1	<1	<1	N/A	N/A	<1	<1	
10/26/2010		N/A	<1	<1	<1	<1	N/A	N/A	<1	N/A	N/A	
1/12/2011		N/A	N/A	<1	N/A	<1	N/A	N/A	N/A	N/A	<1	
3/28/2011		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
7/19/2011		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
10/25/2011		<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
12/15/2011		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
4/16/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
7/6/2012		N/A	<1	<1	<1	<1	<1	<1	N/A	N/A	<1	
9/26/2012		<1	<1	<1	<1	<1	<1	<1	N/A	<1	<1	
12/12/2012		<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
4/24/2013		<2	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/28/2013		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
4/25/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/20/2014		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/17/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/12/2015		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2016		<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	<1
10/25/2016		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/26/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2017		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
4/18/2018		<1	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1
10/24/2018		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A
4/17/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A
10/23/2019		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/29/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
10/19/2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1
4/14/2021		<4	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
4/14/2021		N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A
9/8/2021		<4	<4	<4	<4	<4	<4	<4	<4	<4	N/A	<4
9/8/2021		N/A	N/A	<4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/19/2022		N/A	<4	<4	N/A	<4	<4	<4	<4	<4	N/A	<4
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<4	N/A	N/A

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	6/24/2022	< 4	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A	< 4	
	9/20/2022	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A	< 4	
	2/8/2023	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	< 4	< 4	N/A	< 4	N/A	< 4	< 4	N/A	< 4	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	
	5/14/2024	N/A	< 4	< 4	N/A	< 4	< 4	< 4	< 4	N/A	< 4	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	
	11/18/2024	N/A	< 4	< 4	N/A	< 4	< 4	< 4	< 4	N/A	< 4	
	11/18/2024	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Vinyl Acetate, ug/L (CAS NO - 108-05-4)	4/8/2008	< 20	N/A	< 20	N/A	N/A	N/A	N/A	N/A	< 20	< 20
		9/17/2008	< 20	N/A	< 20	N/A	N/A	N/A	N/A	N/A	< 20	< 20
10/27/2008		< 20	N/A	< 20	N/A	< 20	N/A	N/A	N/A	N/A	< 20	
12/11/2008		< 20	< 20	< 20	N/A	< 20	N/A	N/A	< 20	N/A	< 20	
5/7/2009		< 20	< 20	< 20	N/A	< 20	N/A	N/A	< 20	< 20	< 20	
10/23/2009		< 20	< 20	< 20	N/A	< 20	N/A	N/A	< 20	< 20	< 20	
4/22/2010		< 20	< 20	< 20	N/A	< 20	N/A	N/A	< 20	< 20	< 20	
8/30/2010		< 20	< 20	< 20	< 20	< 20	N/A	N/A	< 20	< 20	< 20	
10/26/2010		N/A	< 20	< 20	< 20	< 20	N/A	N/A	< 20	N/A	N/A	
1/12/2011		N/A	N/A	< 20	N/A	< 20	N/A	N/A	N/A	N/A	< 20	
3/28/2011		< 20	< 20	< 20	< 20	< 20	< 20	N/A	< 20	< 20	< 20	
7/19/2011		< 20	< 20	< 20	< 20	< 20	< 20	N/A	< 20	N/A	< 20	
10/25/2011		< 20	< 20	< 20	< 20	< 20	< 20	N/A	< 20	N/A	< 20	
12/15/2011		N/A	< 20	< 20	< 20	< 20	< 20	N/A	N/A	N/A	< 20	
4/16/2012		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
7/6/2012		N/A	< 5	< 5	< 5	< 5	< 5	N/A	N/A	N/A	< 5	
9/26/2012		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
12/12/2012		< 5	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	
4/24/2013		< 10	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
10/28/2013		< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	< 5	
4/25/2014		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
10/20/2014		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
4/17/2015		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
10/12/2015		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
4/18/2016		< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	< 5	
10/25/2016		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
4/26/2017		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
10/24/2017		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
4/18/2018		< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	N/A	< 5	
10/24/2018		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	
4/17/2019		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	
10/23/2019		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	
4/29/2020		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	
10/19/2020		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A	< 5	
4/14/2021		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	
4/14/2021		N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	
9/8/2021		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	
9/8/2021		N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	
6/24/2022		< 10	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	
9/20/2022		< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A	< 10	
2/8/2023		N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023		N/A	< 10	< 10	N/A	< 10	N/A	< 10	< 10	N/A	< 10	
8/23/2023		N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	
9/14/2023		N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	
5/14/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10		
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A		
11/18/2024	N/A	< 10	< 10	N/A	< 10	< 10	< 10	< 10	N/A	< 10		
11/18/2024	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	4/8/2008	< 1	N/A	< 1	N/A	N/A	N/A	N/A	N/A	< 1	< 1	
	6/24/2008	< 1	N/A	< 1	N/A	N/A	N/A	N/A	N/A	< 1	< 1	
	9/17/2008	< 1	N/A	< 1	N/A	N/A	N/A	N/A	N/A	1.5	< 1	
	10/27/2008	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A	N/A	< 1	
	12/11/2008	< 1	< 1	< 1	N/A	< 1	N/A	N/A	< 1	N/A	< 1	
	5/7/2009	< 1	< 1	< 1	N/A	< 1	N/A	N/A	< 1	5.3	< 1	
	10/23/2009	< 1	< 1	< 1	N/A	< 1	N/A	N/A	< 1	5.1	< 1	
	4/22/2010	< 1	< 1	< 1	N/A	< 1	N/A	N/A	< 1	5.4	< 1	
	8/30/2010	< 1	< 1	< 1	< 1	< 1	N/A	N/A	< 1	4.3	< 1	
	10/26/2010	N/A	< 1	< 1	< 1	< 1	N/A	N/A	< 1	4.2	N/A	
	1/12/2011	N/A	N/A	< 1	N/A	< 1	N/A	N/A	N/A	N/A	< 1	
	3/28/2011	< 1	< 1	< 1	< 1	< 1	< 1	N/A	< 1	3.9	1.4	
	7/19/2011	< 1	< 1	< 1	< 1	< 1	< 1	N/A	< 1	N/A	1.4	
	10/25/2011	< 1	< 1	< 1	< 1	< 1	< 1	N/A	< 1	N/A	< 1	
	12/15/2011	N/A	< 1	< 1	< 1	< 1	< 1	N/A	N/A	N/A	1.1	
	4/16/2012	< 1	< 1	< 1	< 1	< 1	< 1	N/A	< 1	N/A	2.2	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	7/6/2012	N/A	<1	<1	<1	<1	<1	N/A	N/A	N/A	1.4	
	9/26/2012	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	0.6	
	12/12/2012	<1	N/A	<1	<1	N/A	N/A	N/A	<1	N/A	N/A	
	4/24/2013	<2	<1	<1	<1	<1	<1	N/A	<1	N/A	1.2	
	10/28/2013	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	1	
	4/25/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.7	
	10/20/2014	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.4	
	4/17/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	2.5	
	10/12/2015	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/18/2016	<1	<1	<1	<1	N/A	<1	N/A	<1	N/A	<1	
	10/25/2016	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	4/26/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	<1	
	10/24/2017	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1	
	4/18/2018	<1	<1	<1	<1	<1	<1	N/A	<1	N/A	1.3	
	10/24/2018	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1.8	
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	4/17/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1	
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	10/23/2019	<1	<1	<1	<1	<1	<1	<1	<1	N/A	1.6	
	4/29/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	10/19/2020	<1	<1	<1	<1	<1	<1	<1	<1	N/A	<1	
	4/14/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.486*	
	4/14/2021	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	9/8/2021	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.75*	
	9/8/2021	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	0.533*	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	
	6/24/2022	<1	N/A	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.993*	
	9/20/2022	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	<1	<1	<1	<1	<1	<1	<1	<1	N/A	0.569*	
	2/8/2023	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	N/A	
	5/14/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	1.01	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	<1	N/A	N/A	N/A	
	11/18/2024	N/A	<1	<1	N/A	<1	<1	<1	<1	N/A	<1	
	11/18/2024	N/A	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Xylenes, total, ug/L (CAS NO - 1330-20-7)	4/8/2008	<3	N/A	<3	N/A	N/A	N/A	N/A	N/A	<3	<3
		6/24/2008	<3	N/A	<3	N/A	N/A	N/A	N/A	N/A	<3	<3
		9/17/2008	<3	N/A	<3	N/A	N/A	N/A	N/A	N/A	6.5	<3
		10/27/2008	<3	N/A	<3	N/A	<3	N/A	N/A	N/A	N/A	<3
		12/11/2008	<3	<3	<3	N/A	<3	N/A	N/A	<3	N/A	<3
		5/7/2009	<3	<3	<3	N/A	<3	N/A	N/A	<3	8.1	<3
10/23/2009		<3	<3	<3	N/A	<3	N/A	N/A	<3	5.9	<3	
4/22/2010		<3	<3	<3	N/A	<3	N/A	N/A	<3	6.8	<3	
8/30/2010		<3	<3	<3	<3	<3	N/A	N/A	<3	4.8	<3	
10/26/2010		N/A	<3	<3	<3	<3	N/A	N/A	<3	N/A	N/A	
1/12/2011		N/A	N/A	<3	N/A	<3	N/A	N/A	N/A	N/A	<3	
3/28/2011		<3	<3	<3	<3	<3	<3	N/A	<3	4.9	<3	
7/19/2011		<3	<3	<3	<3	<3	<3	N/A	<3	N/A	<3	
10/25/2011		<3	<3	<3	<3	<3	<3	N/A	<3	N/A	<3	
12/15/2011		N/A	<3	<3	<3	<3	<3	N/A	N/A	N/A	<3	
4/16/2012		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
7/6/2012		N/A	<2	<2	<2	<2	<2	N/A	N/A	N/A	<2	
9/26/2012		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
12/12/2012		<2	N/A	<2	<2	N/A	N/A	N/A	<2	N/A	N/A	
4/24/2013		<4	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
10/28/2013		<2	<2	<2	<2	N/A	<2	N/A	<2	N/A	<2	
4/25/2014		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
10/20/2014		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
4/17/2015		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
10/12/2015		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
4/18/2016		<2	<2	<2	<2	N/A	<2	N/A	<2	N/A	<2	
10/25/2016		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
4/26/2017		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
10/24/2017		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
4/18/2018		<2	<2	<2	<2	<2	<2	N/A	<2	N/A	<2	
10/24/2018		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
2/4/2019		N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	
4/17/2019		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	<2	N/A	N/A	N/A	
10/23/2019		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
4/29/2020		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
10/19/2020		<2	<2	<2	<2	<2	<2	<2	<2	N/A	<2	
4/14/2021		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
4/14/2021		N/A	N/A	N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	
9/8/2021		<3	<3	<3	<3	<3	<3	<3	<3	N/A	<3	
9/8/2021		N/A	N/A	<3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	<3	<3	N/A	<3	<3	<3	<3	N/A	<3	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	<3	N/A	N/A	

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Appendix I VOC Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Xylenes, total, ug/L (CAS NO - 1330-20-7)	6/24/2022	< 3	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A	< 3
	9/20/2022	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A	< 3
	2/8/2023	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	< 3	< 3	N/A	< 3	N/A	< 3	< 3	N/A	< 3
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/14/2024	N/A	< 3	< 3	N/A	< 3	< 3	< 3	< 3	N/A	< 3
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/18/2024	N/A	< 3	< 3	N/A	< 3	< 3	< 3	< 3	N/A	< 3
	11/18/2024	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	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.

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Other Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
1,1-Dichloropropene, ug/L (CAS NO - 563-58-6)	9/20/2022	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	< 1
1,2,4,5-Tetrachlorobenzene, ug/L (CAS NO - 95-94-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
1,2,4-Trichlorobenzene, ug/L (CAS NO - 120-82-1)	9/20/2022	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	< 5
1,3,5-Trinitrobenzene, ug/L (CAS NO - 99-35-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
1,3-Dichlorobenzene, ug/L (CAS NO - 541-73-1)	9/20/2022	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	< 1
1,3-Dichloropropane, ug/L (CAS NO - 142-28-9)	9/20/2022	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	< 1
1,3-Dinitrobenzene, ug/L (CAS NO - 99-65-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
1,4-Naphthoquinone, ug/L (CAS NO - 130-15-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
1,4-Phenylenediamine, ug/L (CAS NO - 106-50-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
1-Naphthylamine, ug/L (CAS NO - 134-32-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,2-Dichloropropane, ug/L (CAS NO - 594-20-7)	9/20/2022	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	< 4
2,3,4,6-Tetrachlorophenol, ug/L (CAS NO - 58-90-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,4,5-T [2C], ug/L (CAS NO - 93-76-5)	9/20/2022	N/A	N/A	N/A	N/A	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5
2,4,5-TP [Silvex] [2C], ug/L (CAS NO - 93-72-1)	9/20/2022	N/A	N/A	N/A	N/A	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5
2,4,5-Trichlorophenol, ug/L (CAS NO - 95-95-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,4,6-Trichlorophenol, ug/L (CAS NO - 88-06-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,4-D [2C], ug/L (CAS NO - 94-75-7)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 2
2,4-Dichlorophenol, ug/L (CAS NO - 120-83-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,4-Dimethylphenol, ug/L (CAS NO - 105-67-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,4-Dinitrophenol, ug/L (CAS NO - 51-28-5)	9/20/2022	N/A	N/A	N/A	N/A	< 20	< 20.4	N/A	N/A	N/A	< 20
2,4-Dinitrotoluene, ug/L (CAS NO - 121-14-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,6-Dichlorophenol, ug/L (CAS NO - 87-65-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2,6-Dinitrotoluene, ug/L (CAS NO - 606-20-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Acetylaminofluorene, ug/L (CAS NO - 53-96-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Chloronaphthalene, ug/L (CAS NO - 91-58-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Chlorophenol, ug/L (CAS NO - 95-57-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Methylnaphthalene, ug/L (CAS NO - 91-57-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Methylphenol, ug/L (CAS NO - 95-48-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Naphthylamine, ug/L (CAS NO - 91-59-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Nitroaniline, ug/L (CAS NO - 88-74-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
2-Nitrophenol, ug/L (CAS NO - 88-75-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
3,3-Dichlorobenzidine, ug/L (CAS NO - 91-94-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
3,3-Dimethylbenzidine, ug/L (CAS NO - 119-93-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
3/4-Methylphenol, ug/L (CAS NO - T-34MP)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
3-Chloropropene, ug/L (CAS NO - 107-05-1)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 2
3-Methylcholanthrene, ug/L (CAS NO - 56-49-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
3-Nitroaniline, ug/L (CAS NO - 99-09-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4,4'-DDD, ug/L (CAS NO - 72-54-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
4,4'-DDE, ug/L (CAS NO - 72-55-9)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
4,4'-DDT, ug/L (CAS NO - 50-29-3)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
4,6-Dinitro-2-methylphenol, ug/L (CAS NO - 534-52-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Aminobiphenyl, ug/L (CAS NO - 92-67-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Bromophenyl phenyl ether, ug/L (CAS NO - 101-55-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Chloro-3-methylphenol, ug/L (CAS NO - 59-50-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Chloroaniline, ug/L (CAS NO - 106-47-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Chlorophenyl phenyl ether, ug/L (CAS NO - 7005-72-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Nitroaniline, ug/L (CAS NO - 100-01-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
4-Nitrophenol, ug/L (CAS NO - 100-02-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
5-Nitro-o-toluidine, ug/L (CAS NO - 99-55-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
7,12-Dimethylbenz [a] anthracene, ug/L (CAS NO - 57-97-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Acenaphthene, ug/L (CAS NO - 83-32-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Acenaphthylene, ug/L (CAS NO - 208-96-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Acetonitrile, mg/L (CAS NO - 75-05-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	< 10
Acetophenone, ug/L (CAS NO - 98-86-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Acrolein, ug/L (CAS NO - 107-02-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	< 10
Aldrin, ug/L (CAS NO - 309-00-2)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Anthracene, ug/L (CAS NO - 120-12-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzo [a] anthracene, ug/L (CAS NO - 56-55-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzo [a] pyrene, ug/L (CAS NO - 50-32-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzo [b] fluoranthene, ug/L (CAS NO - 205-99-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzo [g,h,i] perylene, ug/L (CAS NO - 191-24-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzo [k] fluoranthene, ug/L (CAS NO - 207-08-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Benzyl alcohol, ug/L (CAS NO - 100-51-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Alpha-BHC, ug/L (CAS NO - 319-84-6)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Beta-BHC, ug/L (CAS NO - 319-85-7)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Delta-BHC, ug/L (CAS NO - 319-86-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Gamma-BHC [Lindane], ug/L (CAS NO - 58-89-9)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Bis[2-chloroethoxy]methane, ug/L (CAS NO - 111-91-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Bis[2-chloroethoxy]ether, ug/L (CAS NO - 111-44-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Bis[2-chloroisopropyl]ether, ug/L (CAS NO - 108-60-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Bis[2-ethylhexyl]phthalate, ug/L (CAS NO - 117-81-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Butyl benzyl phthalate, ug/L (CAS NO - 85-68-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Chlordane, ug/L (CAS NO - 57-74-9)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 1.85
Chlorobenzilate, ug/L (CAS NO - 510-15-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Chloroprene, ug/L (CAS NO - 126-99-8)	9/20/2022	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	< 1
Chrysene, ug/L (CAS NO - 218-01-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Cyanide, mg/L (CAS NO - 57-12-5)	9/20/2022	N/A	N/A	N/A	N/A	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01
Diallate [cis or trans], ug/L (CAS NO - 2303-16-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dibenz [a,h] anthracene, ug/L (CAS NO - 53-70-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dibenzofuran, ug/L (CAS NO - 132-64-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dichlorodifluoromethane, ug/L (CAS NO - 75-71-8)	9/20/2022	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	< 3
Dieldrin, ug/L (CAS NO - 60-57-1)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593

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## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Other Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
Diethyl phthalate, ug/L (CAS NO - 84-66-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dimethoate, ug/L (CAS NO - 60-51-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dimethyl phthalate, ug/L (CAS NO - 131-11-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Dimethylaminoazobenzene, ug/L (CAS NO - 60-11-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Di-n-butyl phthalate, ug/L (CAS NO - 84-74-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Di-n-octyl phthalate, ug/L (CAS NO - 117-84-0)	9/20/2022	N/A	N/A	N/A	N/A	< 20	< 20.4	N/A	N/A	N/A	< 20
Dinoseb, ug/L (CAS NO - 88-85-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Diphenylamine, ug/L (CAS NO - 122-39-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Disulfoton, ug/L (CAS NO - 298-04-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Endosulfan I, ug/L (CAS NO - 959-98-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Endosulfan II, ug/L (CAS NO - 33213-65-9)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Endosulfan sulfate, ug/L (CAS NO - 1031-07-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Endrin, ug/L (CAS NO - 72-20-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Endrin aldehyde, ug/L (CAS NO - 7421-93-4)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Ethyl Methacrylate, ug/L (CAS NO - 97-63-2)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 2
Ethyl Methanesulfonate, ug/L (CAS NO - 62-50-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Famphur, ug/L (CAS NO - 52-85-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Fluoranthene, ug/L (CAS NO - 206-44-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Fluorene, ug/L (CAS NO - 86-73-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Heptachlor, ug/L (CAS NO - 76-44-8)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Heptachlor Epoxide, ug/L (CAS NO - 1024-57-3)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Hexachlorobenzene, ug/L (CAS NO - 118-74-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Hexachlorobutadiene, ug/L (CAS NO - 87-68-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Hexachlorocyclopentadiene, ug/L (CAS NO - 77-47-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Hexachloroethane, ug/L (CAS NO - 67-72-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Hexachloropropene, ug/L (CAS NO - 1888-71-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Indeno [1,2,3-cd] pyrene, ug/L (CAS NO - 193-39-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Isobutanol, mg/L (CAS NO - 78-83-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	< 10
Isodrin, ug/L (CAS NO - 465-73-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Isophorone, ug/L (CAS NO - 78-59-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Isosafrole, ug/L (CAS NO - 120-58-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Kepone, ug/L (CAS NO - 143-50-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Methacrylonitrile, ug/L (CAS NO - 126-98-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	< 10
Methapyrilene, ug/L (CAS NO - 91-80-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Methoxychlor, ug/L (CAS NO - 72-43-5)	9/20/2022	N/A	N/A	N/A	N/A	< 0.064	< 0.064	N/A	N/A	N/A	< 0.0593
Methyl Methacrylate, ug/L (CAS NO - 80-62-6)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 2
Methyl Methanesulfonate, ug/L (CAS NO - 66-27-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Naphthalene, ug/L (CAS NO - 91-20-3)	9/20/2022	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	< 5
Nitrobenzene, ug/L (CAS NO - 98-95-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosodiethylamine, ug/L (CAS NO - 55-18-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosodimethylamine, ug/L (CAS NO - 62-75-9)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosodi-n-butylamine, ug/L (CAS NO - 924-16-3)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosodi-n-propylamine, ug/L (CAS NO - 621-64-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosodiphenylamine, ug/L (CAS NO - 86-30-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosomethylethylamine, ug/L (CAS NO - 10595-95-6)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosopiperidine, ug/L (CAS NO - 100-75-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
N-Nitrosopyrrolidine, ug/L (CAS NO - 930-55-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
O,O,O-Triethyl Phosphorothioate, ug/L (CAS NO - 126-68-1)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
O-Toluidine, ug/L (CAS NO - 95-53-4)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Parathion-Ethyl, ug/L (CAS NO - 56-38-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Parathion-Methyl, ug/L (CAS NO - 298-00-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
PCB-1016, ug/L (CAS NO - 12674-11-2)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1221, ug/L (CAS NO - 11104-28-2)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1232, ug/L (CAS NO - 11141-16-5)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1242, ug/L (CAS NO - 53469-21-9)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1248, ug/L (CAS NO - 12672-29-6)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1254, ug/L (CAS NO - 11097-69-1)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
PCB-1260, ug/L (CAS NO - 11096-82-5)	9/20/2022	N/A	N/A	N/A	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.741
Pentachlorobenzene, ug/L (CAS NO - 608-93-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Pentachloronitrobenzene, ug/L (CAS NO - 82-68-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Pentachlorophenol [2C], ug/L (CAS NO - 87-86-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Phenacetin, ug/L (CAS NO - 62-44-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Phenanthrene, ug/L (CAS NO - 85-01-8)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Phenol, ug/L (CAS NO - 108-95-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Phorate, ug/L (CAS NO - 298-02-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Pronamide, ug/L (CAS NO - 23950-58-5)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Propionitrile, ug/L (CAS NO - 107-12-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	< 10
Pyrene, ug/L (CAS NO - 129-00-0)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Safrole, ug/L (CAS NO - 94-59-7)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Sulfide, mg/L (CAS NO - 18496-25-8)	9/20/2022	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	< 1
Thionazin, ug/L (CAS NO - 297-97-2)	9/20/2022	N/A	N/A	N/A	N/A	< 10	< 10.2	N/A	N/A	N/A	< 10
Toxaphene, ug/L (CAS NO - 8001-35-2)	9/20/2022	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	< 1.85
Alkalinity, Total [CaCO3], mg/L (CAS NO - TALK)	4/18/2018	207	272	416	120	447	12	N/A	106	N/A	538
	10/24/2018	191	235	587	73	459	10	< 10	104	N/A	526
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/17/2019	203	254	502	< 10	482	23	< 10	512	N/A	869
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/23/2019	221	215	574	57	387	16	< 10	113	N/A	668
	4/29/2020	201	253	546	< 10	424	< 10	< 10	366	N/A	551
	10/19/2020	311	191	481	13	361	23	< 10	146	N/A	449
	4/14/2021	193	213	465	7.43	515	< 5	< 5	129	N/A	574
	4/14/2021	N/A	N/A	N/A	N/A	515	N/A	N/A	N/A	N/A	N/A

# SCS ENGINEERS

## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Other Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG	
Alkalinity, Total [CaCO3], mg/L (CAS NO - TALK)	9/8/2021	216	237	464	56.7	479	3.78*	< 5	67	N/A	649	
	9/8/2021	N/A	N/A	505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	216	367	N/A	395	56.4	< 5	65.8	N/A	489	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	47	N/A	N/A	
	6/24/2022	287	N/A	N/A	43.5	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	236	300	409	< 5	436	< 5	< 5	54.5	N/A	581	
	9/20/2022	227	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	212	265	401	53.9	479	54.2	< 5	56.7	N/A	596	
	2/8/2023	N/A	267	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	228	387	N/A	431	N/A	< 5	28	N/A	553	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	26.5	N/A	N/A	N/A	N/A	
	5/14/2024	277	281	531	N/A	596	39.8	< 5	55.6	N/A	705	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	
	11/18/2024	N/A	296	532	N/A	488	22.4	< 5	50.4	N/A	636	
	11/18/2024	N/A	294	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Aluminum, mg/L (CAS NO - 7429-90-5)	4/18/2018	0.18	0.219	0.111	0.17	0.293	2.42	N/A	0.23	N/A	0.1
		10/24/2018	3.88	0.055	0.066	0.733	0.222	1.89	15.3	0.063	N/A	0.645
		2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.4	N/A	N/A
		4/17/2019	1.1	1.04	0.745	15	0.374	1.33	13.9	0.069	N/A	0.164
7/31/2019		N/A	N/A	N/A	N/A	N/A	N/A	14.6	N/A	N/A	N/A	
10/23/2019		0.79	1.4	1.3	1.7	0.246	3.6	17.5	0.58	N/A	0.134	
4/29/2020		0.483	0.455	< 0.05	3.47	0.179	2.95	25.8	< 0.05	N/A	< 0.05	
10/19/2020		0.153	0.221	< 0.05	3.73	0.159	2.67	21.2	0.072	N/A	0.069	
4/14/2021		3.06	0.0409*	< 0.2	2.44	0.11	2.94	9.89	0.457	N/A	< 0.05	
4/14/2021		N/A	N/A	N/A	N/A	0.324	N/A	N/A	N/A	N/A	N/A	
9/8/2021		0.607	< 0.05	< 0.05	1.63	0.0584	0.949	11.9	< 0.05	N/A	< 0.2	
9/8/2021		N/A	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
5/19/2022		N/A	< 0.05	0.0191*	N/A	0.0191*	0.741	16.9	< 0.05	N/A	< 0.05	
5/19/2022		N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0327*	N/A	N/A	
6/24/2022		0.485	N/A	N/A	1.07	N/A	N/A	N/A	N/A	N/A	N/A	
9/20/2022		0.588	0.0217*	0.0212*	1.79	< 0.05	4.54	18.8	< 0.05	N/A	< 0.05	
9/20/2022		3.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
2/8/2023		0.54	< 0.05	0.0404*	1.55	0.0911	0.632	21.4	< 0.05	N/A	< 0.05	
2/8/2023		N/A	0.0394*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
8/23/2023		N/A	0.164	0.0232*	N/A	0.115	N/A	19.3	0.0541	N/A	0.0284*	
8/23/2023		N/A	N/A	N/A	N/A	N/A	N/A	19.1	N/A	N/A	N/A	
9/14/2023		N/A	N/A	N/A	N/A	N/A	2.97	N/A	N/A	N/A	N/A	
5/14/2024		0.507	< 0.05	< 0.05	N/A	0.057	4.38	41.5	< 0.05	N/A	< 0.05	
5/14/2024		N/A	N/A	N/A	N/A	N/A	N/A	35.1	N/A	N/A	N/A	
11/18/2024		N/A	0.0449*	< 0.05	N/A	1.38	4.74	24.5	0.737	N/A	< 0.05	
11/18/2024		N/A	0.176	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Iron, Total, mg/L (CAS NO - 7439-89-6)		4/18/2018	0.628	0.195	95.5	694	10.9	26.7	N/A	255	N/A	31
		10/24/2018	7.02	< 0.1	120	505	15.2	2.32	10.5	65.1	N/A	50.5
		2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	1.05	N/A	N/A	N/A
		4/17/2019	1.54	1.31	84.5	133	6.29	21.8	9.28	19.9	N/A	122
		7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	9.34	N/A	N/A	N/A
		10/23/2019	1.55	1.6	108	125	7.48	43.8	13.8	13	N/A	119
		4/29/2020	1.07	0.716	63.8	203	5.66	9.94	28.1	19.8	N/A	90.3
		10/19/2020	0.658	0.264	68.8	282	6.06	68.3	27.5	117	N/A	110
		4/14/2021	9.42	0.0503*	56.4	328	18.3	66.3	4.97	55.4	N/A	117
		4/14/2021	N/A	N/A	N/A	N/A	19.6	N/A	N/A	N/A	N/A	N/A
	9/8/2021	1.86	< 0.1	39.3	240	4.79	193	4.28	73.5	N/A	101	
	9/8/2021	N/A	N/A	49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	5/19/2022	N/A	0.153	35.5	N/A	1.59	318	9.92	151	N/A	93.7	
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	121	N/A	N/A	
	6/24/2022	3.37	N/A	N/A	453	N/A	N/A	N/A	N/A	N/A	N/A	
	9/20/2022	1.49	< 0.1	37.2	395	4.04	166	14.9	150	N/A	89.3	
	9/20/2022	6.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	2/8/2023	1.78	< 0.1	35.5	463	8.48	56.6	1.97	151	N/A	66.9	
	2/8/2023	N/A	< 0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	8/23/2023	N/A	0.222	33.6	N/A	5.46	N/A	6.45	101	N/A	33	
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	7.53	N/A	N/A	N/A	
	9/14/2023	N/A	N/A	N/A	N/A	N/A	106	N/A	N/A	N/A	N/A	
	5/14/2024	22.5	< 0.1	33.2	N/A	15.9	76.9	2.75	169	N/A	52.6	
	5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	3.98	N/A	N/A	N/A	
	11/18/2024	N/A	0.0566*	30.6	N/A	18.2	60.7	15.2	139	N/A	43.1	
	11/18/2024	N/A	0.205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	pH, S.U. (CAS NO - PH)	4/18/2018	6.6	6.6	6.2	5.5	6.8	4.9	N/A	6.2	N/A	6.3
		10/24/2018	6.6	6.8	6.3	5.3	7.5	5	4	6.2	N/A	6.3
		4/17/2019	7	6.9	6.5	4.4	6.9	5.4	4	6.9	N/A	6.6
		10/23/2019	6.8	6.8	6.4	5.4	6.9	5	4	7.4	N/A	6.4
		4/29/2020	6.9	6.8	6.5	4.7	6.9	4.9	3.8	7.1	N/A	6.5
		10/19/2020	6.7	6.7	6.3	4.7	6.9	5	3.6	6.4	N/A	6.3
		4/14/2021	6.48	6.43	6.06	4.53	6.21	4.85	3.4	7.21	N/A	6.05
		9/8/2021	6.53	6.42	6.07	4.67	6.56	5.01	3.43	6.8	N/A	6.05
		5/19/2022	N/A	6.33	6.11	N/A	6.85	4.94	3.29	6.83	N/A	6.14
		6/24/2022	6.39	N/A	N/A	4.53	N/A	N/A	N/A	N/A	N/A	N/A
9/20/2022		6.22	6.23	6.06	4.51	6.56	4.84	3.01	6.5	N/A	5.92	
2/8/2023		6.58	6.48	6.2	4.98	6.72	5.27	3.43	6.61	N/A	6.03	
8/23/2023		N/A	6.5	6.2	N/A	6.74	N/A	3.52	6.81	N/A	6.08	
9/14/2023		N/A	N/A	N/A	N/A	N/A	4.86	N/A	N/A	N/A	N/A	



# SCS ENGINEERS

## Summary of Groundwater Chemistry

Mahaska County Solid Waste Management Commission - 62-SDP-01-74P

Other Constituents	Sample Date	DW-15 UPG	DW-19 UPG	UW-11 UPG	UW-21 UPG	DW-8 DNG	DW-23 DNG	DW-24 DNG	PZ-14 DNG	UW-9R DNG	UW-10 DNG
pH, S.U. (CAS NO - PH)	5/14/2024	6.26	6.21	6.12	N/A	6.23	4.44	2.87	6.74	N/A	5.99
	11/18/2024	N/A	6.35	6.27	N/A	6.45	4.37	3.44	6.49	N/A	6.08
Sulfate, mg/L (CAS NO - 14808-79-8)	4/18/2018	255	530	2560	5140	396	3210	N/A	1440	N/A	1390
	10/24/2018	68.8	446	2620	5220	517	3020	698	1450	N/A	1540
	2/4/2019	N/A	N/A	N/A	N/A	N/A	N/A	747	N/A	N/A	N/A
	4/17/2019	50.1	479	2500	4170	480	2890	659	460	N/A	1500
	7/31/2019	N/A	N/A	N/A	N/A	N/A	N/A	702	N/A	N/A	N/A
	10/23/2019	43.8	443	2510	3050	234	3530	860	761	N/A	1910
	4/29/2020	42.9	458	2330	3650	341	3130	1230	908	N/A	1270
	10/19/2020	43.8	422	2320	4170	166	4280	1120	1100	N/A	1880
	4/14/2021	43.4	378	2190	3580	611	3940	628	1110	N/A	1540
	4/14/2021	N/A	N/A	N/A	N/A	563	N/A	N/A	N/A	N/A	N/A
	9/8/2021	45.6	448	2450	3680	311	4390	710	1240	N/A	1640
	9/8/2021	N/A	N/A	2310	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/19/2022	N/A	447	2740	N/A	221	5860	1120	1470	N/A	1160
	5/19/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1700	N/A	N/A
	6/24/2022	55.1	N/A	N/A	3990	N/A	N/A	N/A	N/A	N/A	N/A
	9/20/2022	46.7	420	2390	4000	180	5370	906	1320	N/A	1330
	9/20/2022	50.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/8/2023	48.3	439	2360	4460	243	2750	923	1480	N/A	1110
	2/8/2023	N/A	447	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2023	N/A	695	313	N/A	320	N/A	1310	1780	N/A	1420
	8/23/2023	N/A	N/A	N/A	N/A	N/A	N/A	1210	N/A	N/A	N/A
	9/14/2023	N/A	N/A	N/A	N/A	N/A	4550	N/A	N/A	N/A	N/A
	5/14/2024	34.1	557	2150	N/A	594	4130	1080	1550	N/A	1020
5/14/2024	N/A	N/A	N/A	N/A	N/A	N/A	1100	N/A	N/A	N/A	
11/18/2024	N/A	617	1970	N/A	378	3880	1020	942	N/A	934	
11/18/2024	N/A	579	N/A	N/A	N/A	N/A	N/A	N/A	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 Method and Output**

## Statistical Method and Output

The purpose of this document is to describe the statistical method used in the evaluation of groundwater analytical data collected from the groundwater monitoring network of the Binns & Stevens municipal solid waste landfill unit (Binns & Stevens MSWLF unit) at the Mahaska County Sanitary Landfill.

### **Diagnostic and Exploratory Evaluations and Tests of Assumptions**

The detection and assessment monitoring statistical programs include diagnostic and exploratory evaluations and statistical tests of assumptions, as appropriate, including the following:

- Time Series Plots
- Shapiro-Wilk test for normality
- Ohio Environmental Protection Agency (EPA) Method for outliers
- Mann-Kendall/Sen's Slope trend test

### **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 ( $\frac{1}{2}$ ) 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 Sanitas™ statistical software program and described below, which includes the use of Dixon's, Rosner's, and Tukey's outlier tests, as appropriate based on the diagnostic tests, for the datasets that contain less than 75% of the measured concentrations below the PQL. Outliers are not confirmed unless a physical cause or explanation for the outlier is determined.

### **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.

- A parametric dataset with  $n < 20$  is evaluated with the Dixon's outlier test.
- A parametric dataset with  $n \geq 20$  is evaluated with the Rosner's outlier test.
- A non-parametric dataset is evaluated with the 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 exceeds the second highest data point by an order of magnitude, the highest point is considered an outlier.

### **Management of Data (ND data $\geq$ 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  $\geq$  the PQL:
  - o If  $\geq 50\%$  of the background dataset has detections  $\geq$  the method detection limit (MDL), any value  $\geq$  two times the PQL of background is considered an outlier.
  - o If  $< 50\%$  of the background dataset has detections  $\geq$  the MDL, any value  $\geq$  the PQL of background is considered an outlier.
- Two or more detections  $\geq$  the PQL:
  - o If  $\geq 50\%$  of the background dataset has detections  $\geq$  the MDL, any value  $\geq$  three times the PQL of background is considered an outlier.
  - o If  $< 50\%$  of the background dataset has detections  $\geq$  the MDL, any value  $\geq$  two times the PQL of background is considered an outlier.

Confirmed outliers, if any, are shown in the Summary of Groundwater Chemistry included in the Annual Water Quality Report.

#### **Detection Monitoring Statistical Program Statistical Evaluation**

Groundwater monitoring data associated with the Binns & Stevens MSWLF unit for the detection monitoring program is statistically analyzed by the diagnostic evaluations listed above and by interwell prediction limits, intrawell prediction limits, and the double quantification rule. The procedures for these evaluations are described below.

Interwell and intrawell prediction limits with retesting were selected for the determination of statistically significant increases (SSIs) over background for inorganic constituents with historical detections in background. Data from the most recent sampling event is compared to the prediction limits for the determination of SSIs.

#### ***Interwell Prediction Limits with Retesting***

- If the dataset has a normal distribution (or can be transformed to a normal distribution using Ladder of Powers), parametric interwell prediction limits are calculated if at least five datasets have been collected from the background monitoring point(s).
- If the dataset does not have a normal distribution (and cannot be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, nonparametric interwell prediction limits are calculated if at least five datasets have been collected from the background monitoring point(s).
- If an SSI above the prediction limit is indicated for AMD wells using both interwell and intrawell statistical methods, further evaluation will be performed regarding the impact of AMD on affected parameters.

#### ***Intrawell Prediction Limits with Retesting***

- If the dataset has a normal distribution (or can be transformed to a normal distribution using Ladder of Powers), parametric intrawell prediction limits are calculated if at least six samples have been collected.
- If the dataset does not have a normal distribution (and cannot be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, non-parametric intrawell prediction limits are calculated if at least six samples have been collected.
- If an SSI above the prediction limit is indicated for AMD wells using both interwell and intrawell statistical methods, further evaluation will be performed regarding the impact of AMD on affected parameters.

### **Updating the Background Dataset for Intrawell Prediction Limits**

If no SSI is confirmed for any two-year period, the intrawell background dataset is updated using the following procedure:

- Test the new dataset using the Shapiro-Wilk test for normal distribution either outright or through a transformation using Ladder of Powers.
- Test the new dataset for statistically significant outliers using the Ohio EPA Method and remove the confirmed outliers (see the “Management of Outliers” section).
- Test the new dataset for statistically significant trends using the Mann-Kendall/Sen’s Slope trend test. If a statistically significantly increasing trend is detected, the monitoring point will be placed into the assessment monitoring program or treated with the leachate, whichever is appropriate.
- If the dataset has a normal distribution and no statistically significant increasing trend is present, a two-sample Welch’s t-test at a 0.01 significance level is performed to compare current background to the most recent two years of detection monitoring data. If the Welch’s t-test is significant and shows that the most recent two years of concentration data appear to be increasing, the background will not be updated.
- If the dataset does not have a normal distribution and no statistically significant increasing trend is present, a two-sample non-parametric Wilcoxon rank-sum test (also known as the Mann-Whitney test) at a 0.01 significance level is performed to compare current background to the most recent two years of detection monitoring data. If the Wilcoxon rank-sum test is significant and shows that the most recent two years of concentration data appear to be increasing, the background will not be updated.
- If the Welch’s t-test or the Wilcoxon rank-sum tests are not significant, the most recent two years of detection data will be added to the intrawell background dataset.

The process will repeat every two years in which an SSI is not confirmed.

### **Double Quantification Rule**

The quasi-statistical “double quantification” rule is used for constituents not detected in the background monitoring points. If a constituent is detected in the compliance dataset that has not been historically detected in the background dataset, that constituent should be retested before the next regularly scheduled sampling event. If the retesting results confirm the original detection with a quantifiable detection, the SSI is confirmed, and the monitoring point is placed into the assessment monitoring program.

### **Assessment Monitoring Program Statistical Evaluation**

The assessment monitoring statistical evaluations are performed using the most recent eight samples or all samples if less than eight samples are available. Transformation of the distribution is not considered. The analysis is performed for organic parameters for monitoring wells in the assessment monitoring program.

### **Confidence Intervals or Confidence Bands**

- A parametric confidence interval around a normal mean is calculated if the dataset has a normal distribution and no statistically significant trend is present.
- A non-parametric confidence interval around a median is calculated if the dataset does not have a normal distribution and no statistically significant trend is present.
- Non-parametric confidence bands around a Theil-Sen trend line are calculated if the dataset has a statistically significant trend.

In the event that the lower confidence limit or any part of the lower confidence band, as appropriate, exceeds the GWPS, then the monitoring point is declared out of compliance, and an assessment of corrective measures (ACM) is required.

### **Statistical Software Output**

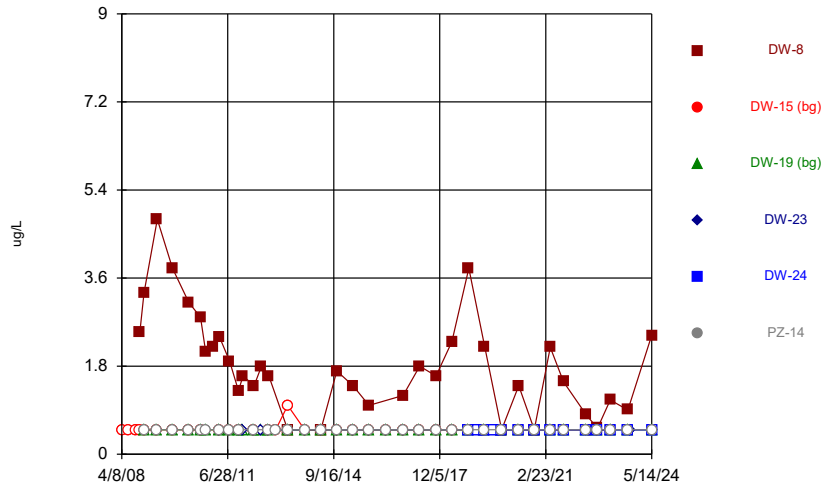
Sanitas™ statistical software was used to perform the statistical evaluations. Statistical outputs for the 1<sup>st</sup> and 2<sup>nd</sup> 2024 statistical evaluations are included in Attachments A and B of this appendix, respectively.

**Attachment A**  
**1<sup>st</sup> 2024 Statistical Evaluation Output**

## **Time Series Plots**

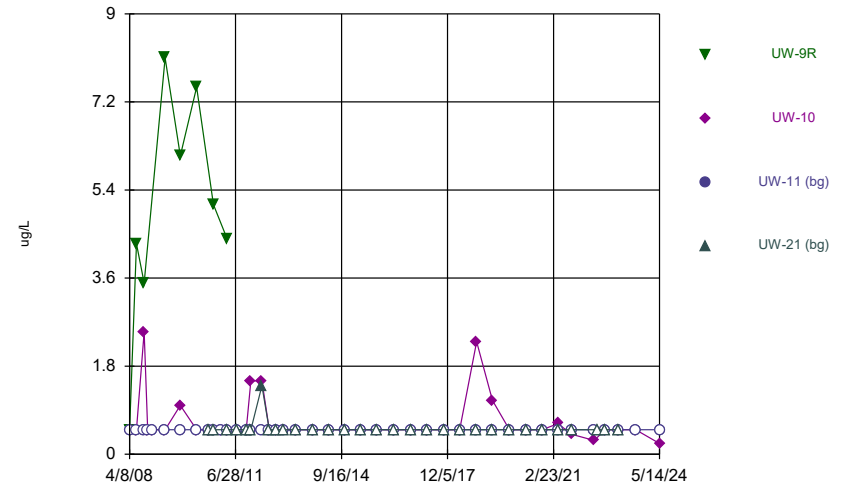


### Time Series



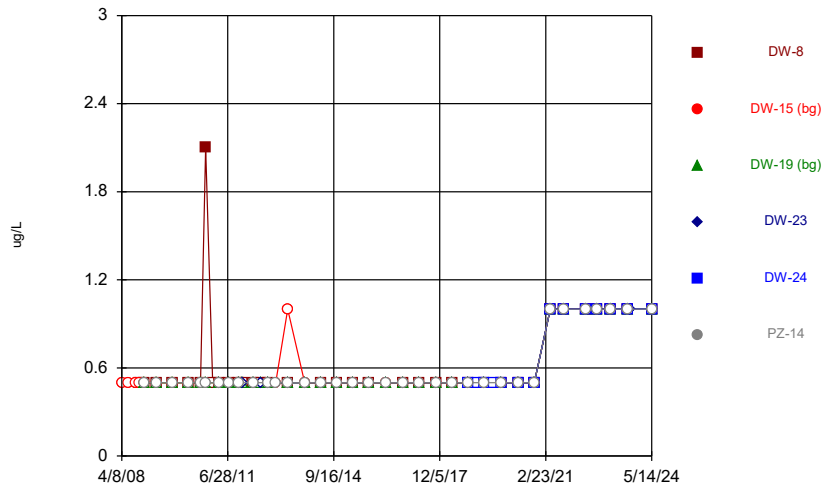
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



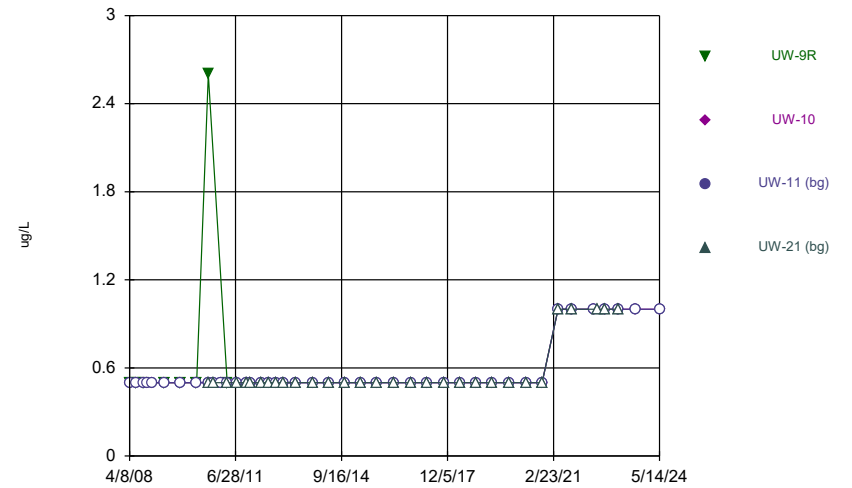
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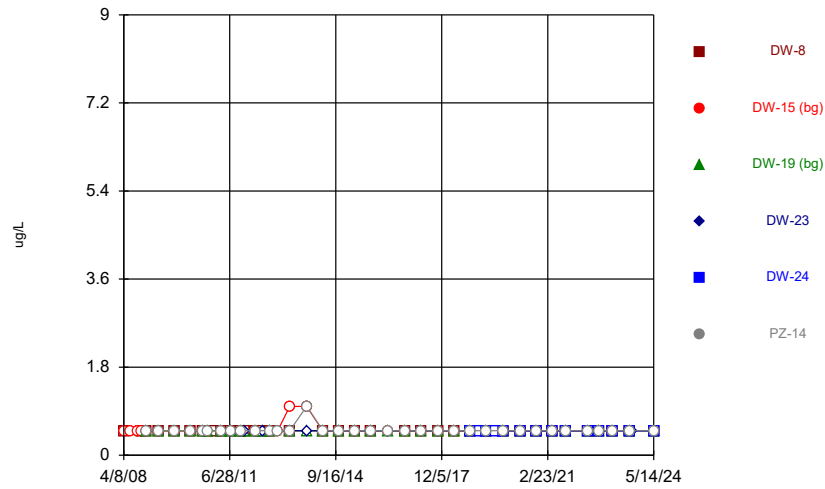
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### Time Series



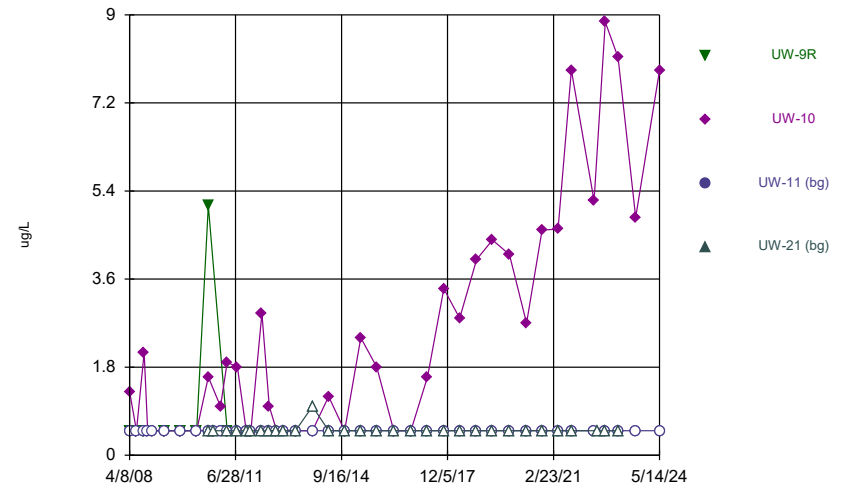
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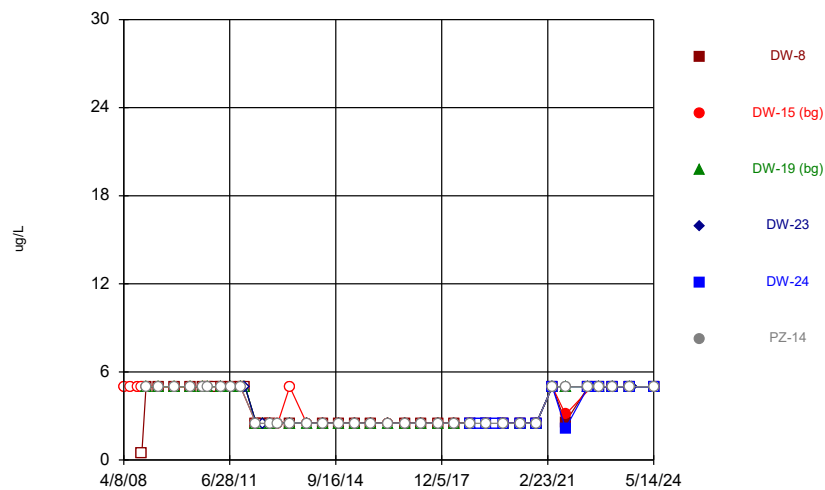
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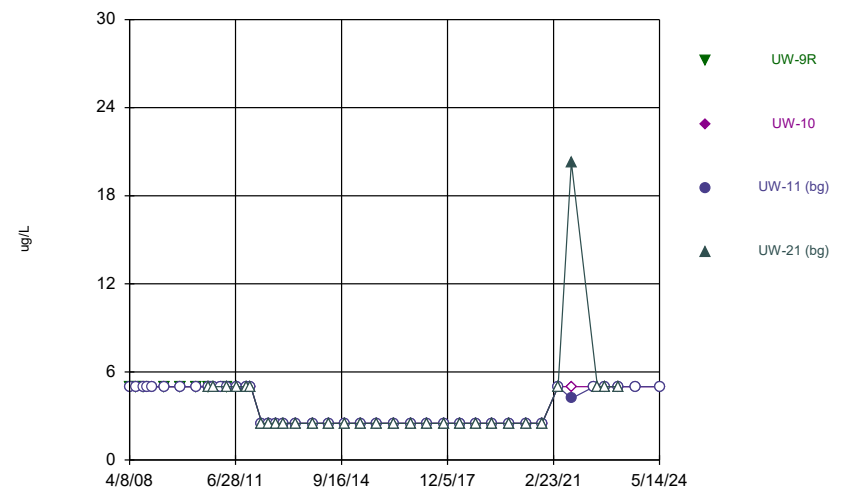
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



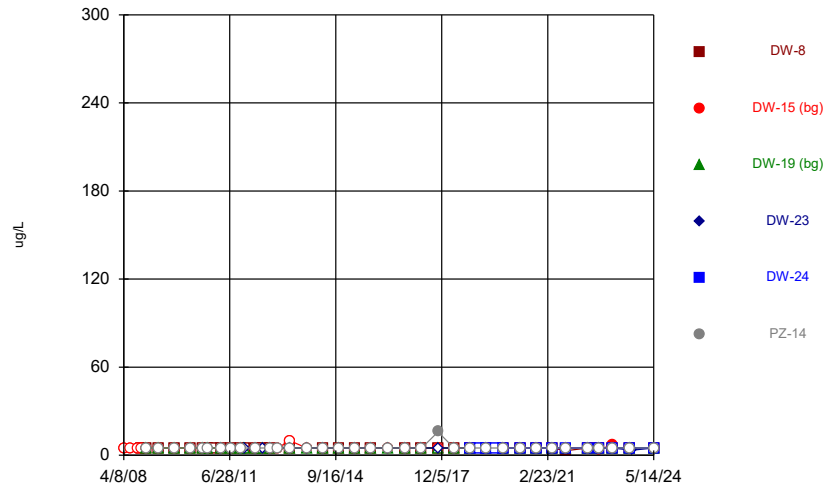
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

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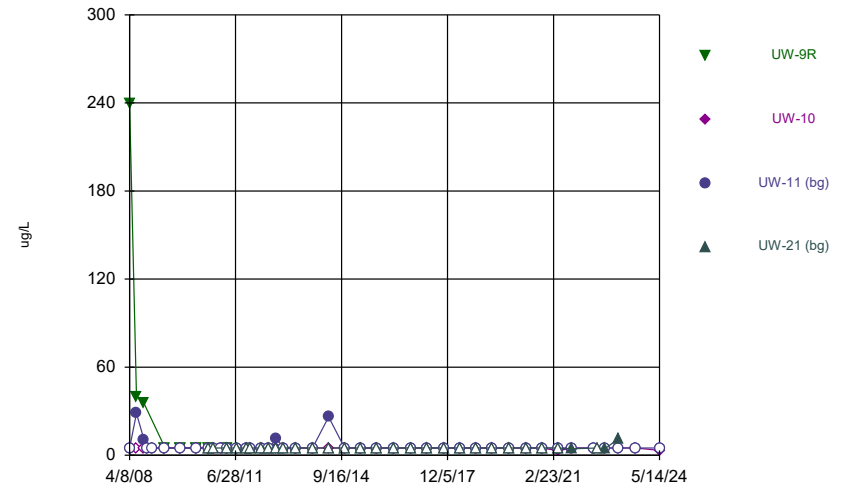


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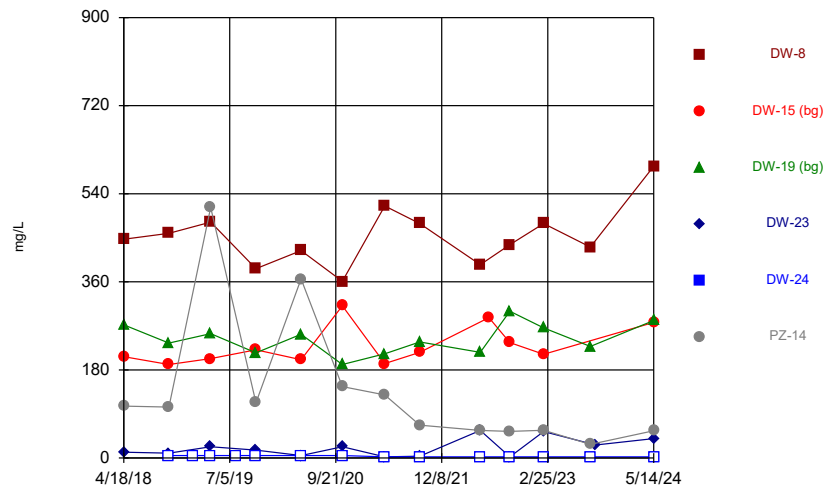
Time Series



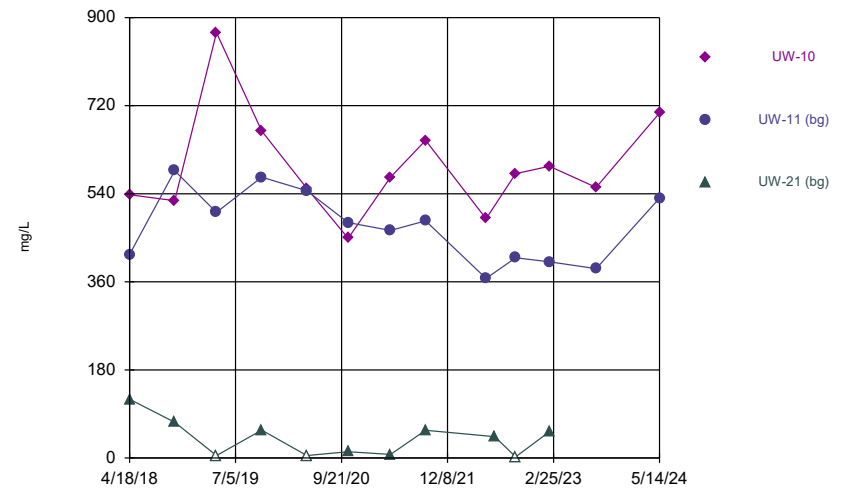
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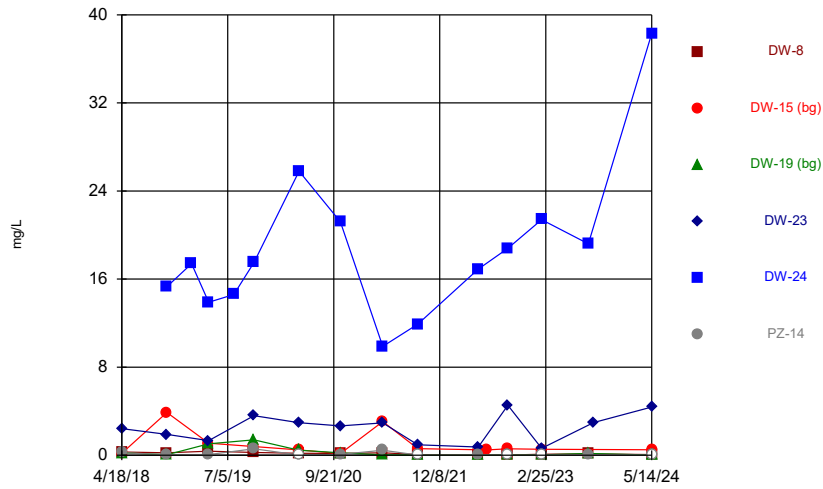
Time Series



Time Series

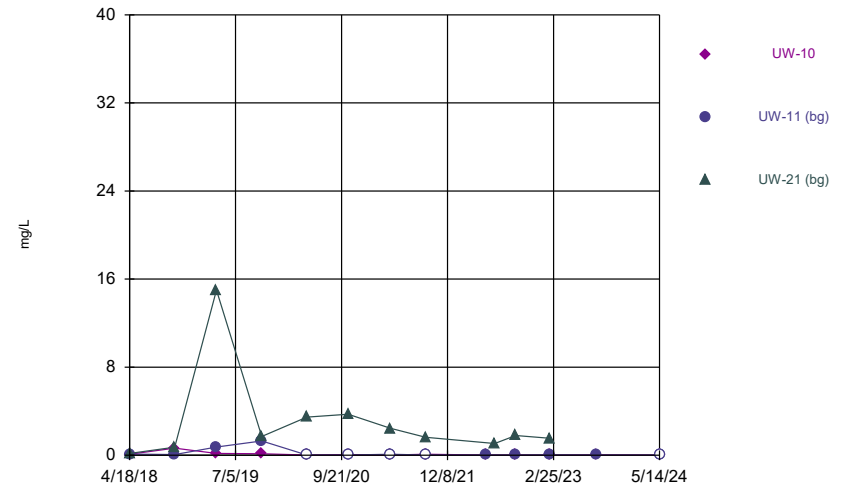


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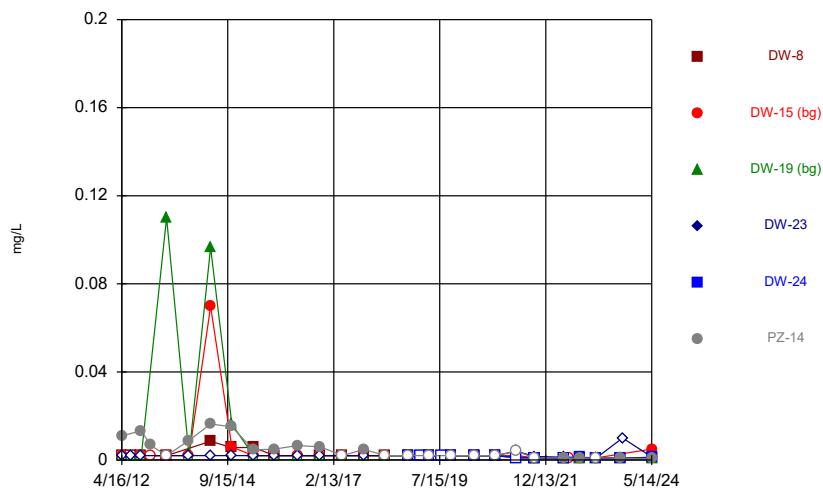
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



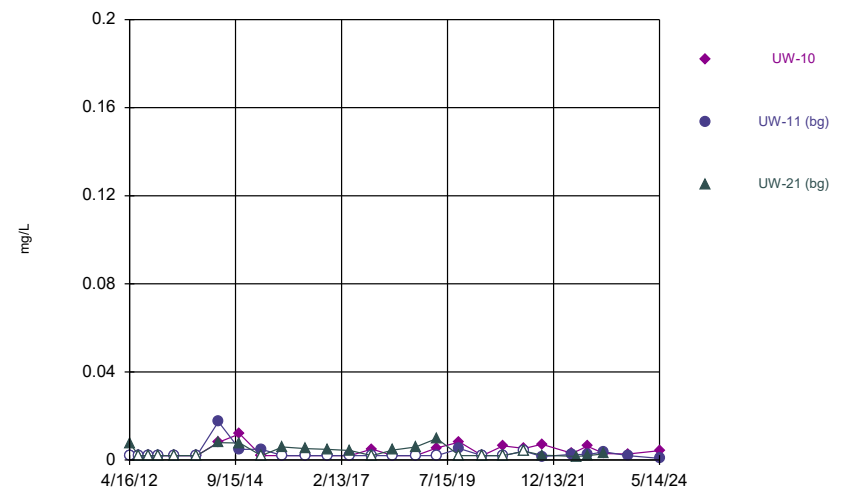
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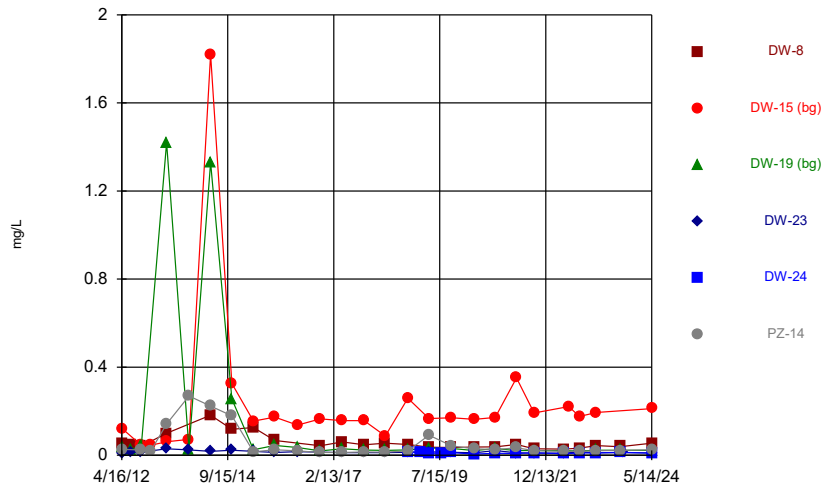
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



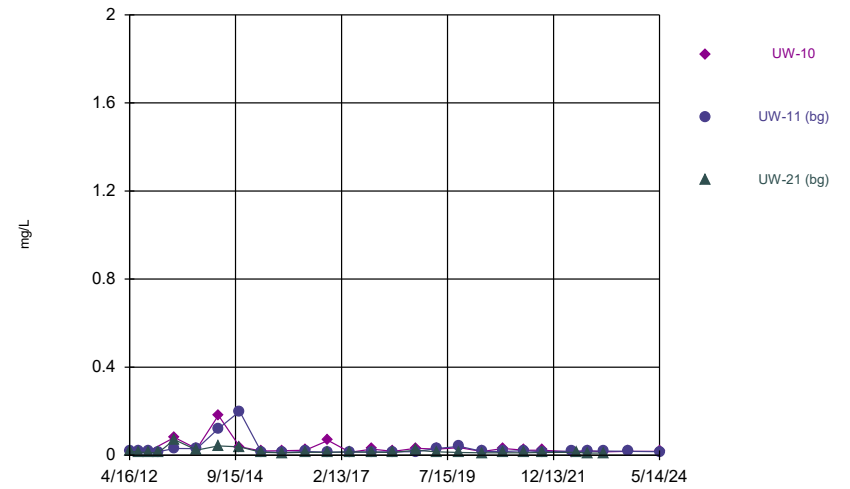
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



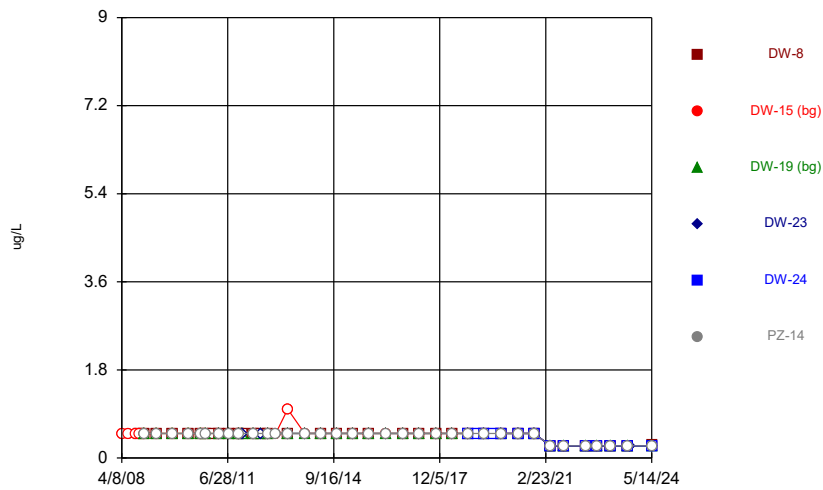
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### Time Series



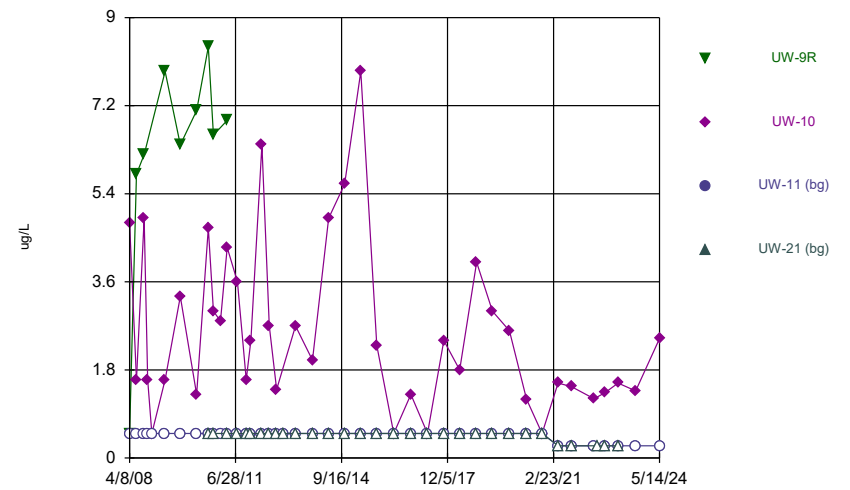
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### Time Series



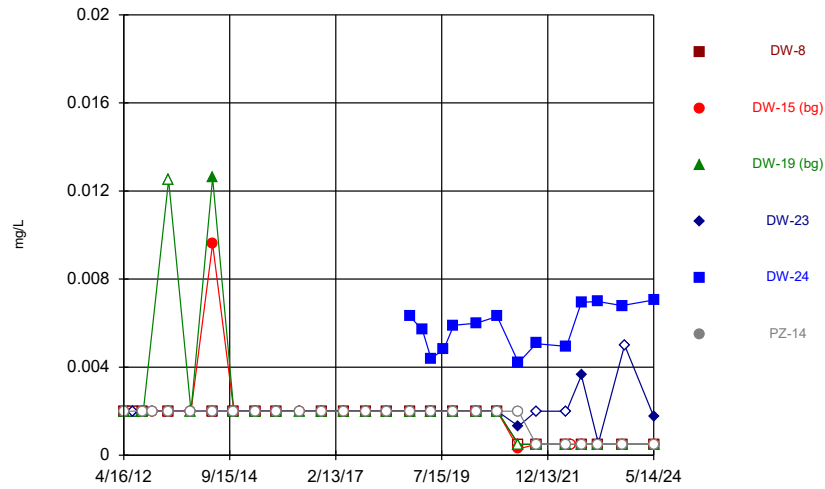
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### Time Series



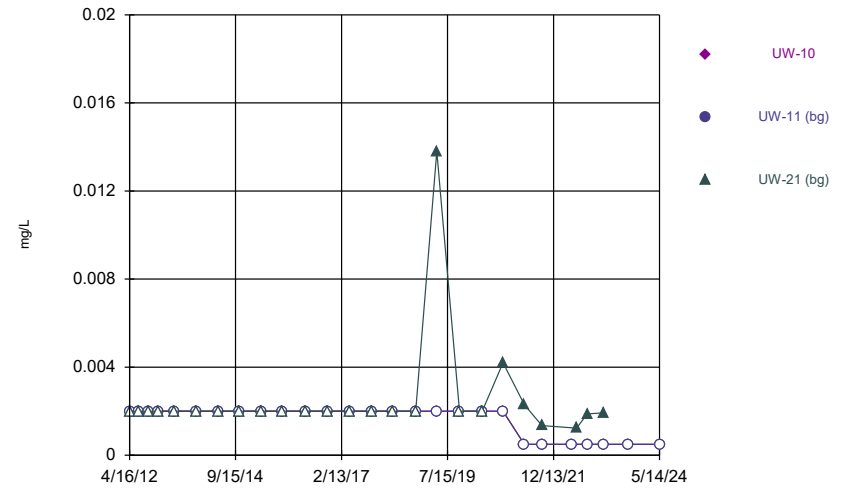
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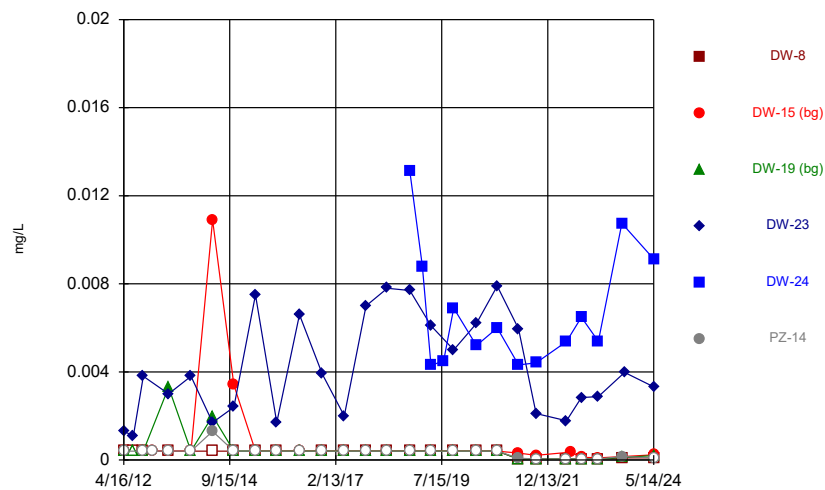
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### Time Series



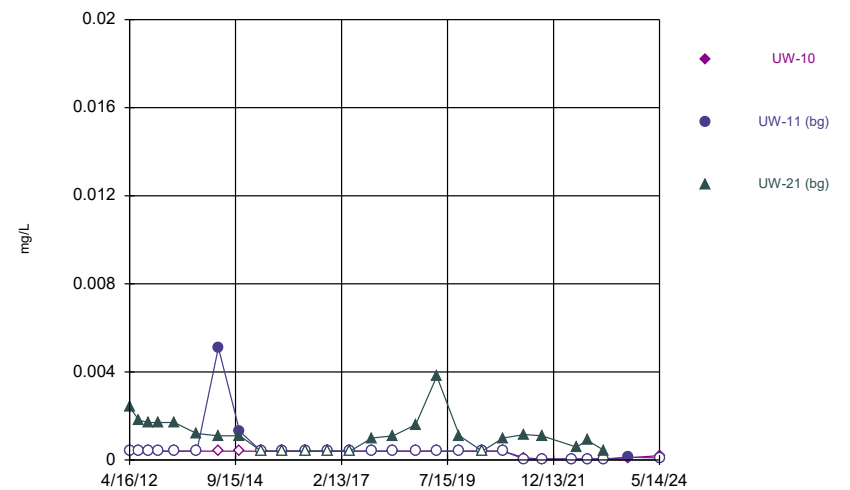
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



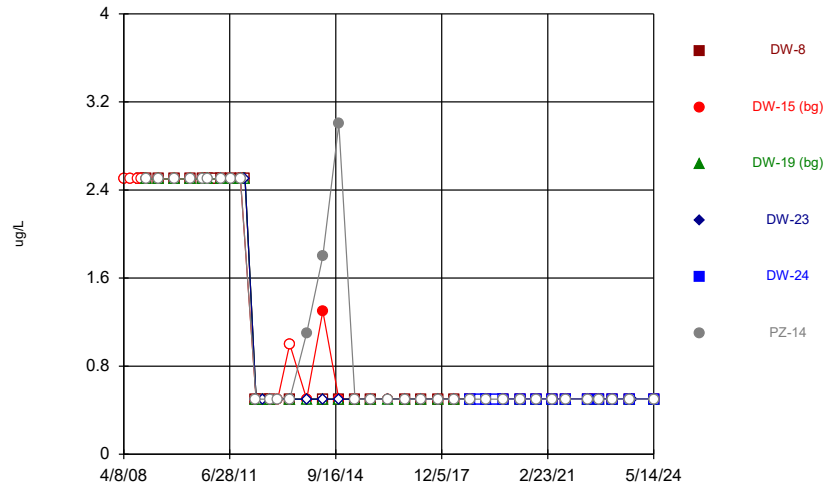
Constituent: Cadmium Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



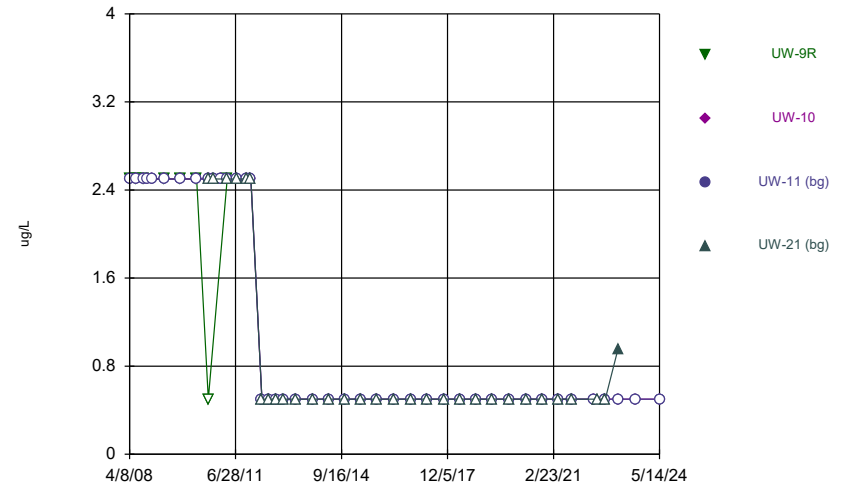
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



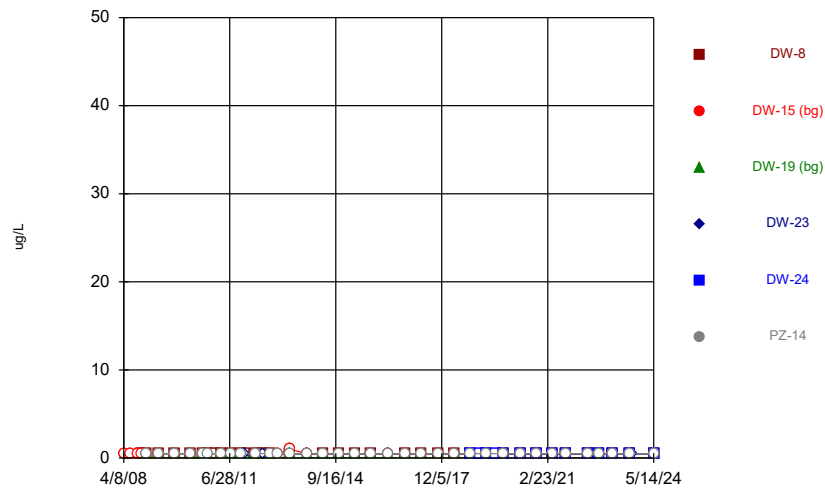
Constituent: Carbon Disulfide Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



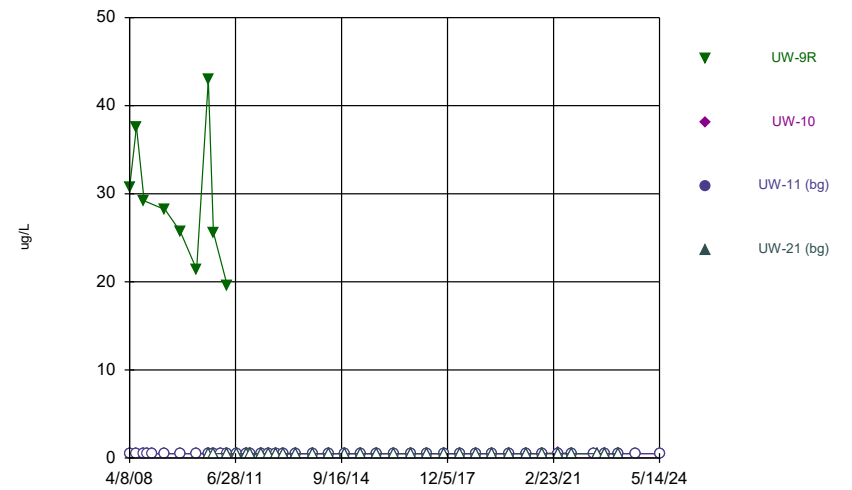
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



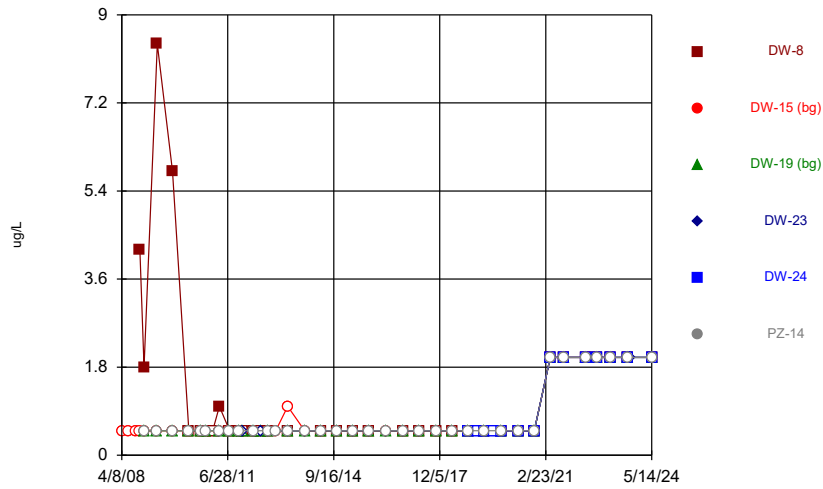
Constituent: Chlorobenzene Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



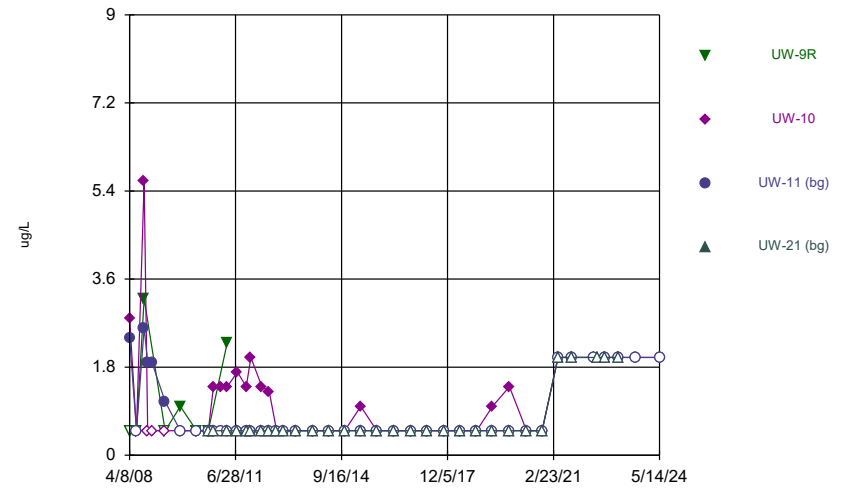
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



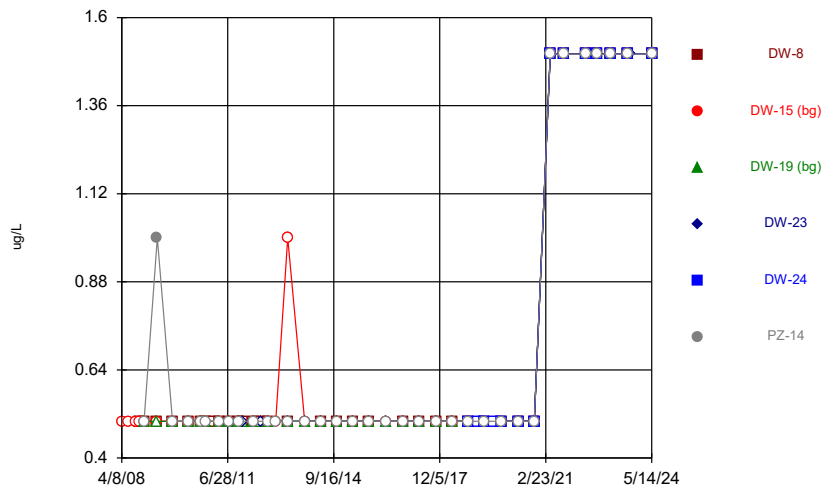
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



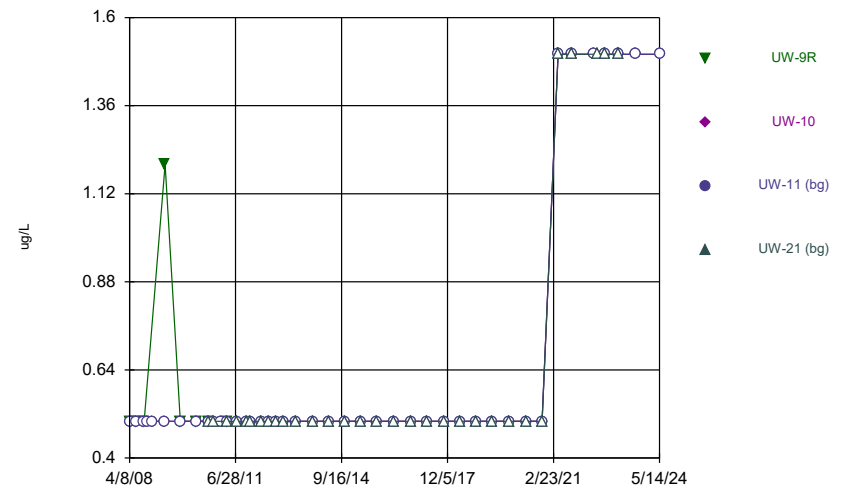
Constituent: Chloroethane Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Chloroform Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

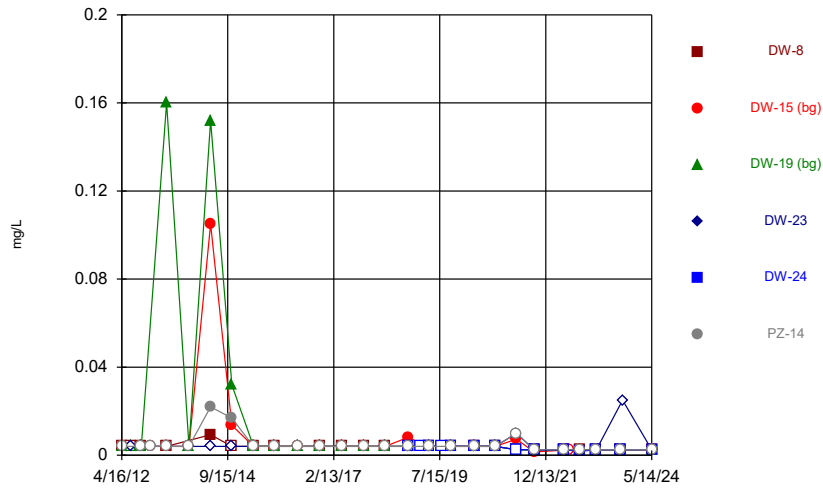
### Time Series



Constituent: Chloroform Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

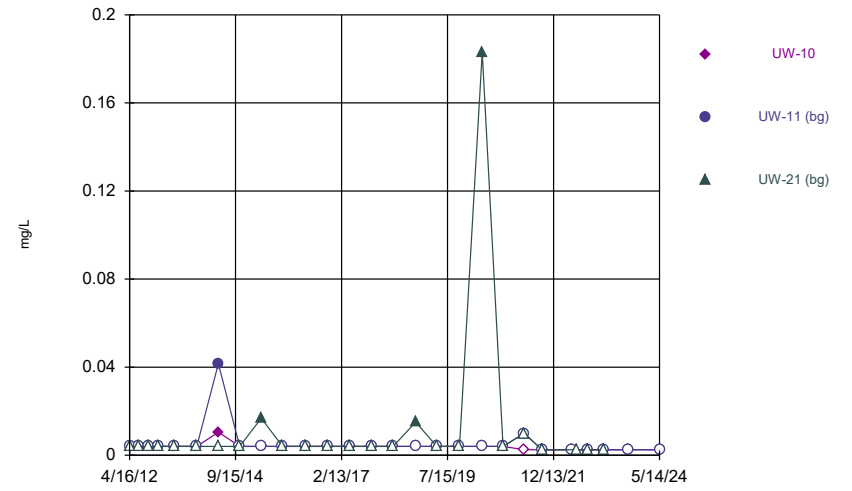


### Time Series



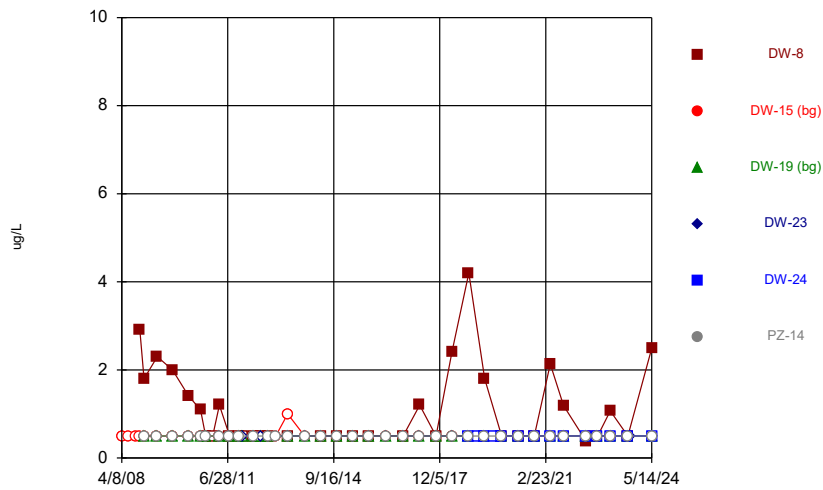
Constituent: Chromium Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



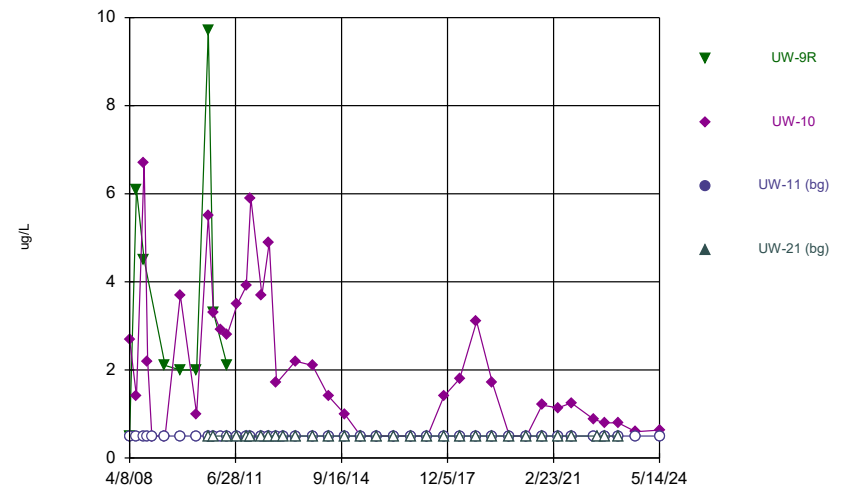
Constituent: Chromium Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



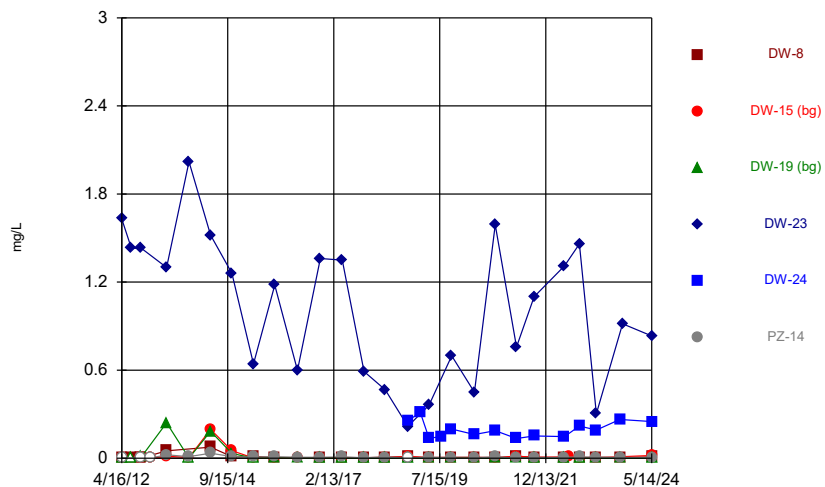
Constituent: cis-1,2-Dichloroethene Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



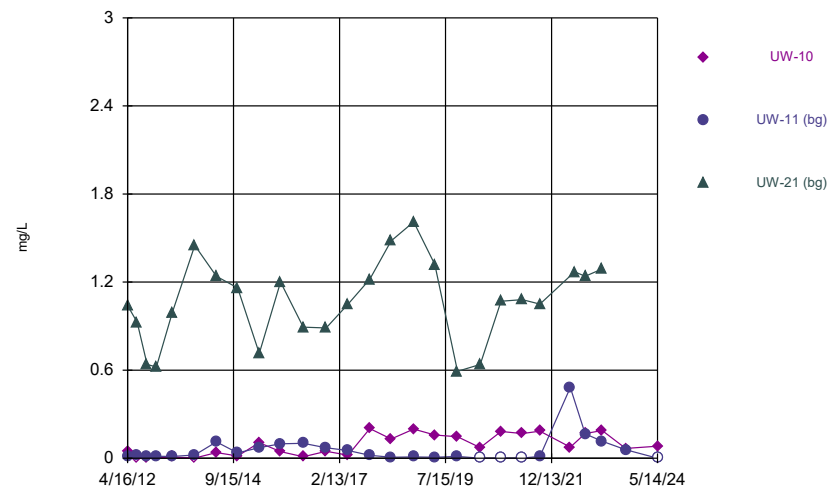
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



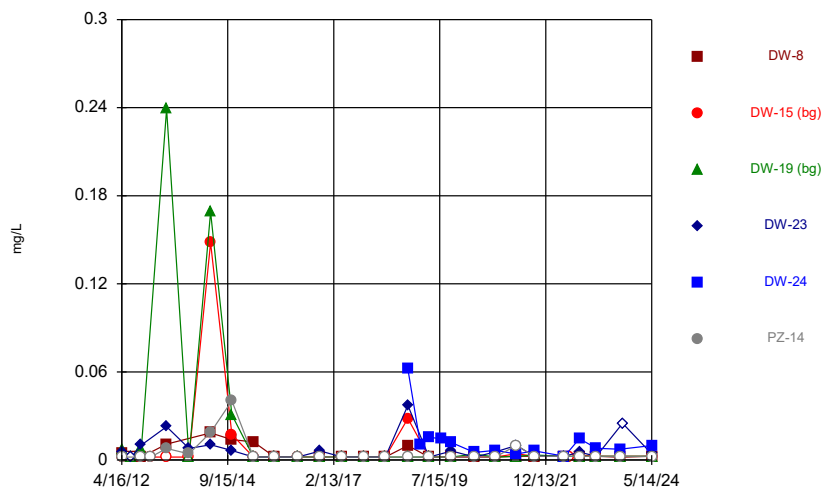
Constituent: Cobalt Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



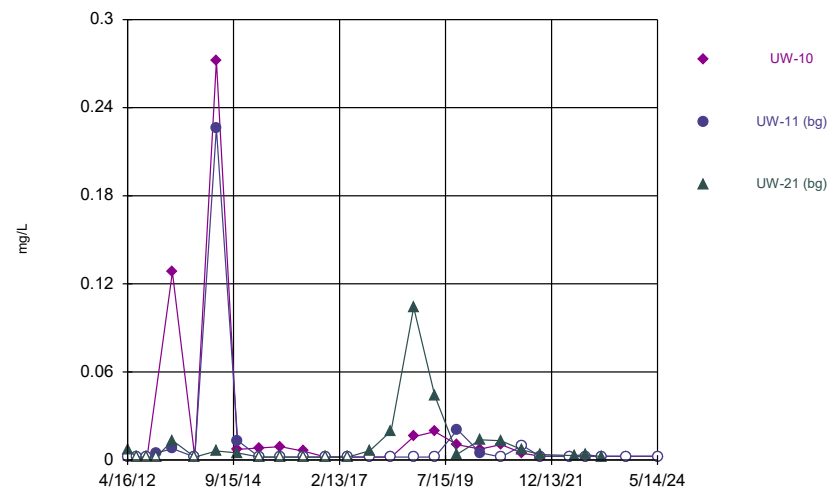
Constituent: Cobalt Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



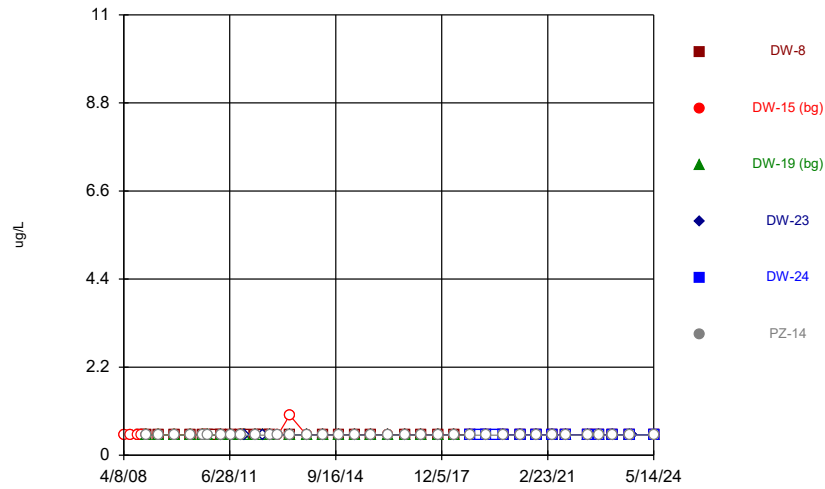
Constituent: Copper Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



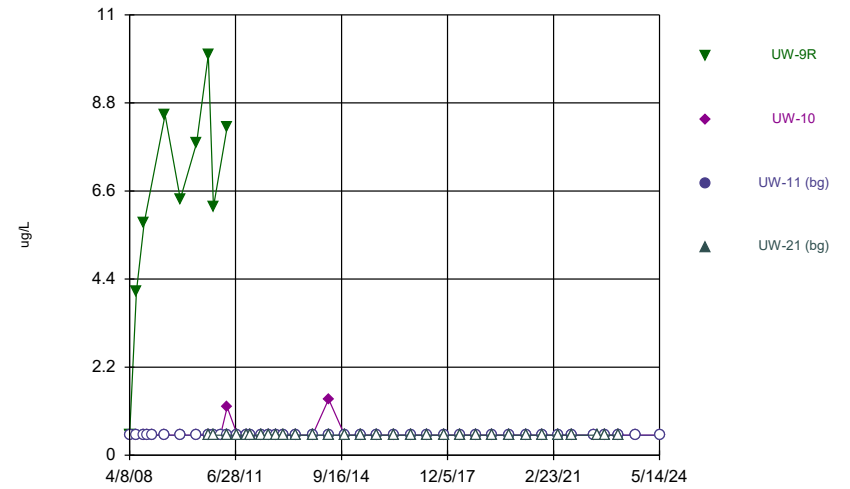
Constituent: Copper Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



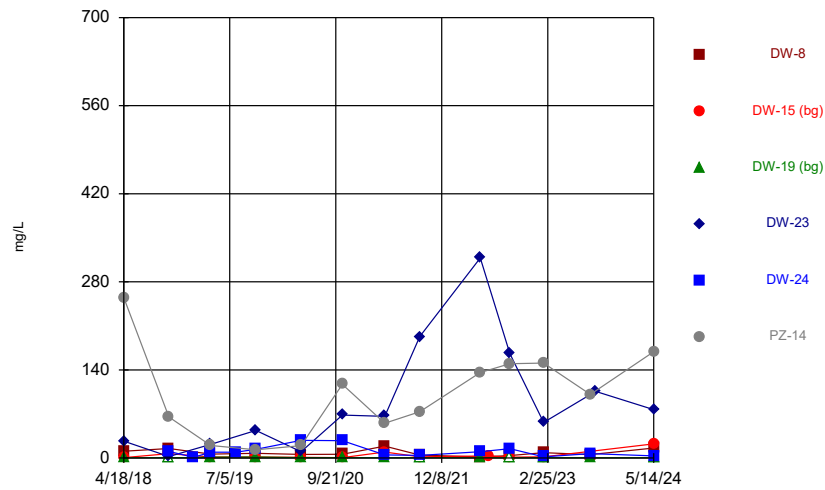
Constituent: Ethylbenzene Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



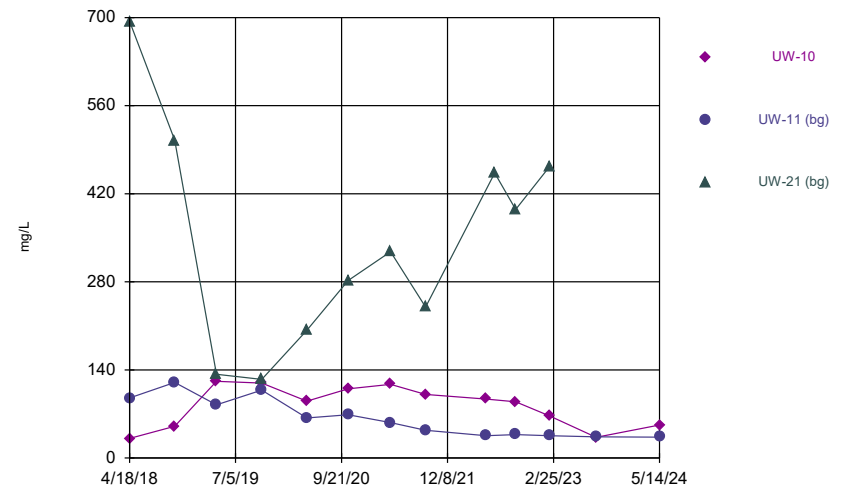
Constituent: Ethylbenzene Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



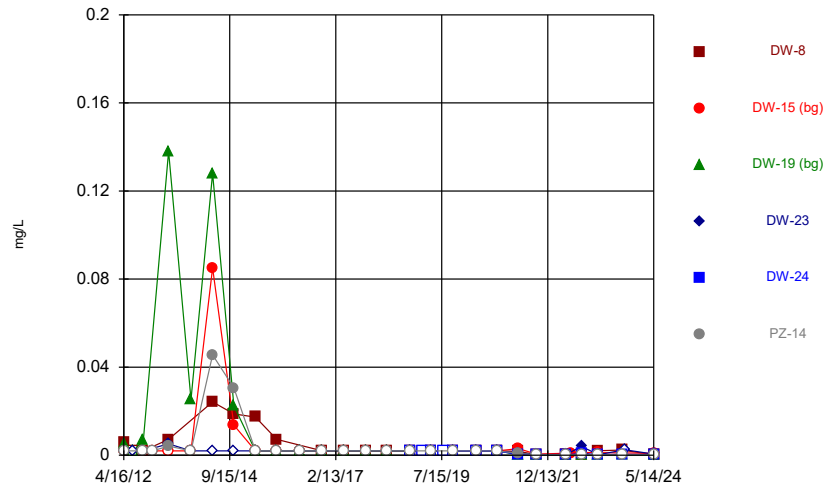
Constituent: Iron Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



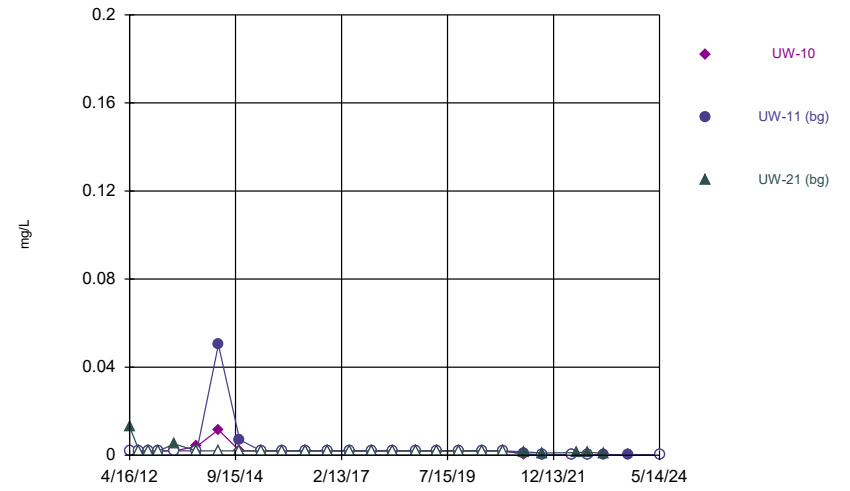
Constituent: Iron Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



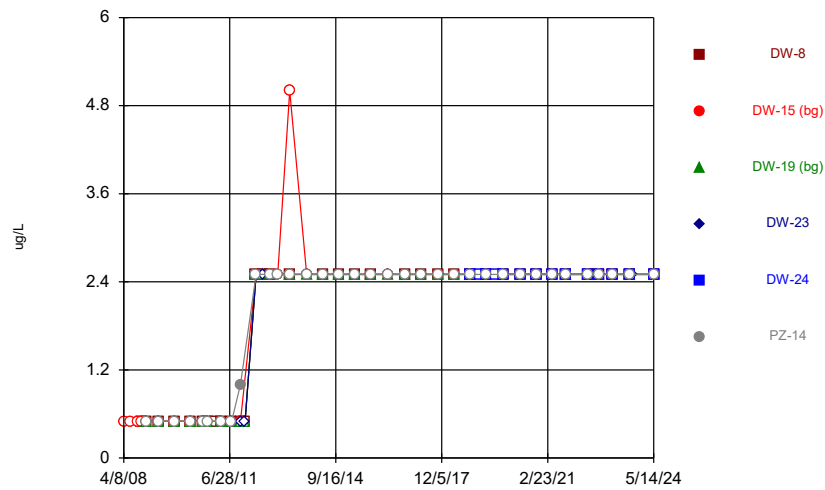
Constituent: Lead Analysis Run 8/23/2024 10:42 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



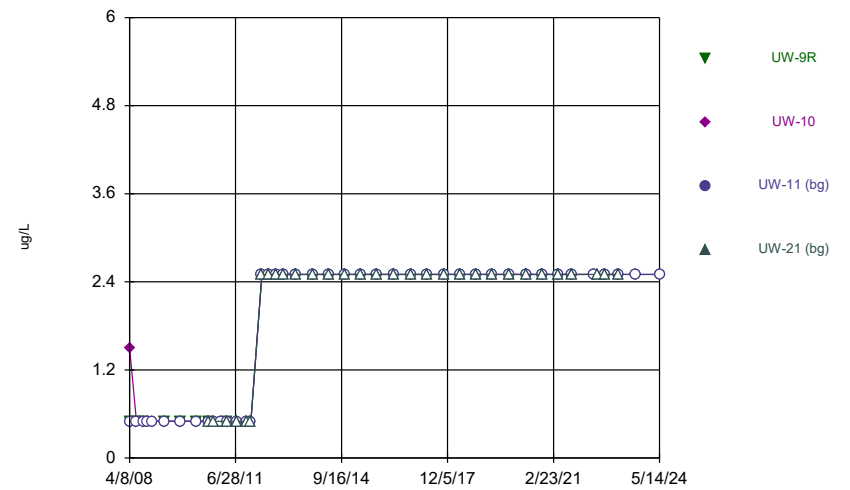
Constituent: Lead Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



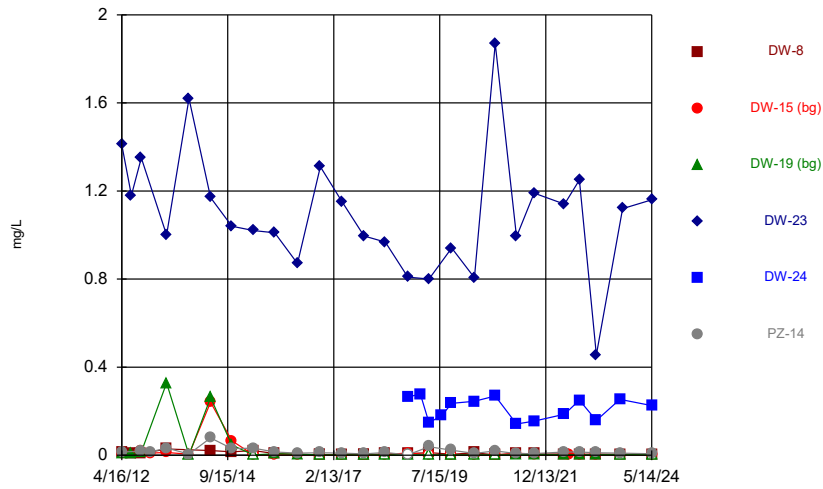
Constituent: Methylene Chloride Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



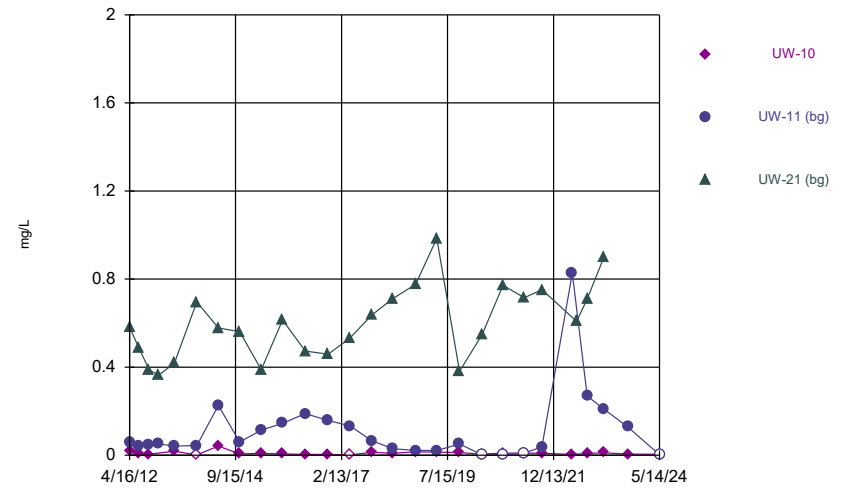
Constituent: Methylene Chloride Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



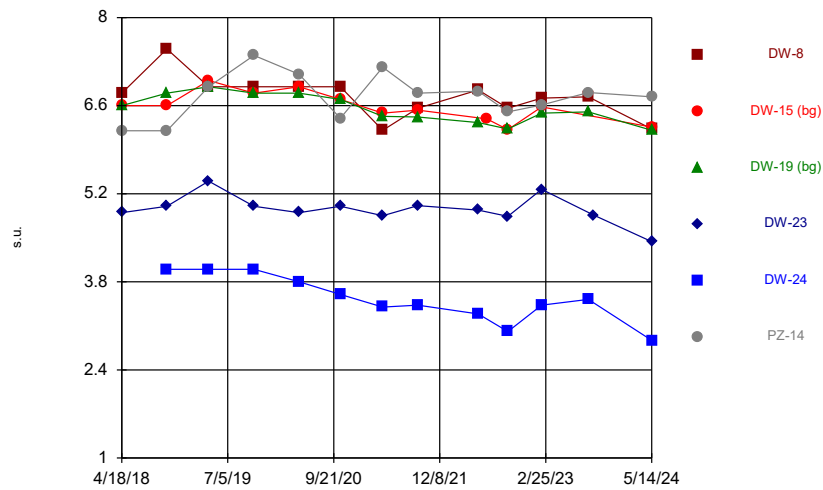
Constituent: Nickel Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



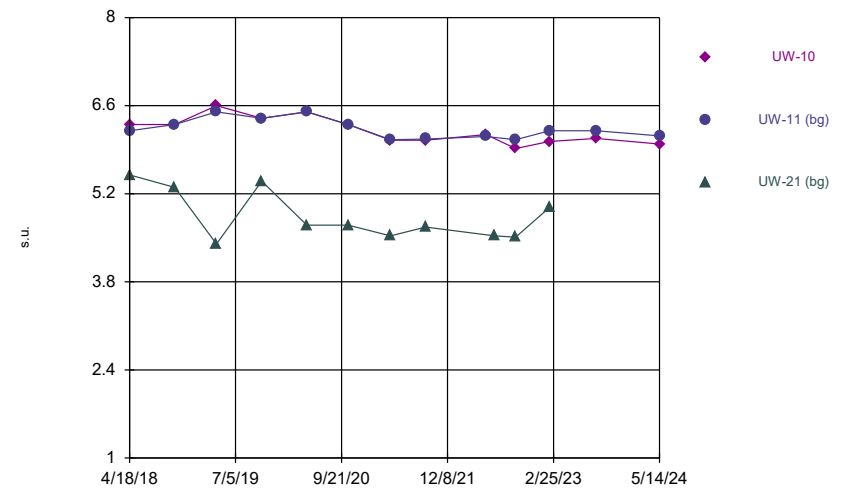
Constituent: Nickel Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



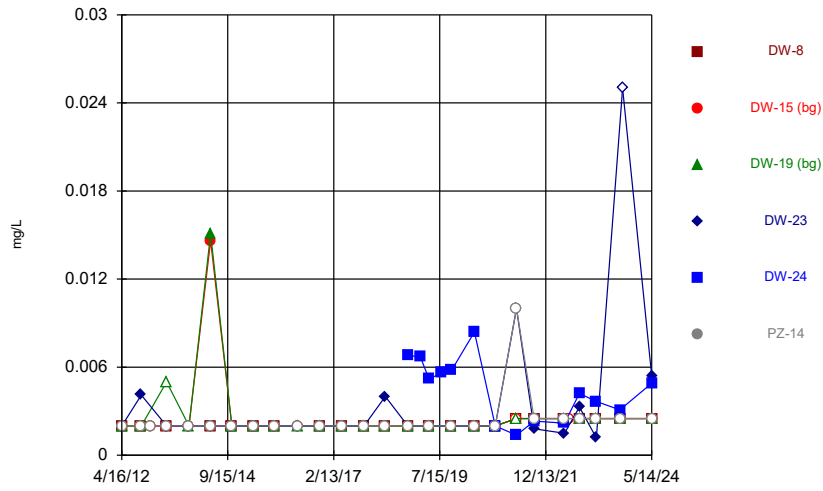
Constituent: pH Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



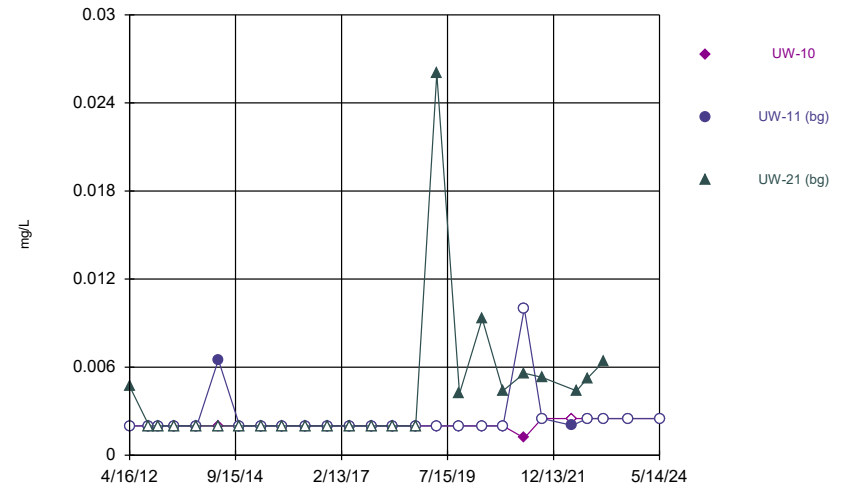
Constituent: pH Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



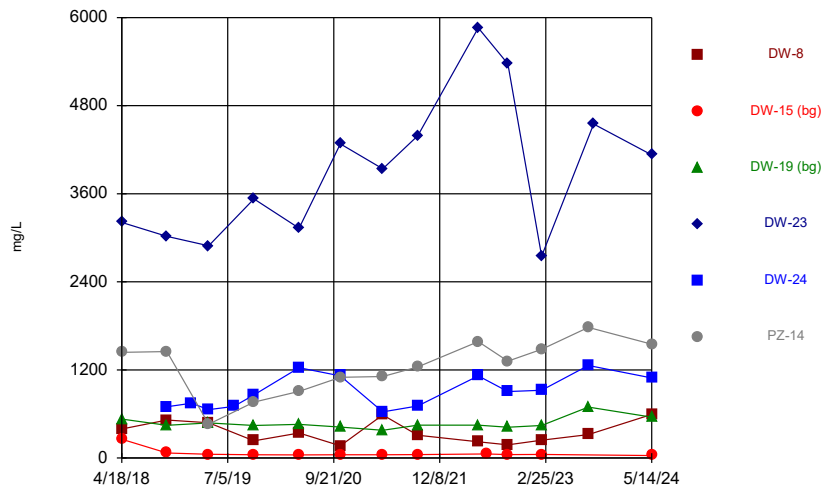
Constituent: Selenium Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



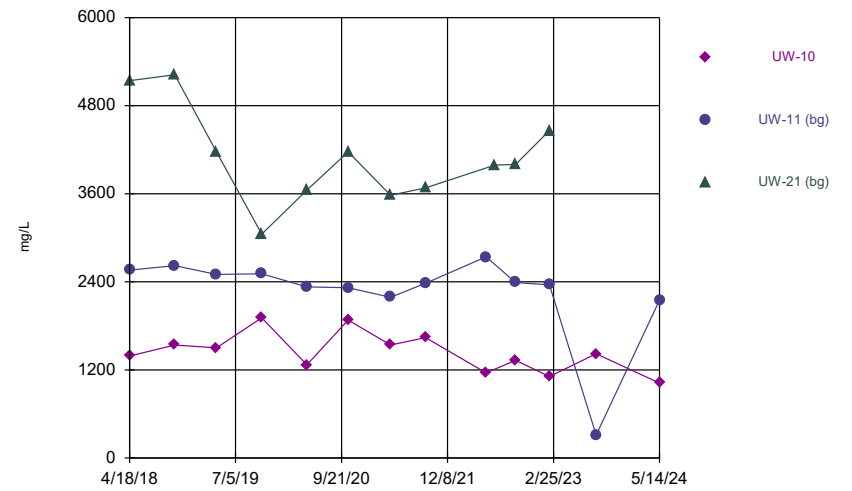
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



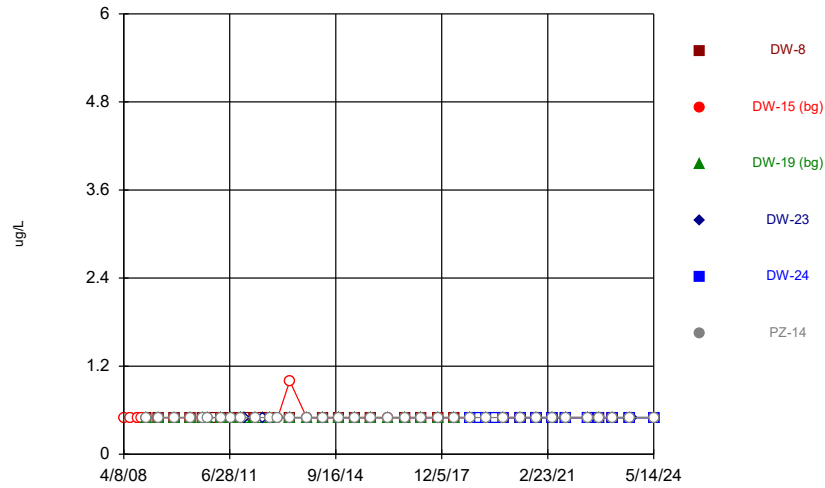
Constituent: Sulfate Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



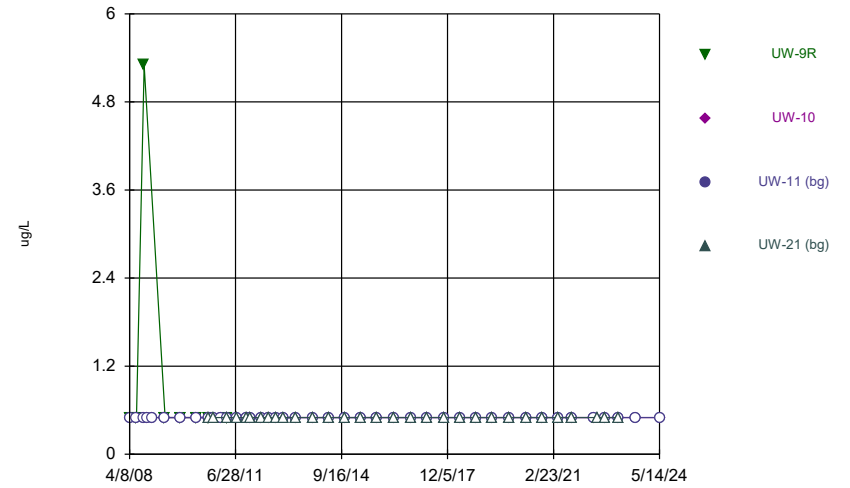
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



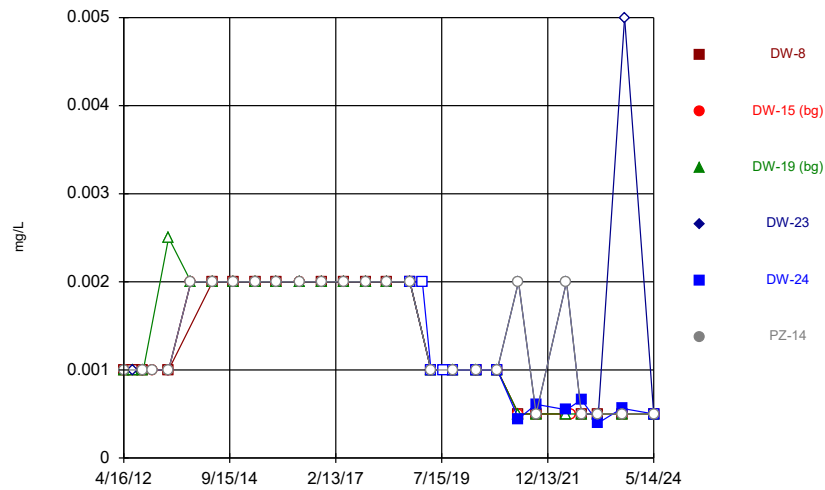
Constituent: Tetrachloroethene Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



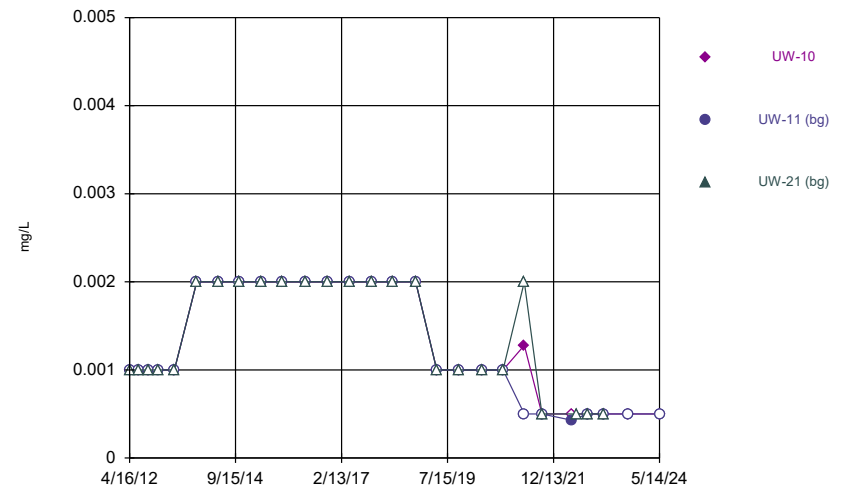
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



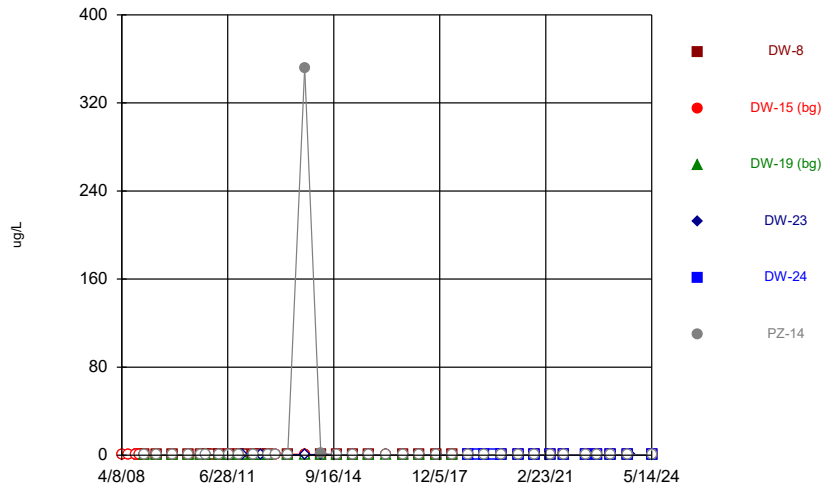
Constituent: Thallium Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



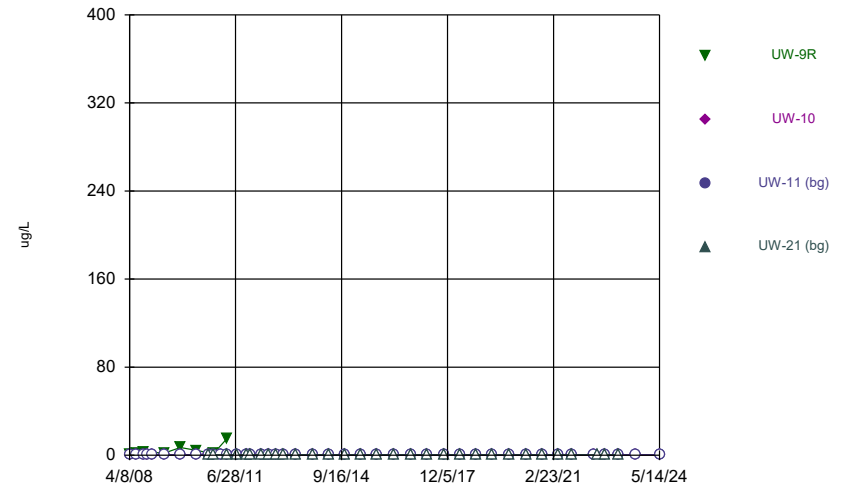
Constituent: Thallium Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



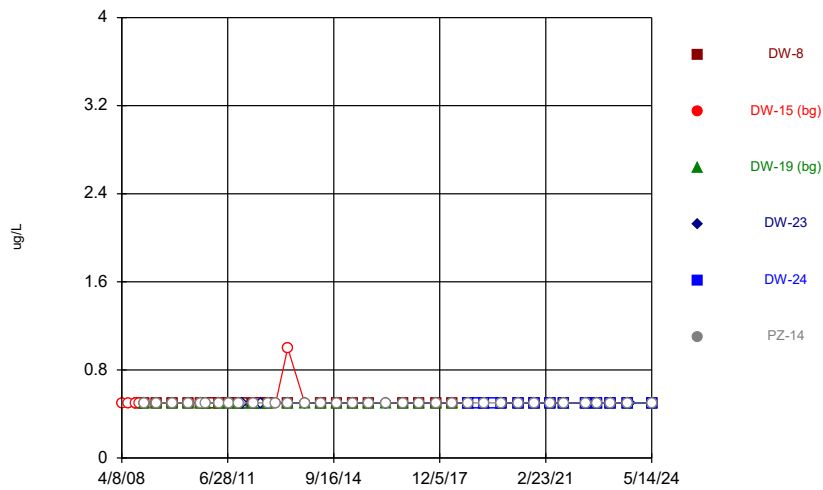
Constituent: Toluene Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



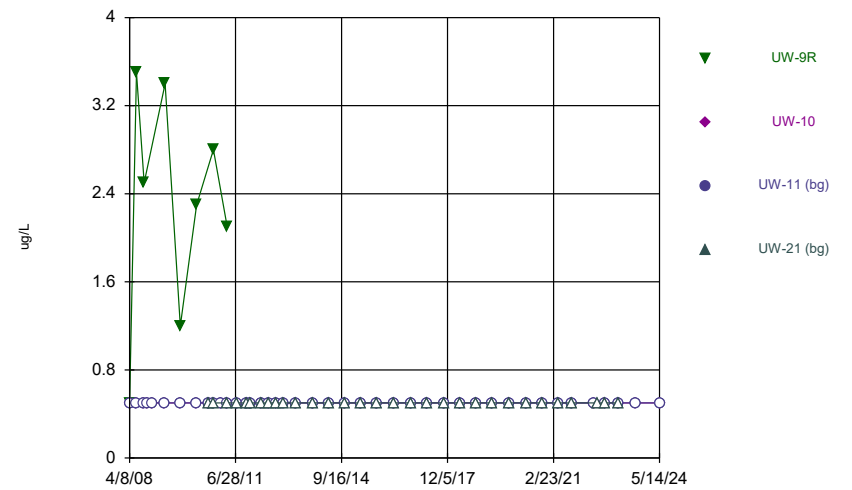
Constituent: Toluene Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Trichloroethene Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

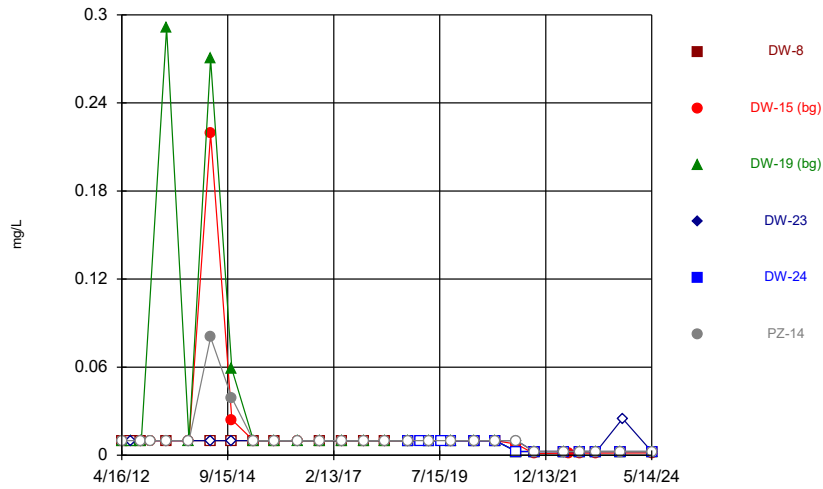
### Time Series



Constituent: Trichloroethene Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

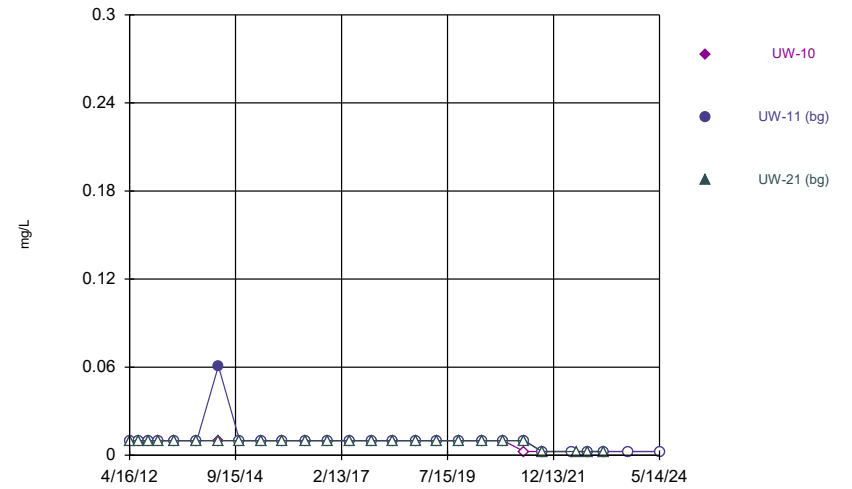


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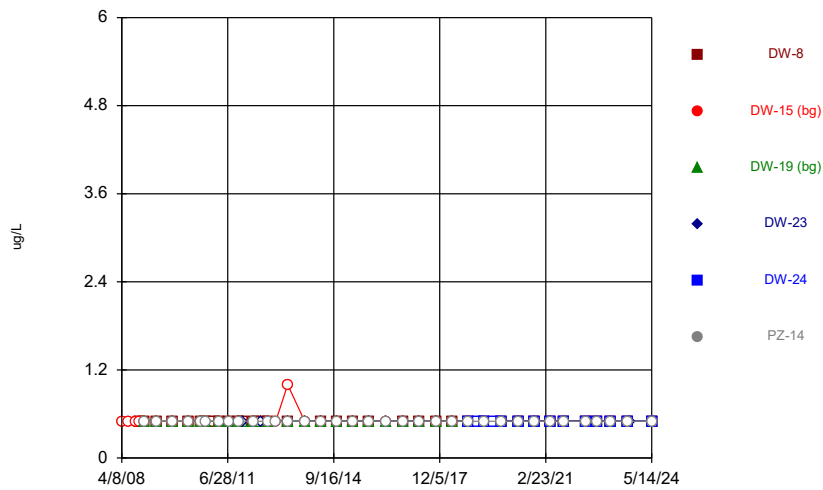
Constituent: Vanadium Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



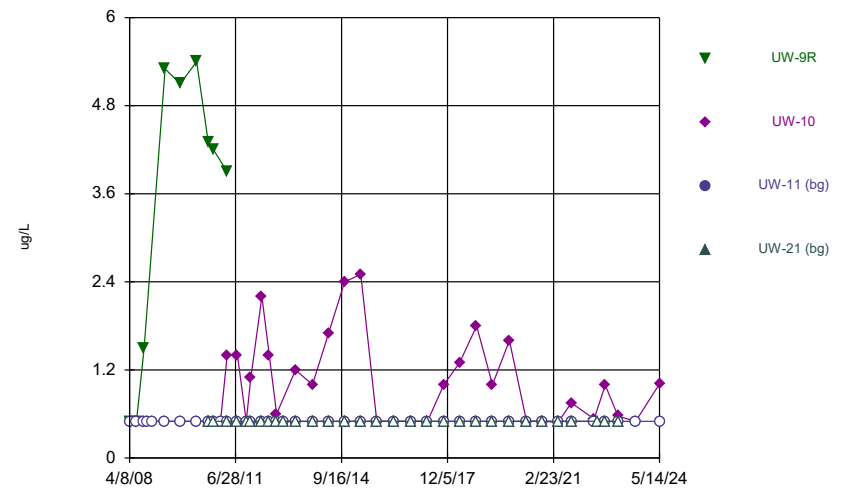
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



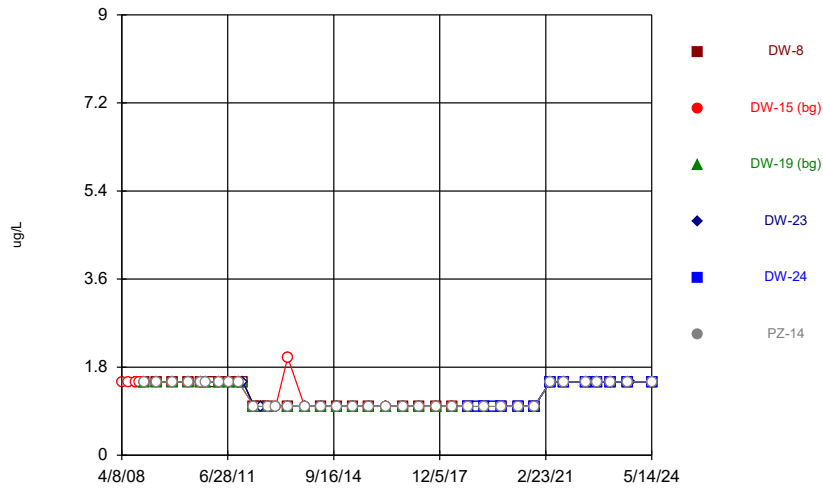
Constituent: Vinyl Chloride Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



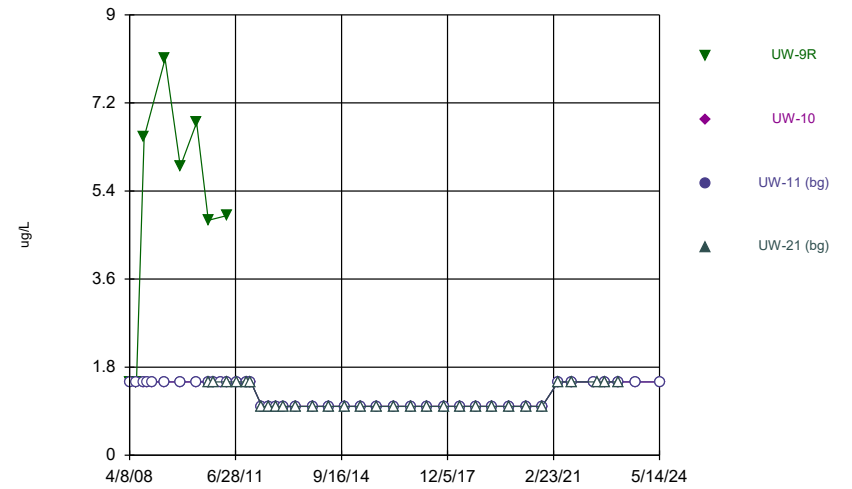
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



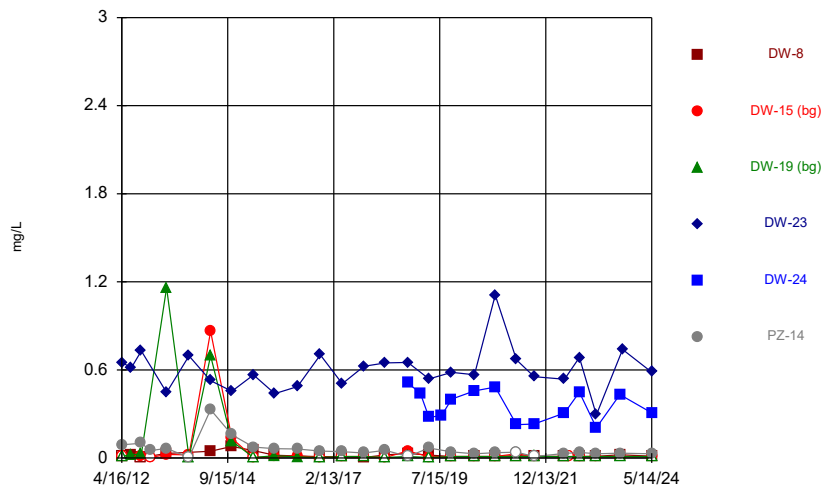
Constituent: Xylenes, total Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



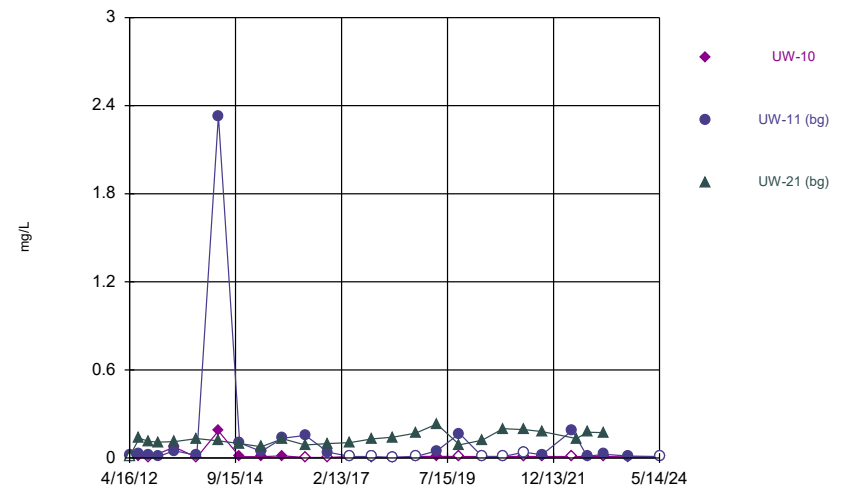
Constituent: Xylenes, total Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Zinc Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Zinc Analysis Run 8/23/2024 10:43 PM View: 2024SSN Time Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

## **Outlier Tests Summary Table and Graphs**

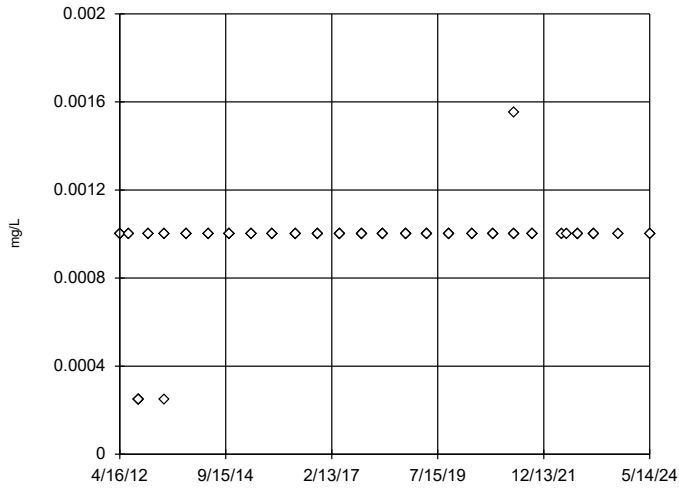
# BG Outlier Analysis

Mahaska County SLF Client: SCS Engineers Data: MCSWMM Master Active Printed 8/23/2024, 10:55 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Normality Test</u>
Antimony (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	OH	NaN 103	0.0009689	0.0001719	n/a
<b>Arsenic (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0698,0.0059,0.0059,0.0059,0.005,0.11,0.0965,0.0</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN 103</b>	<b>0.005438</b>	<b>0.01556</b>	<b>ShapiroFrancia</b>
<b>Barium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>1.82,0.326,0.351,1.42,1.33</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN 103</b>	<b>0.1038</b>	<b>0.2609</b>	<b>ChiSquared</b>
<b>Beryllium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0138,0.0126,0.0125,0.0096</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 103</b>	<b>0.002109</b>	<b>0.002147</b>	<b>n/a</b>
Cadmium (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN 103	0.000758	0.001292	ChiSquared
<b>Chromium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.183,0.16,0.152,0.105,0.0416,0.0319,0.0168</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 103</b>	<b>0.01049</b>	<b>0.02918</b>	<b>n/a</b>
Cobalt (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN 103	0.2821	0.4708	ChiSquared
<b>Copper (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.148,0.0174,0.0283,0.239,0.169,0.0308,0.226,0.01</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN 103</b>	<b>0.0131</b>	<b>0.03939</b>	<b>ShapiroFrancia</b>
Lead (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN 103	0.006305	0.02054	ShapiroFrancia
Nickel (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN 103	0.186	0.2691	ChiSquared
<b>Selenium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.026,0.0151,0.0146,0.01,0.0093</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 100</b>	<b>0.003057</b>	<b>0.003214</b>	<b>n/a</b>
<b>Silver (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.005</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 103</b>	<b>0.001684</b>	<b>0.0007115</b>	<b>n/a</b>
<b>Thallium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0025</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 103</b>	<b>0.001334</b>	<b>0.0006403</b>	<b>n/a</b>
<b>Vanadium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.291,0.27,0.219,0.0607,0.0587</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN 103</b>	<b>0.01671</b>	<b>0.0434</b>	<b>n/a</b>
<b>Zinc (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.864,1.16,0.697,2.33</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN 103</b>	<b>0.1</b>	<b>0.2734</b>	<b>ChiSquared</b>

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

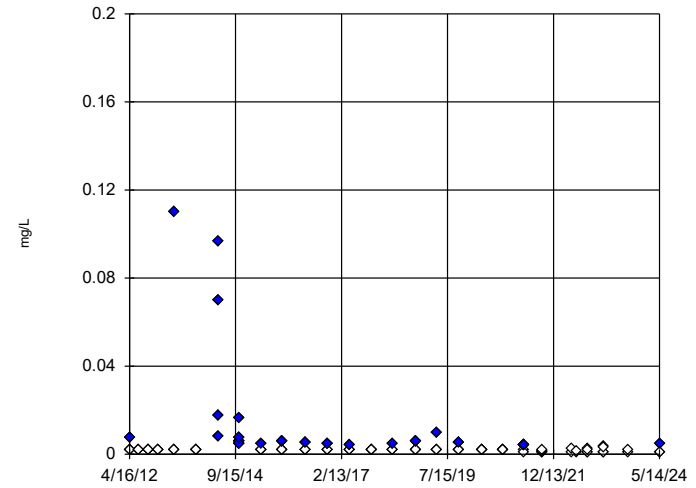


n = 103  
No statistical outliers.

Constituent: Antimony Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

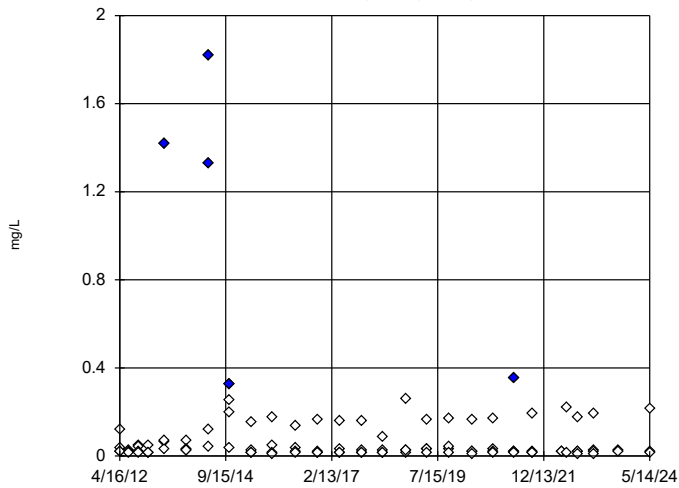


n = 103  
Outliers are drawn as solid.  
Tukey's method used in lieu of parametric test because the Shapiro Francia normality test failed at the 0.01 alpha level.  
High cutoff = 0.0038, low cutoff = 0.00065, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

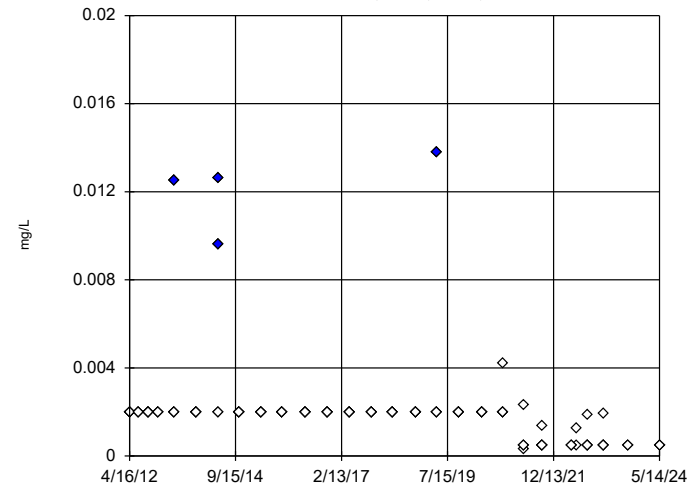


n = 103  
Outliers are drawn as solid.  
Tukey's method used in lieu of parametric test because the Chi Squared normality test failed at the 0.01 alpha level.  
High cutoff = 0.2997, low cutoff = -0.1959, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

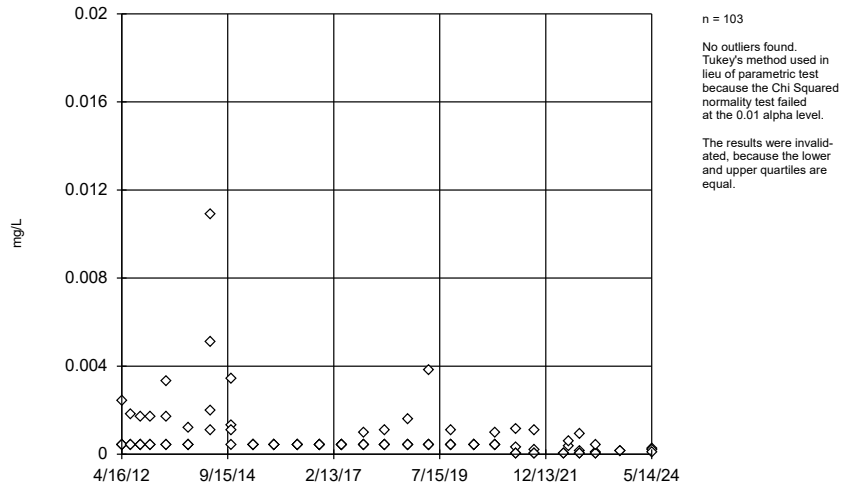


n = 103  
Statistical outliers are drawn as solid.  
Outliers per Ohio method.

Constituent: Beryllium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

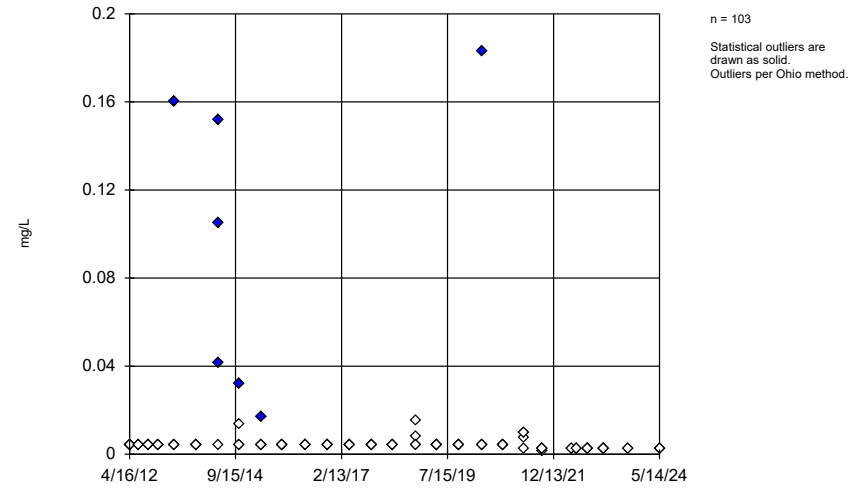
DW-15,DW-19,UW-11,UW-21



Constituent: Cadmium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

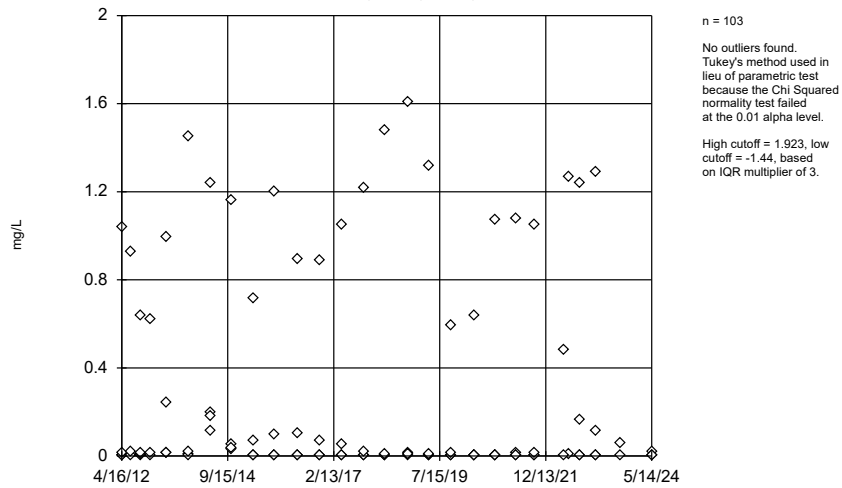
DW-15,DW-19,UW-11,UW-21



Constituent: Chromium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

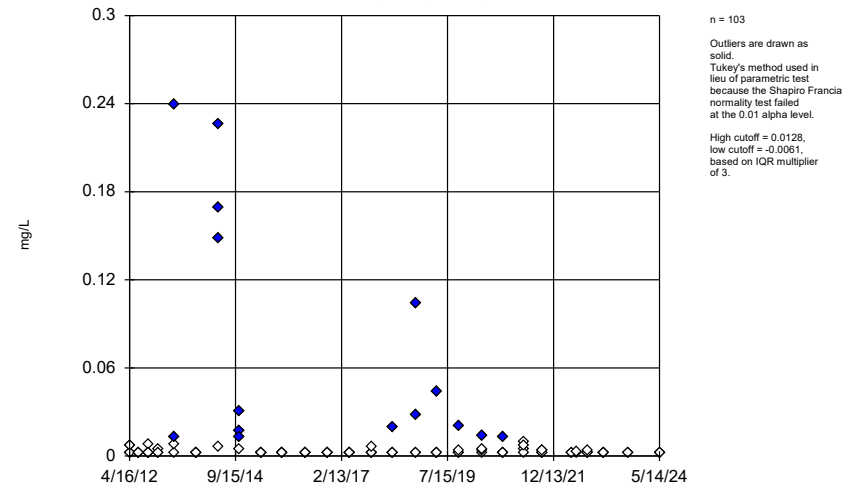
DW-15,DW-19,UW-11,UW-21



Constituent: Cobalt Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

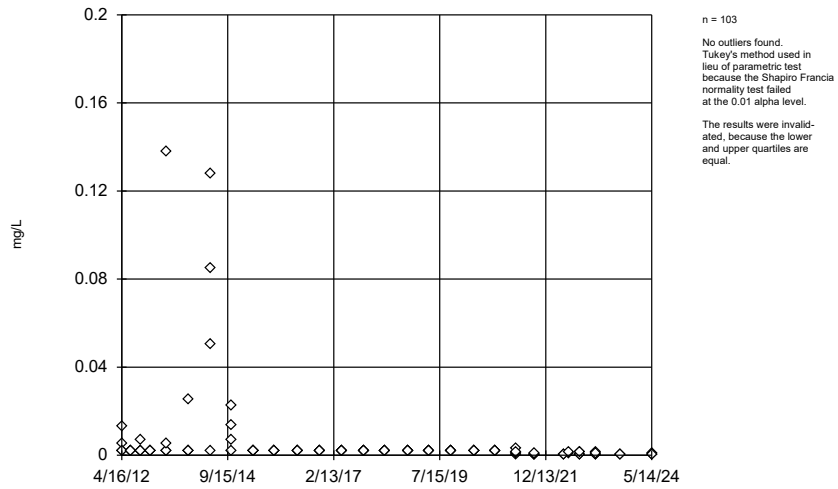
DW-15,DW-19,UW-11,UW-21



Constituent: Copper Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

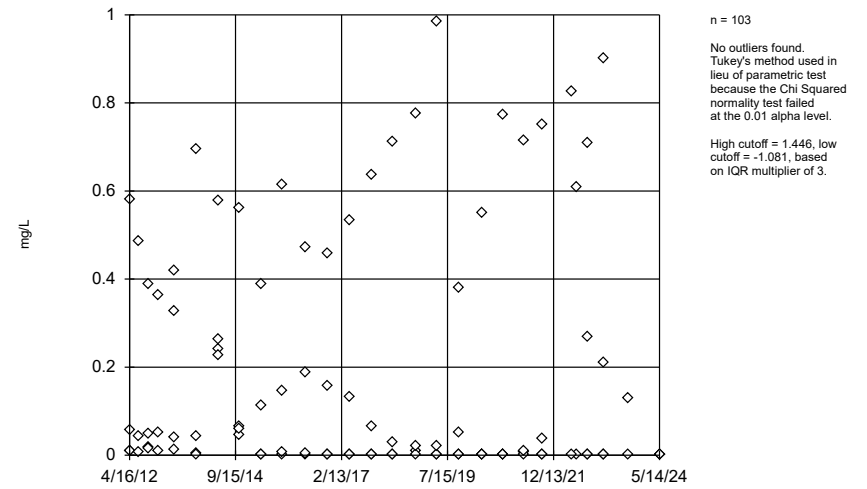
DW-15,DW-19,UW-11,UW-21



Constituent: Lead Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

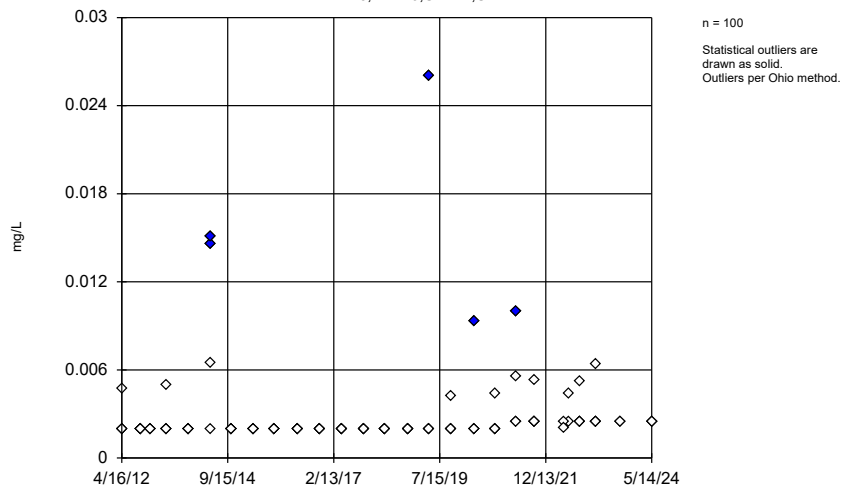
DW-15,DW-19,UW-11,UW-21



Constituent: Nickel Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

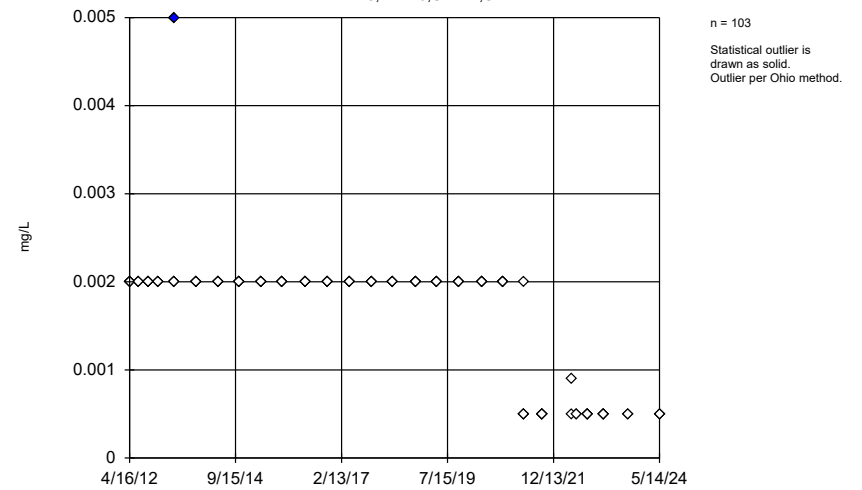
DW-15,DW-19,UW-11,UW-21



Constituent: Selenium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

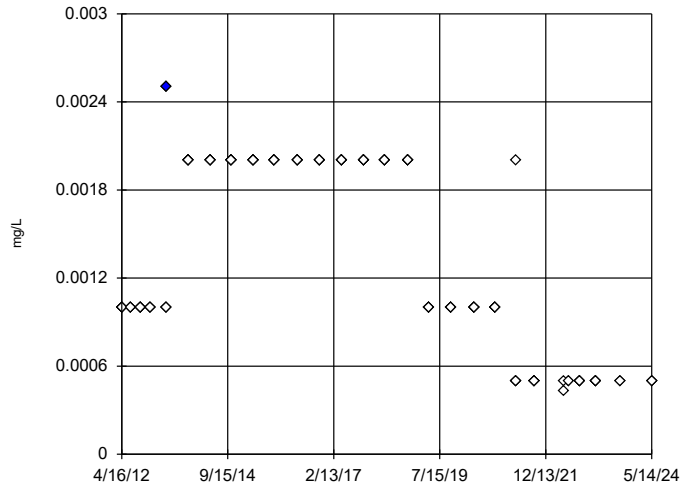
DW-15,DW-19,UW-11,UW-21



Constituent: Silver Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

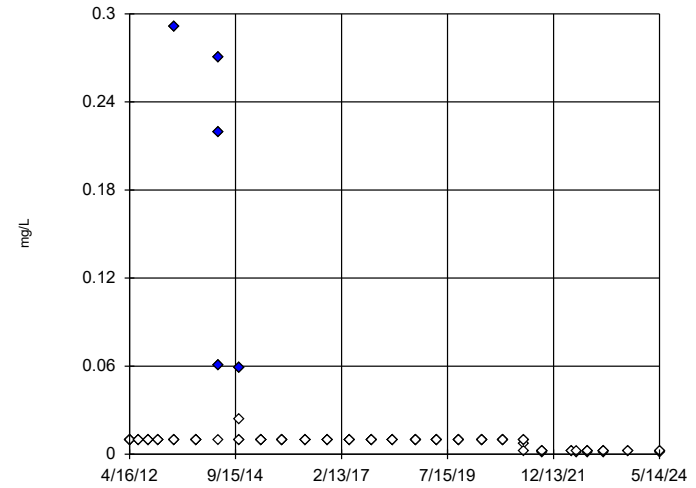


n = 103  
 Statistical outlier is drawn as solid.  
 Outlier per Ohio method.

Constituent: Thallium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
 Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

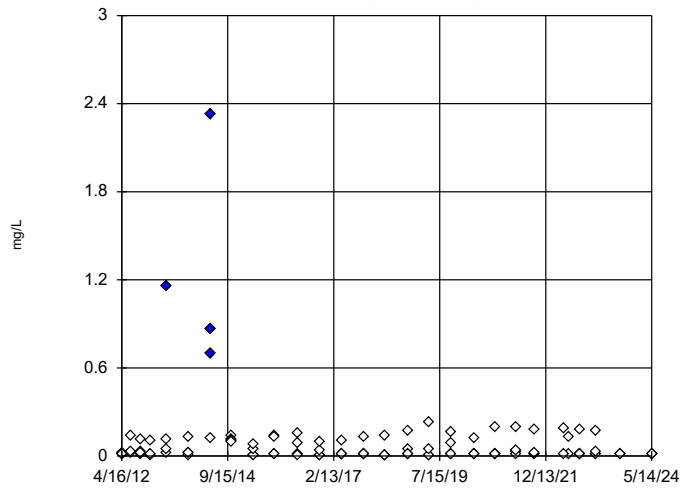


n = 103  
 Statistical outliers are drawn as solid.  
 Outliers per Ohio method.

Constituent: Vanadium Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
 Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21



n = 103  
 Outliers are drawn as solid.  
 Tukey's method used in lieu of parametric test because the Chi Squared normality test failed at the 0.01 alpha level.  
 High cutoff = 0.422, low cutoff = -0.299, based on IQR multiplier of 3.

Constituent: Zinc Analysis Run 8/23/2024 10:50 PM View: 2024SSN Outliers  
 Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active



## **Interwell Prediction Limit Summary Table and Graphs**

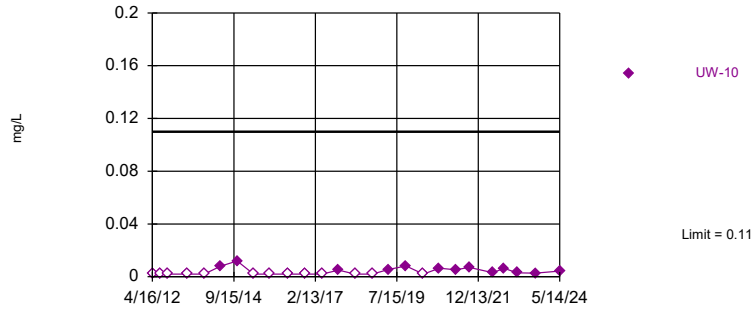
# Prediction Limit

Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active Printed 8/23/2024, 11:08 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Arsenic (mg/L)	UW-10	0.11	n/a	5/14/2024	0.00425	No	103	UW-11,DW-15,DW-19,UW-21	n/a	n/a	69.9	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Barium (mg/L)	DW-8	1.82	n/a	5/14/2024	0.0546	No	103	UW-21,UW-11,DW-19,DW-15	n/a	n/a	0	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Barium (mg/L)	DW-23	1.82	n/a	5/14/2024	0.0104	No	103	UW-21,UW-11,DW-19,DW-15	n/a	n/a	0	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Barium (mg/L)	DW-24	1.82	n/a	5/14/2024	0.00966	No	103	UW-21,UW-11,DW-19,DW-15	n/a	n/a	0	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Barium (mg/L)	PZ-14	1.82	n/a	5/14/2024	0.0252	No	103	UW-21,UW-11,DW-19,DW-15	n/a	n/a	0	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Barium (mg/L)	UW-10	1.82	n/a	5/14/2024	0.0174	No	103	UW-21,UW-11,DW-19,DW-15	n/a	n/a	0	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Beryllium (mg/L)	DW-23	0.0138	n/a	5/14/2024	0.00176	No	103	DW-15,UW-11,DW-19,UW-21	n/a	n/a	90.29	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Beryllium (mg/L)	DW-24	0.0138	n/a	5/14/2024	0.00705	No	103	DW-15,UW-11,DW-19,UW-21	n/a	n/a	90.29	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	DW-23	0.0109	n/a	5/14/2024	0.00332	No	103	DW-19,UW-11,DW-15,UW-21	n/a	n/a	66.99	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	DW-24	0.0109	n/a	5/14/2024	0.00913	No	103	DW-19,UW-11,DW-15,UW-21	n/a	n/a	66.99	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Cobalt (mg/L)	DW-8	1.61	n/a	5/14/2024	0.0092	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	18.45	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Cobalt (mg/L)	DW-23	1.61	n/a	5/14/2024	0.833	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	18.45	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Cobalt (mg/L)	DW-24	1.61	n/a	5/14/2024	0.2505	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	18.45	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Cobalt (mg/L)	PZ-14	1.61	n/a	5/14/2024	0.005	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	18.45	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Cobalt (mg/L)	UW-10	1.61	n/a	5/14/2024	0.0827	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	18.45	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Copper (mg/L)	DW-24	0.239	n/a	5/14/2024	0.009825	No	103	DW-15,DW-19,UW-11,UW-21	n/a	n/a	66.99	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
Lead (mg/L)	DW-23	0.138	n/a	5/14/2024	0.000567	No	103	UW-11,DW-19,DW-15,UW-21	n/a	n/a	73.79	n/a	n/a	0.0001842	NP Inter (NDs) 1 of 2
<b>Nickel (mg/L)</b>	<b>DW-23</b>	<b>0.985</b>	<b>n/a</b>	<b>5/14/2024</b>	<b>1.16</b>	<b>Yes</b>	<b>103</b>	<b>DW-19,DW-15,UW-11,UW-21</b>	<b>n/a</b>	<b>n/a</b>	<b>30.1</b>	<b>n/a</b>	<b>n/a</b>	<b>0.0001842</b>	<b>NP Inter (normality) 1 of 2</b>
Nickel (mg/L)	DW-24	0.985	n/a	5/14/2024	0.2255	No	103	DW-19,DW-15,UW-11,UW-21	n/a	n/a	30.1	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Nickel (mg/L)	PZ-14	0.985	n/a	5/14/2024	0.0067	No	103	DW-19,DW-15,UW-11,UW-21	n/a	n/a	30.1	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Selenium (mg/L)	DW-23	0.026	n/a	5/14/2024	0.0054	No	100	DW-15,DW-19,UW-21,UW-11	n/a	n/a	86	n/a	n/a	0.0001929	NP Inter (NDs) 1 of 2
Selenium (mg/L)	DW-24	0.026	n/a	5/14/2024	0.004905J	No	100	DW-15,DW-19,UW-21,UW-11	n/a	n/a	86	n/a	n/a	0.0001929	NP Inter (NDs) 1 of 2
Zinc (mg/L)	DW-23	2.33	n/a	5/14/2024	0.585	No	103	DW-19,DW-15,UW-11,UW-21	n/a	n/a	40.78	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Zinc (mg/L)	DW-24	2.33	n/a	5/14/2024	0.3075	No	103	DW-19,DW-15,UW-11,UW-21	n/a	n/a	40.78	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2
Zinc (mg/L)	PZ-14	2.33	n/a	5/14/2024	0.0288	No	103	DW-19,DW-15,UW-11,UW-21	n/a	n/a	40.78	n/a	n/a	0.0001842	NP Inter (normality) 1 of 2

Within Limit

Prediction Limit  
Interwell Non-parametric

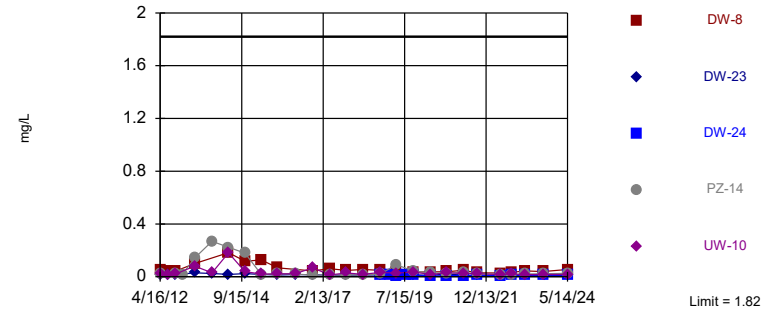


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 103 background values. 69.9% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Assumes 6 future values.

Constituent: Arsenic Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

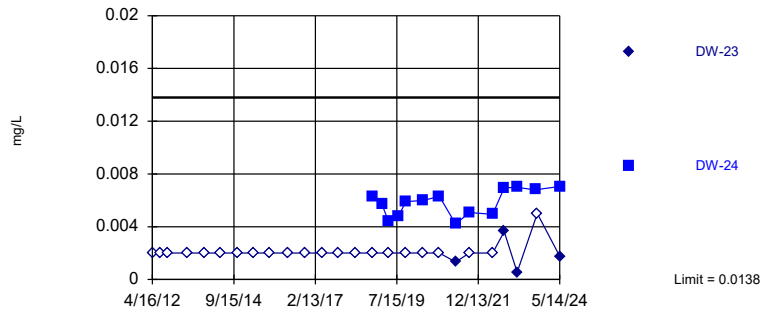


Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 103 background values. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 5 points to limit. Assumes 2 future values.

Constituent: Barium Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

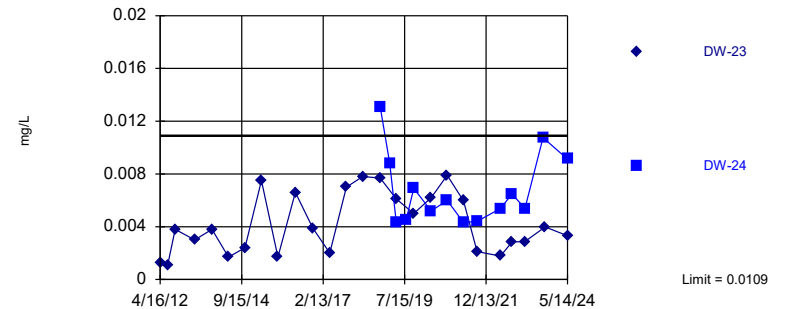


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 103 background values. 90.29% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 2 points to limit. Assumes 5 future values.

Constituent: Beryllium Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

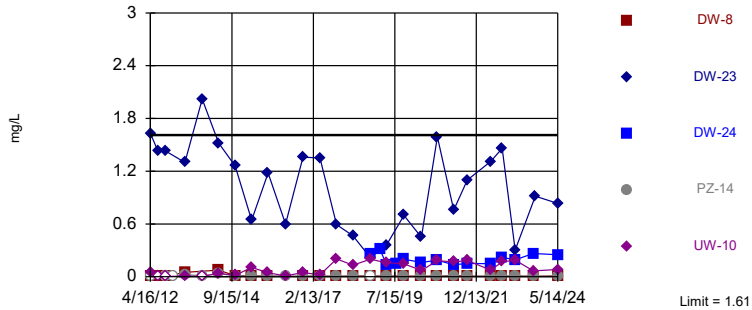


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 103 background values. 66.99% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 2 points to limit. Assumes 5 future values.

Constituent: Cadmium Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

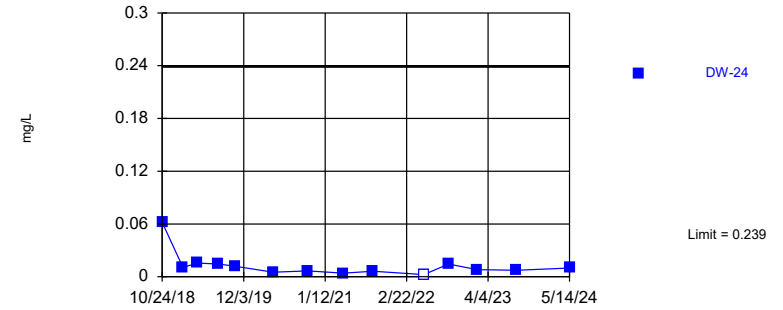


Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 103 background values. 18.45% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 5 points to limit. Assumes 2 future values.

Constituent: Cobalt Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

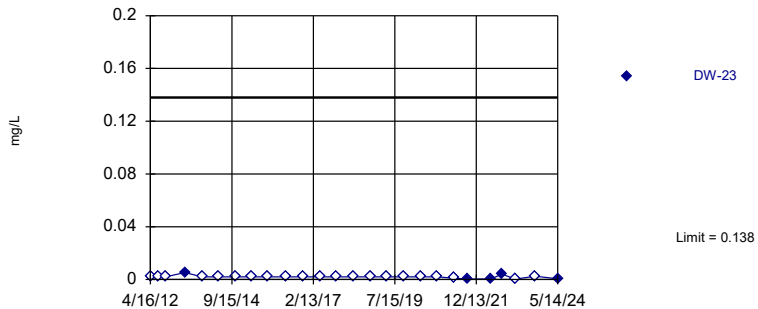


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 103 background values. 66.99% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Assumes 6 future values.

Constituent: Copper Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

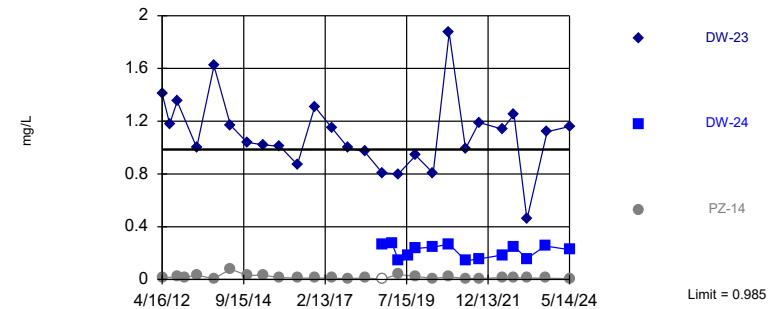


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 103 background values. 73.79% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Assumes 6 future values.

Constituent: Lead Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Exceeds Limit: DW-23

Prediction Limit  
Interwell Non-parametric

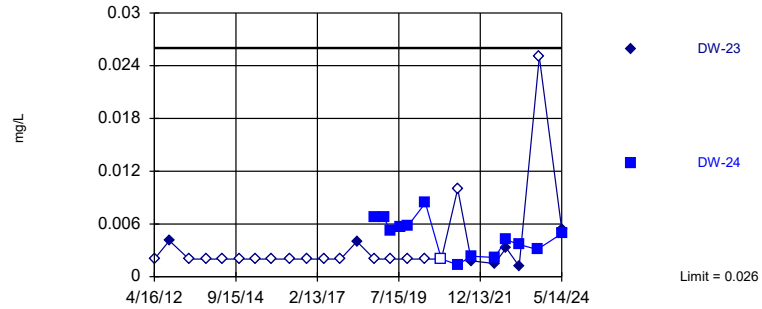


Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 103 background values. 30.1% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 3 points to limit. Assumes 4 future values.

Constituent: Nickel Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

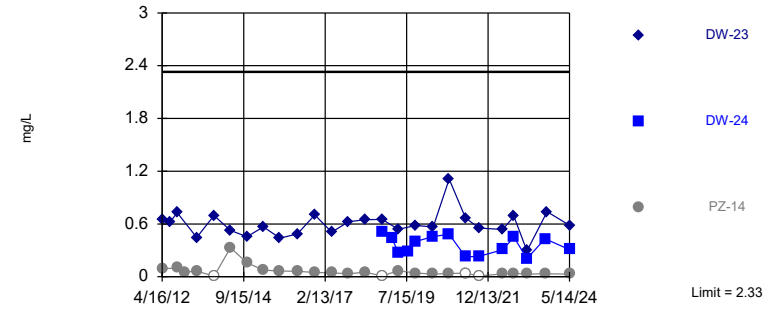


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 100 background values. 86% NDs. Annual per-constituent alpha = 0.002698. Individual comparison alpha = 0.0001929 (1 of 2). Comparing 2 points to limit. Assumes 5 future values.

Constituent: Selenium Analysis Run 8/23/2024 11:06 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 103 background values. 40.78% NDs. Annual per-constituent alpha = 0.002576. Individual comparison alpha = 0.0001842 (1 of 2). Comparing 3 points to limit. Assumes 4 future values.

Constituent: Zinc Analysis Run 8/23/2024 11:07 PM View: 2024SSN DM and AM Prediction limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

## **Intrawell Prediction Limit Summary Table and Graphs**

# Intrawell Prediction Limit

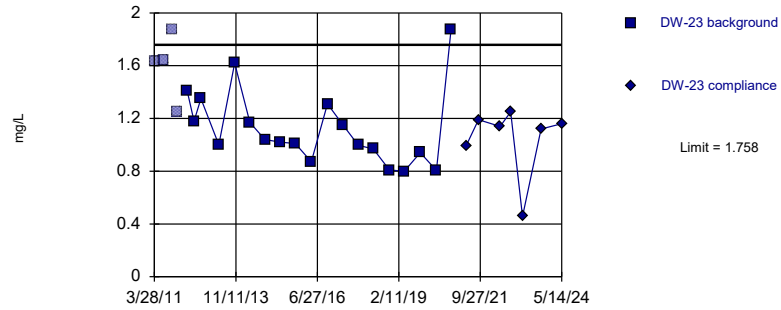
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active Printed 8/23/2024, 11:13 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Wells</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Nickel (mg/L)	DW-23	1.758	n/a	5/14/2024	1.16	No	19	n/a	1.122	0.2854	0	None	No	0.0009403	Param 1 of 2

Within Limit

### Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.122, Std. Dev.=0.2854, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8928, critical = 0.863. Kappa = 2.229 (c=8, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.0009403.

Constituent: Nickel Analysis Run 8/23/2024 11:13 PM View: 2024SSN - IntraPL DW-23  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active



## **Mann-Kendall/Sen's Slope Trend Test Summary Table and Graphs**

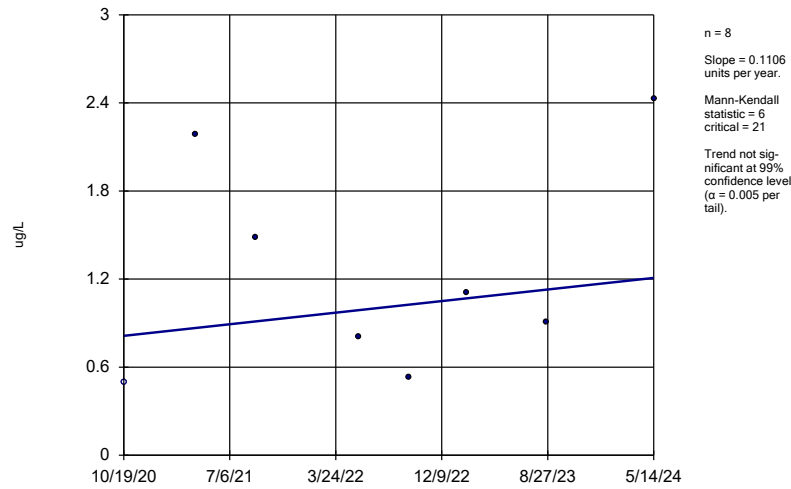
# Trend Test

Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN Printed 8/23/2024, 11:30 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Alpha</u>	<u>Method</u>
1,1-Dichloroethane (ug/L)	DW-8	0.1106	6	21	No	8	12.5	0.01	NP
1,4-Dichlorobenzene (ug/L)	UW-10	0.4544	10	21	No	8	0	0.01	NP
Benzene (ug/L)	UW-10	0.3356	11	21	No	8	12.5	0.01	NP
cis-1,2-Dichloroethene (ug/L)	DW-8	0.05421	3	21	No	8	25	0.01	NP
cis-1,2-Dichloroethene (ug/L)	UW-10	-0.2078	-20	-21	No	8	0	0.01	NP
Vinyl Chloride (ug/L)	UW-10	0.04422	11	21	No	8	25	0.01	NP

### Sen's Slope Estimator

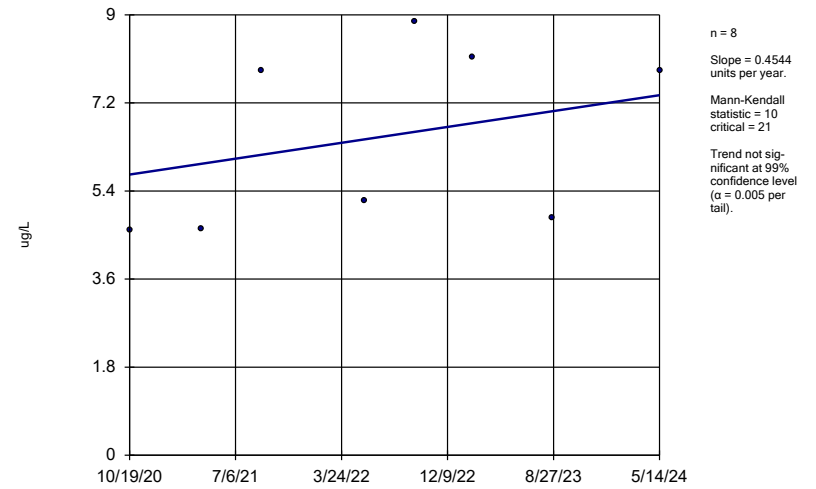
DW-8



Constituent: 1,1-Dichloroethane Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Sen's Slope Estimator

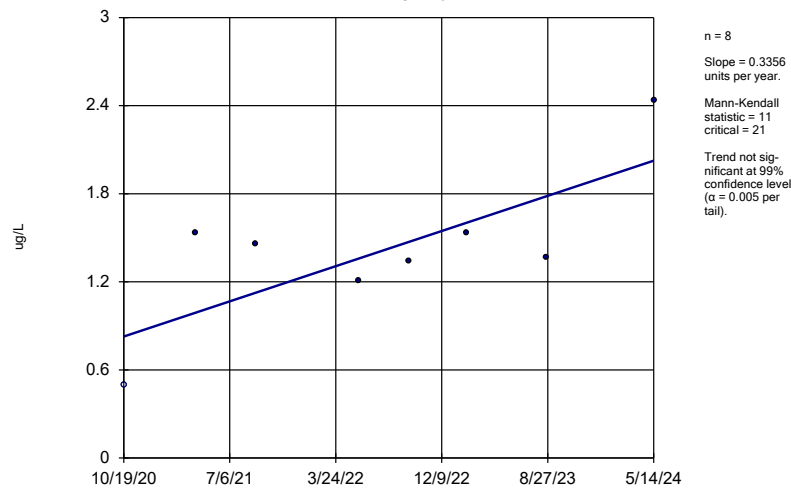
UW-10



Constituent: 1,4-Dichlorobenzene Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Sen's Slope Estimator

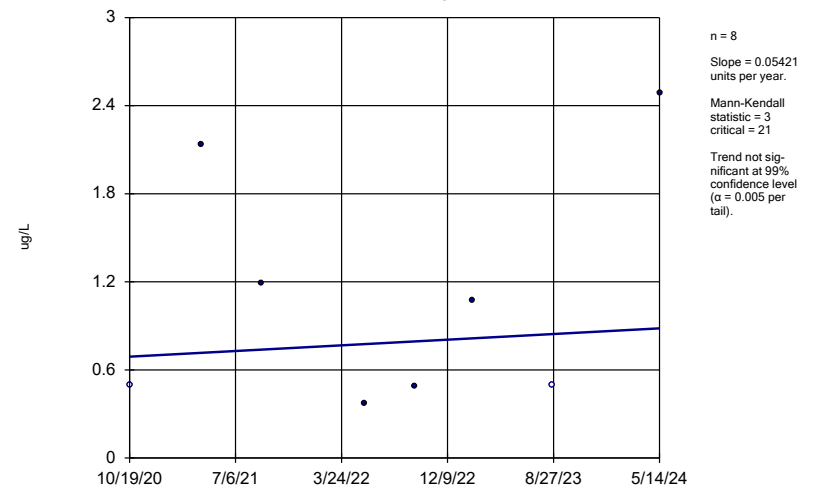
UW-10



Constituent: Benzene Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Sen's Slope Estimator

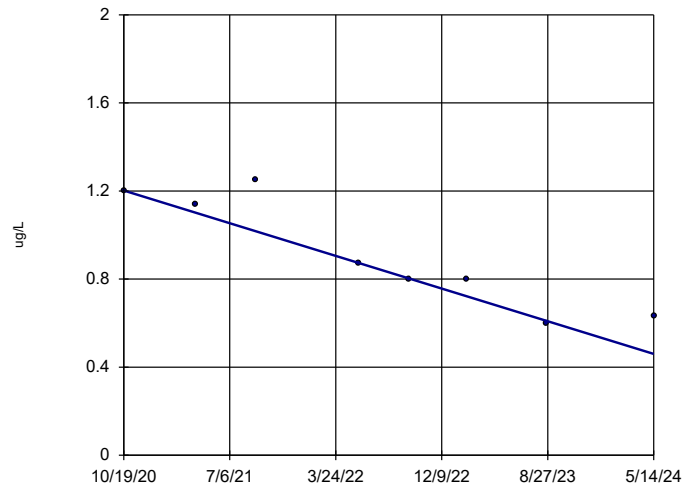
DW-8



Constituent: cis-1,2-Dichloroethene Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Sen's Slope Estimator

UW-10

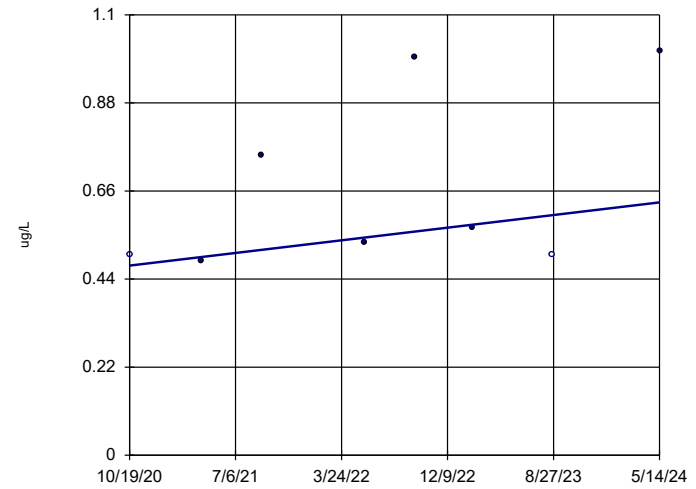


n = 8  
Slope = -0.2078  
units per year.  
Mann-Kendall  
statistic = -20  
critical = -21  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: cis-1,2-Dichloroethene Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Sen's Slope Estimator

UW-10



n = 8  
Slope = 0.04422  
units per year.  
Mann-Kendall  
statistic = 11  
critical = 21  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Vinyl Chloride Analysis Run 8/23/2024 11:28 PM View: 2024SSN Mann Kendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

## **Confidence Interval Summary Table and Graphs**

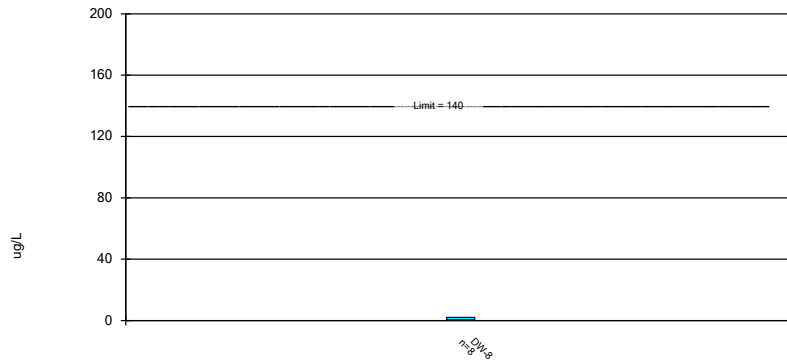
# Confidence Interval

Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN Printed 8/23/2024, 11:34 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
1,1-Dichloroethane (ug/L)	DW-8	2.017	0.4691	140	No	8	12.5	No	0.01	Param.
1,4-Dichlorobenzene (ug/L)	UW-10	8.438	4.56	75	No	8	0	No	0.01	Param.
Benzene (ug/L)	UW-10	1.984	0.8608	5	No	8	12.5	No	0.01	Param.
cis-1,2-Dichloroethene (ug/L)	DW-8	1.898	0.256	70	No	8	25	No	0.01	Param.
cis-1,2-Dichloroethene (ug/L)	UW-10	1.181	0.6425	70	No	8	0	No	0.01	Param.
Vinyl Chloride (ug/L)	UW-10	0.9297	0.4886	2	No	8	25	No	0.01	Param.

### Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: 1,1-Dichloroethane Analysis Run 8/23/2024 11:32 PM View: 2024SSN Confidence Interval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Parametric Confidence Interval

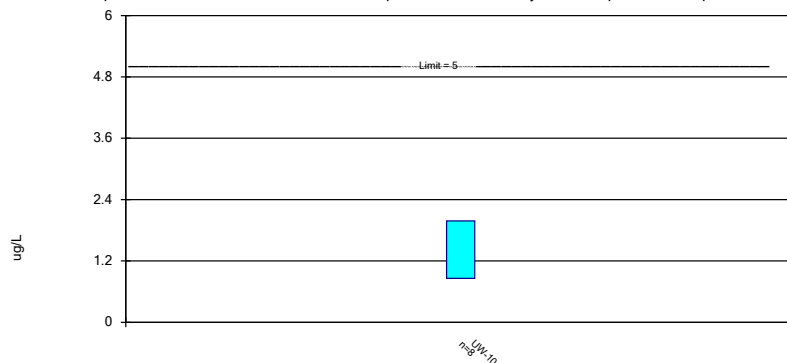
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: 1,4-Dichlorobenzene Analysis Run 8/23/2024 11:32 PM View: 2024SSN Confidence Interval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Parametric Confidence Interval

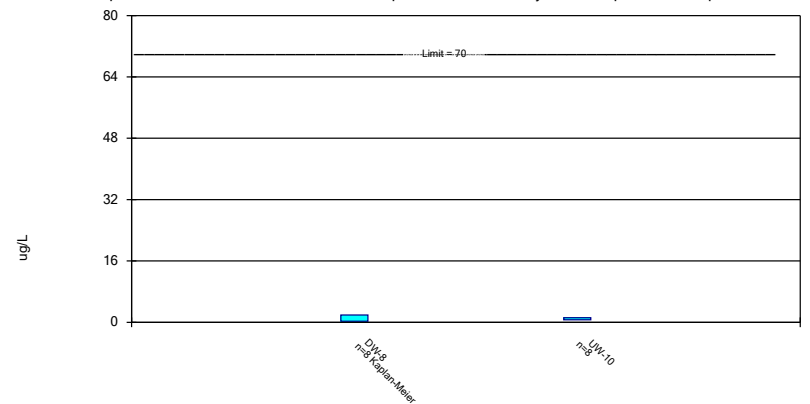
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Benzene Analysis Run 8/23/2024 11:32 PM View: 2024SSN Confidence Interval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Parametric Confidence Interval

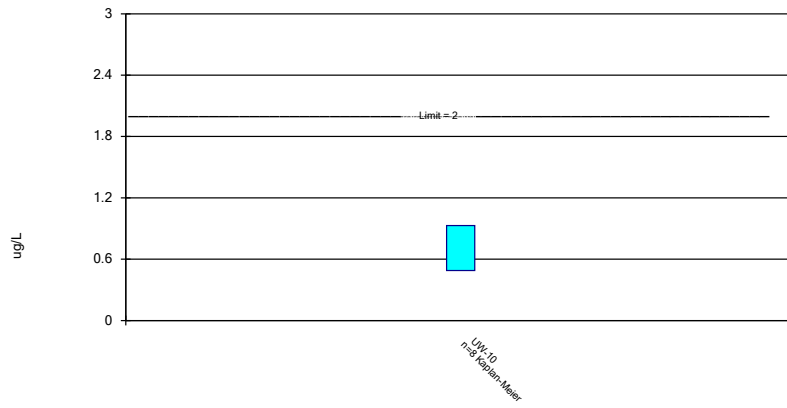
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: cis-1,2-Dichloroethene Analysis Run 8/23/2024 11:32 PM View: 2024SSN Confidence Interval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN

### Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



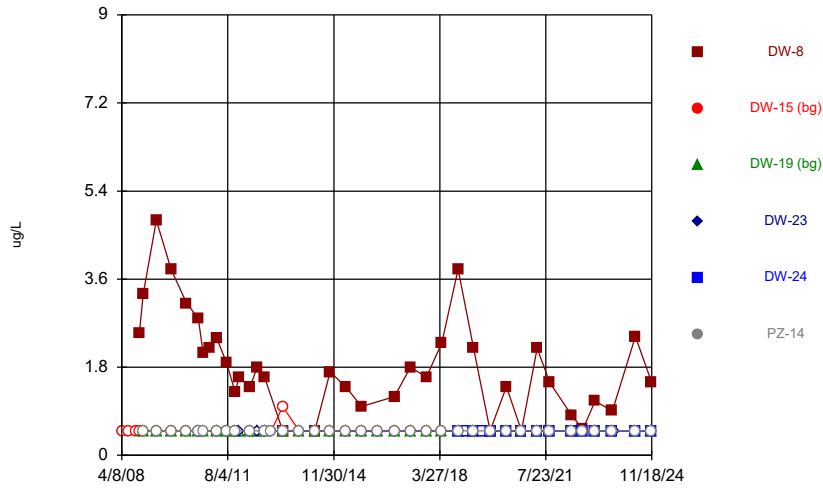
Constituent: Vinyl Chloride Analysis Run 8/23/2024 11:33 PM View: 2024SSN Confidence Interval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-AM 2024SSN



**Attachment B**  
**2<sup>nd</sup> 2024 Statistical Evaluation Output**

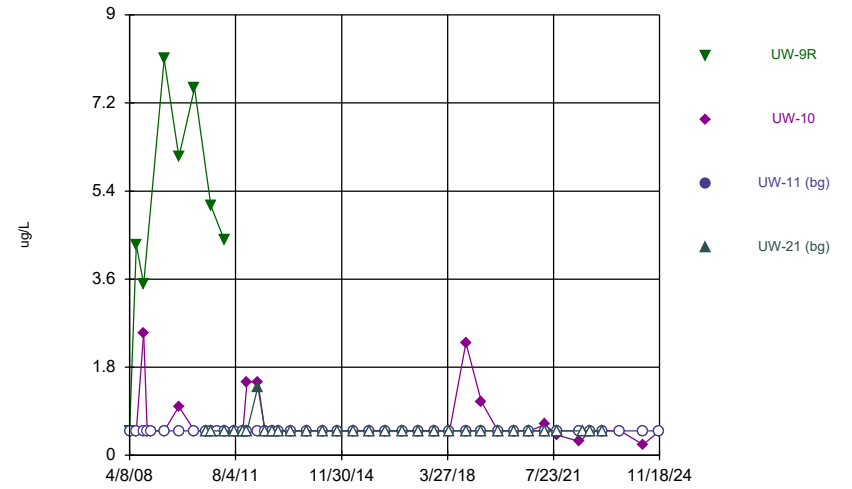
## **Time Series Plots**

### Time Series



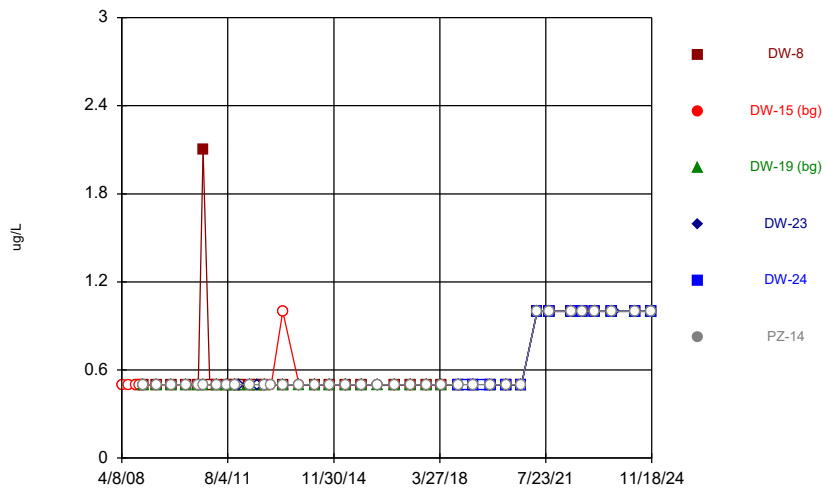
Constituent: 1,1-Dichloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



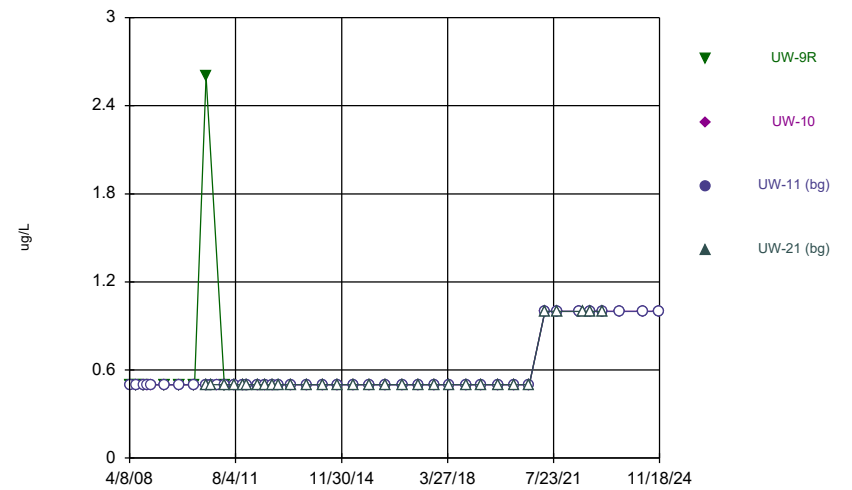
Constituent: 1,1-Dichloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



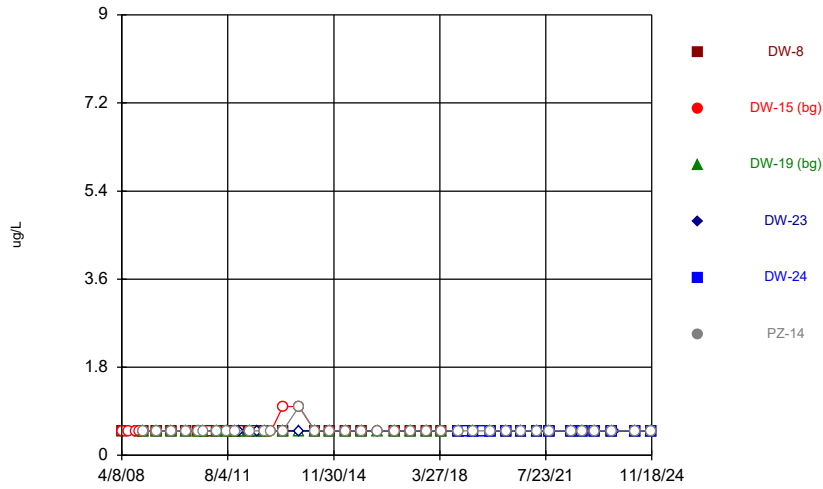
Constituent: 1,1-Dichloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



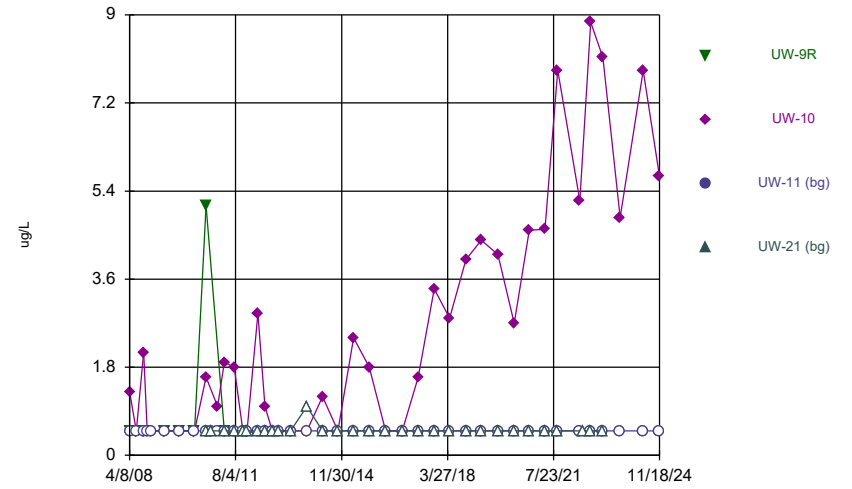
Constituent: 1,1-Dichloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



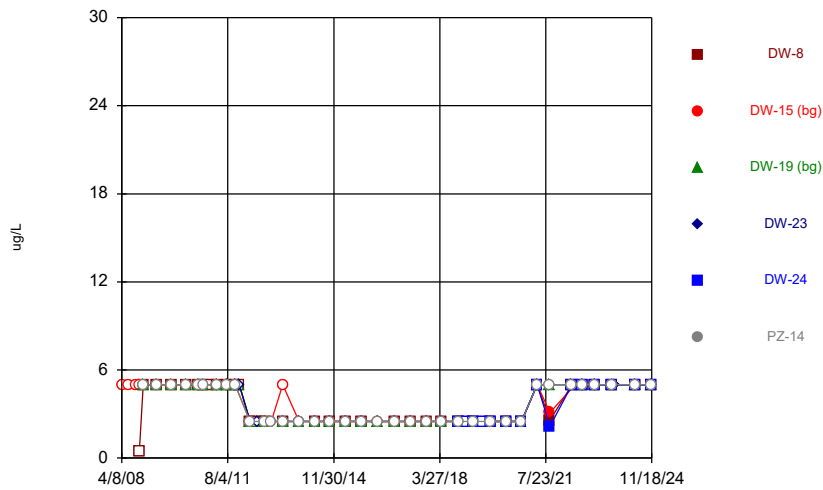
Constituent: 1,4-Dichlorobenzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



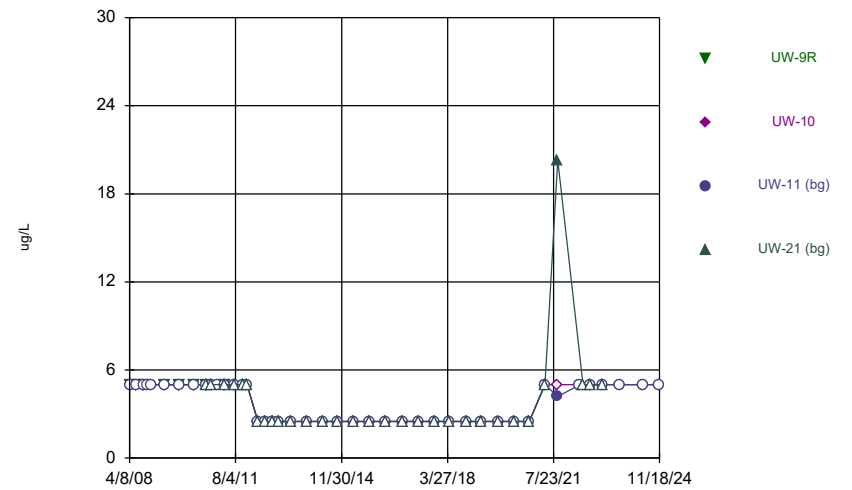
Constituent: 1,4-Dichlorobenzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



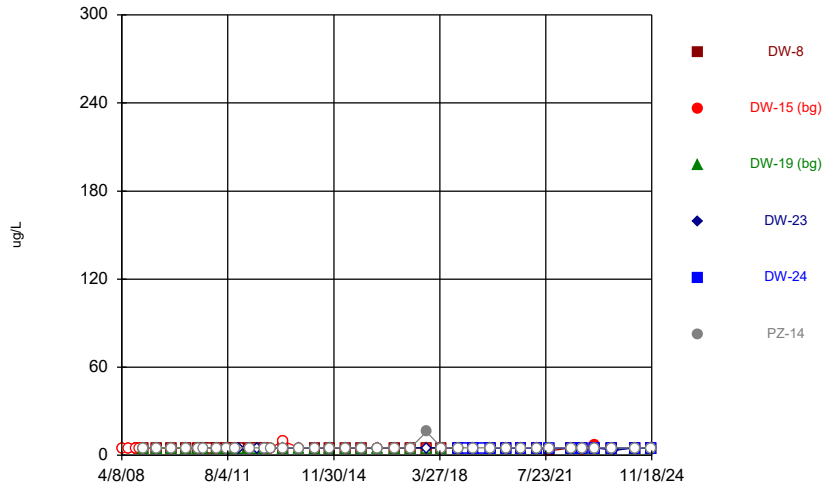
Constituent: 2-Butanone Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



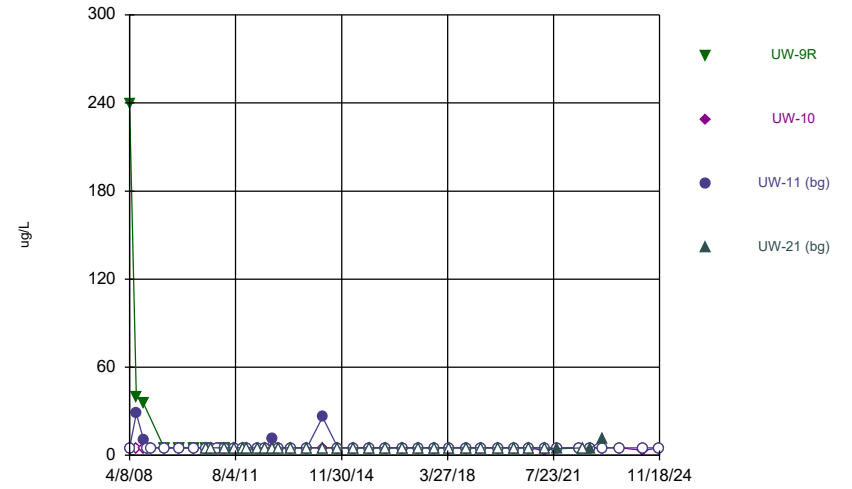
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



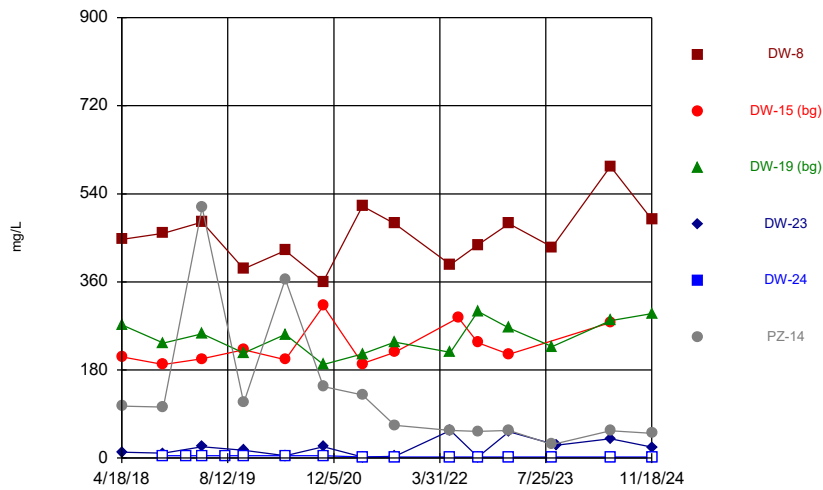
Constituent: Acetone Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



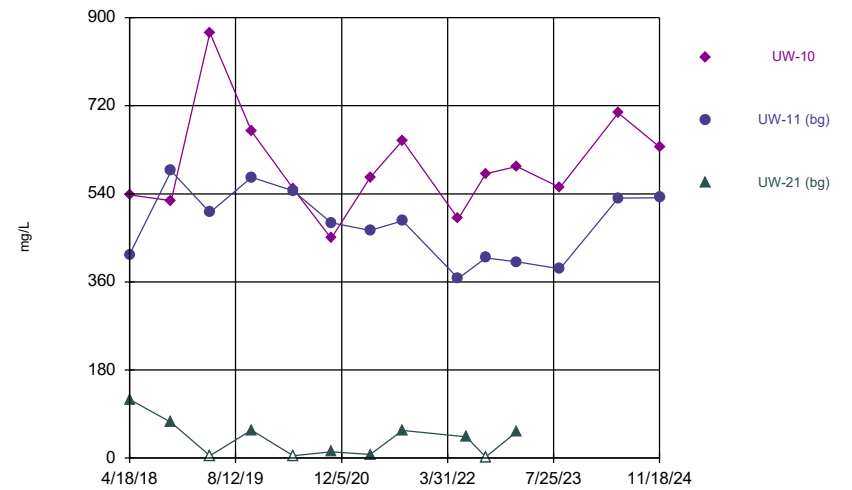
Constituent: Acetone Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



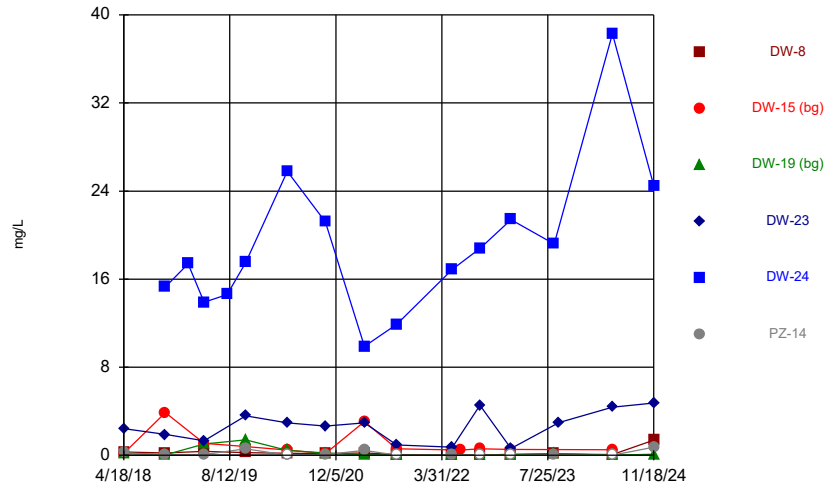
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



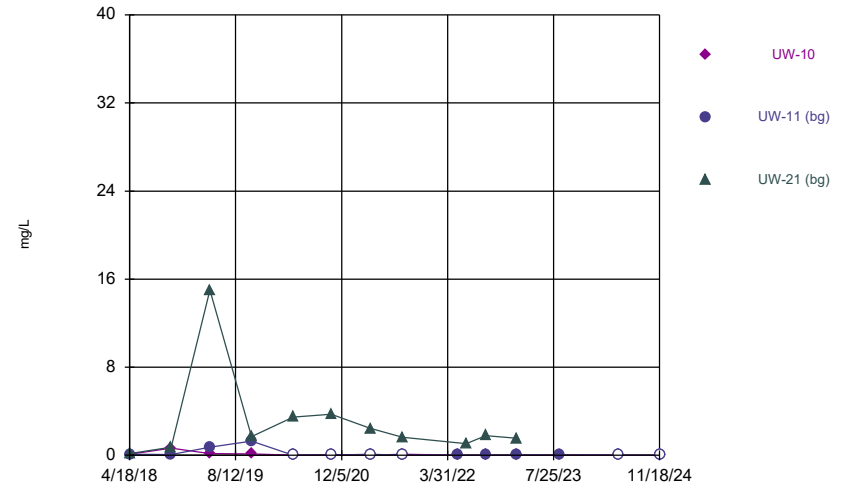
Constituent: Alkalinity, Total [CaCO3] Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



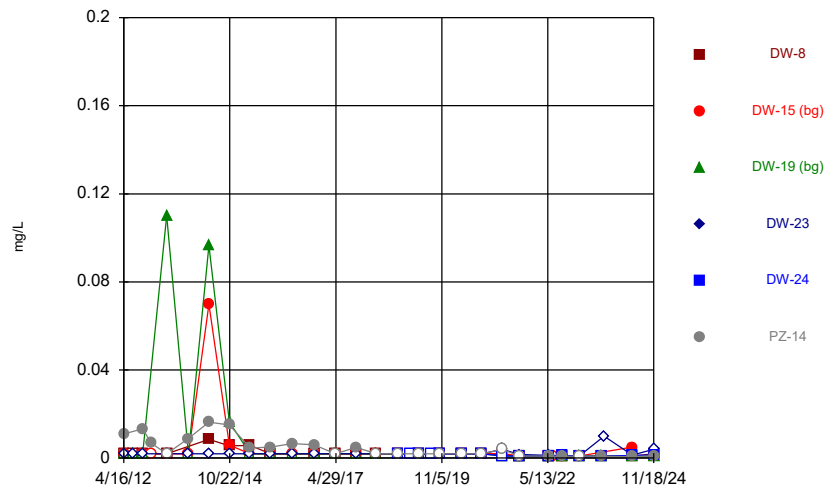
Constituent: Aluminum Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



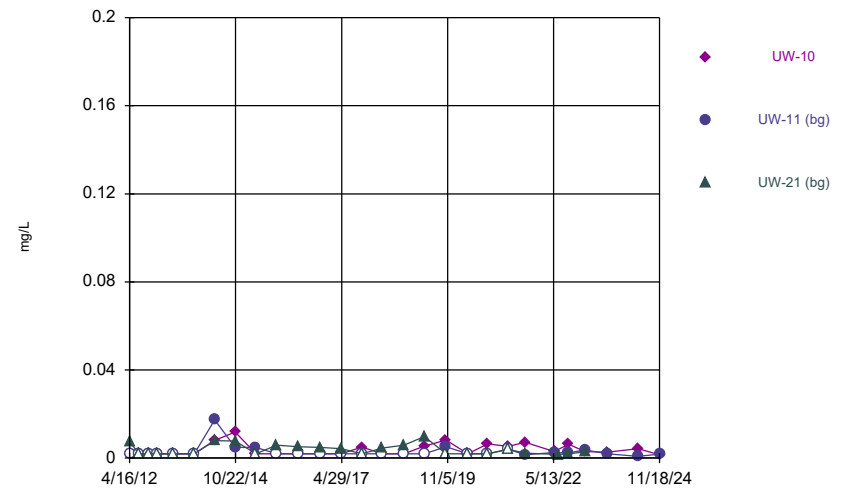
Constituent: Aluminum Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



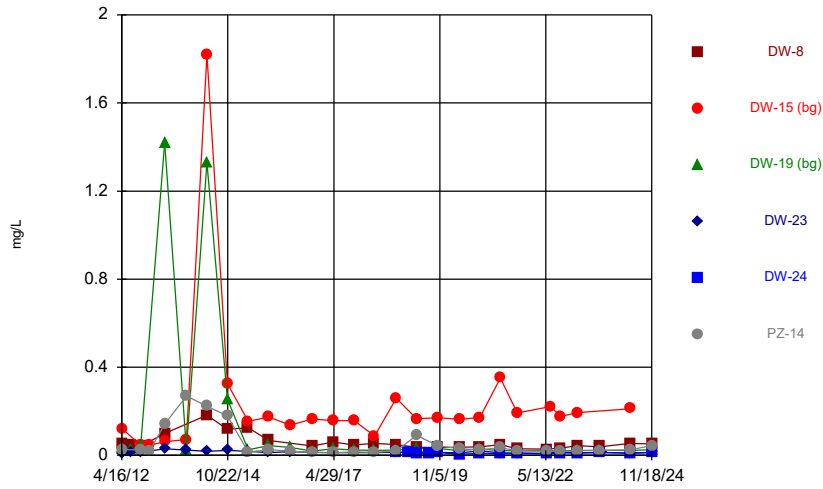
Constituent: Arsenic Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



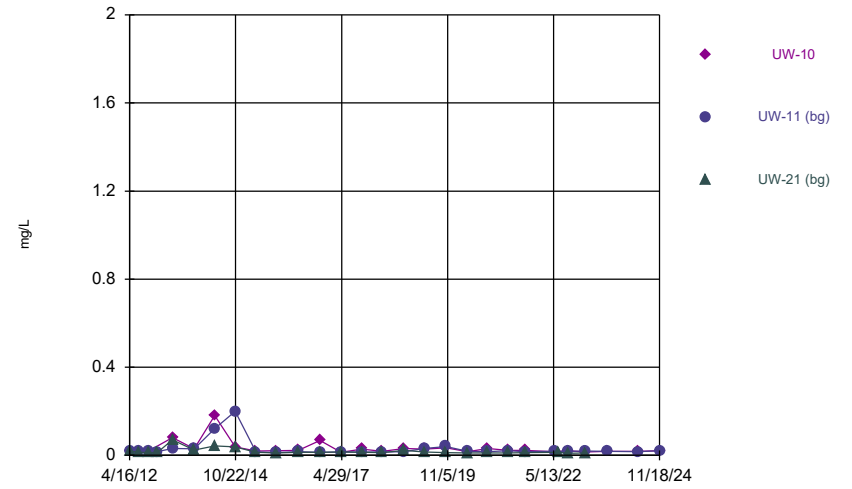
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



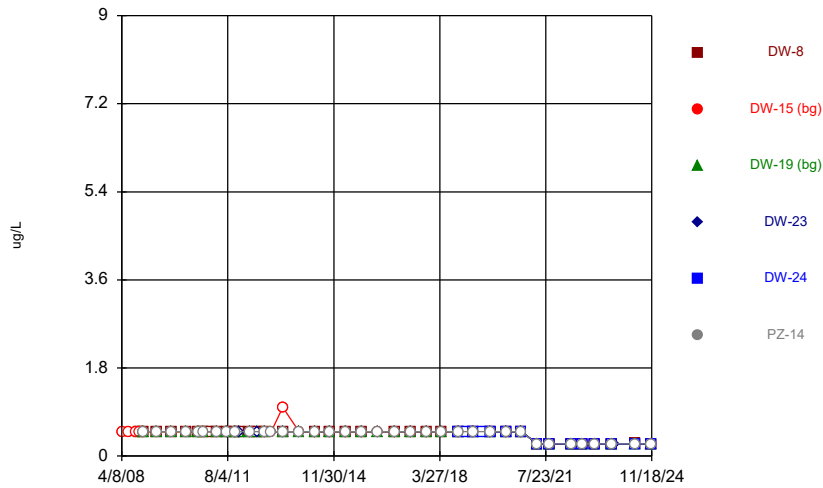
Constituent: Barium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



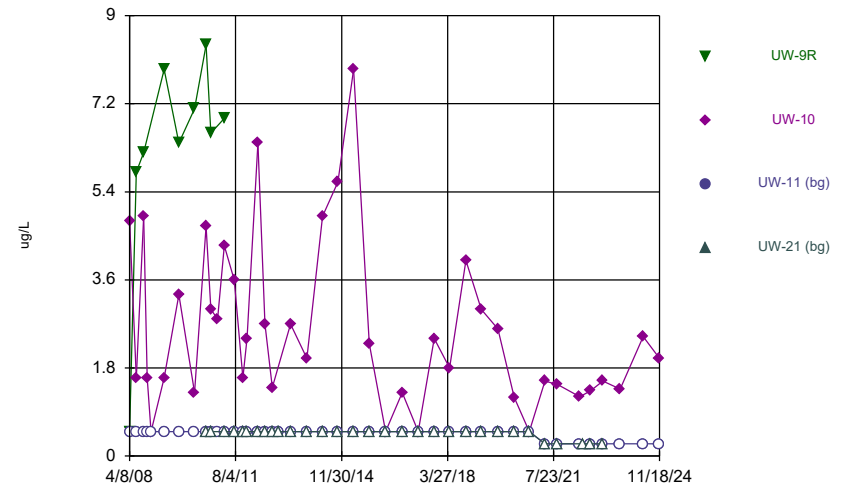
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



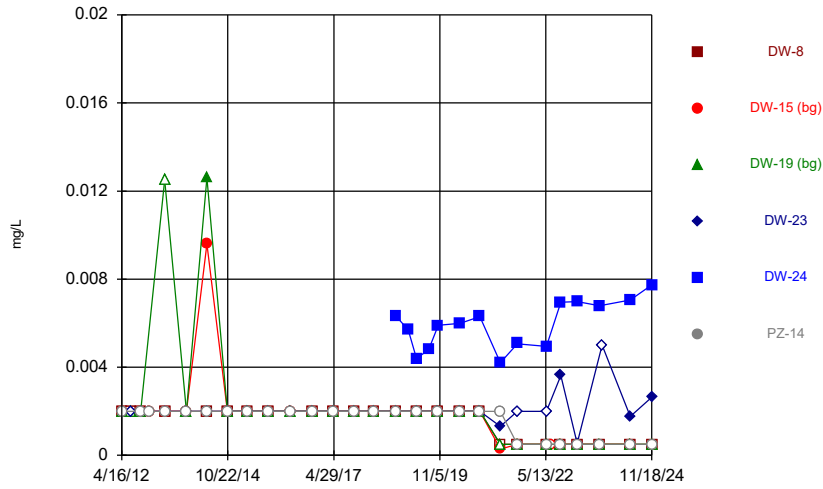
Constituent: Benzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



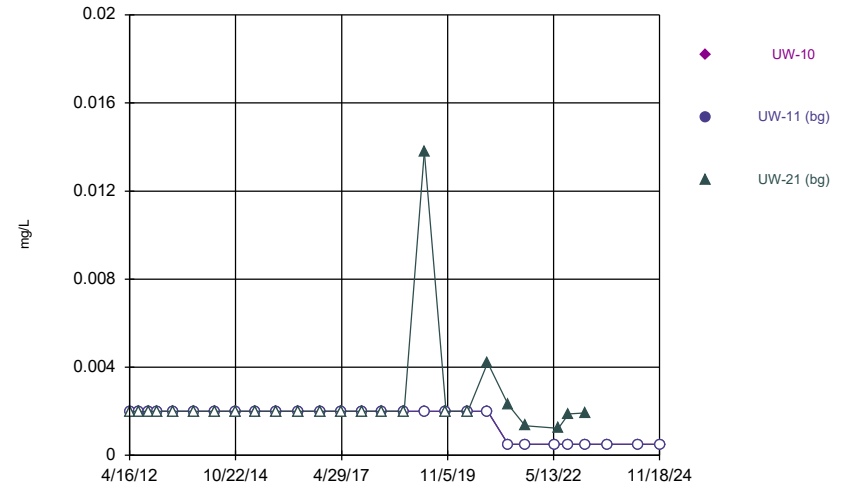
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



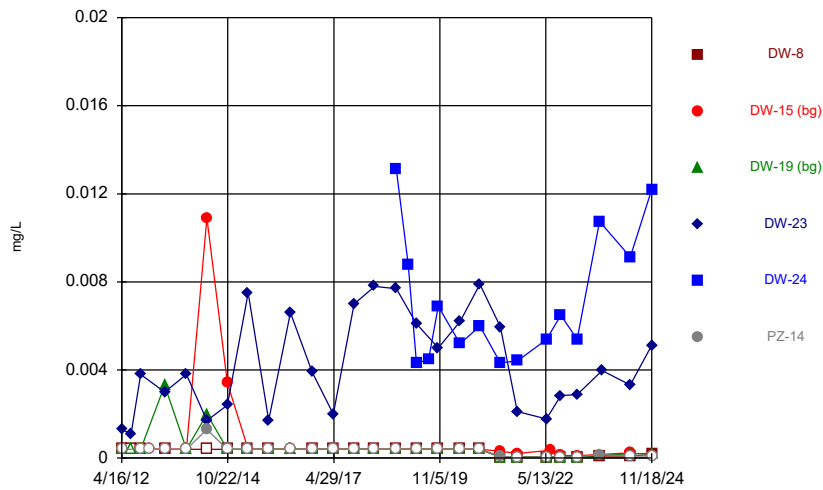
Constituent: Beryllium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



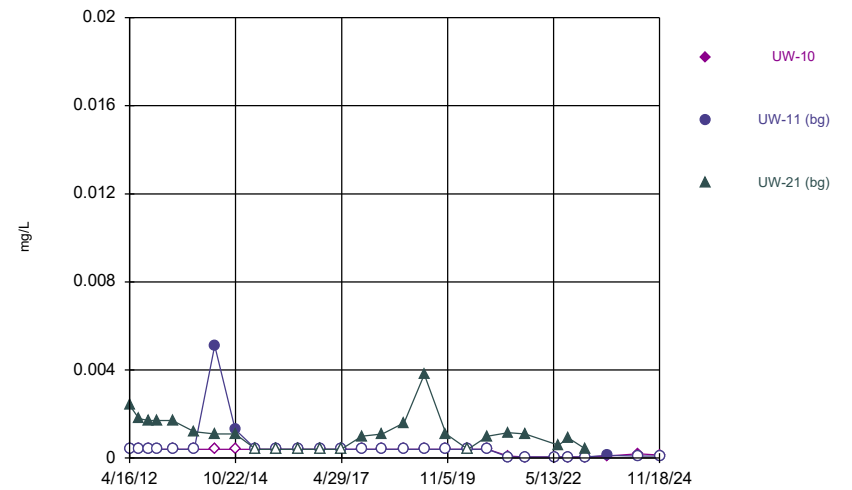
Constituent: Beryllium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Cadmium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

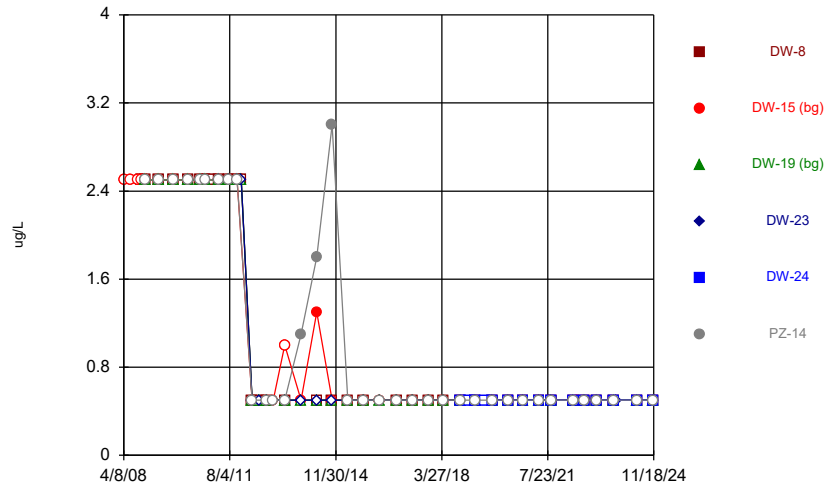
### Time Series



Constituent: Cadmium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

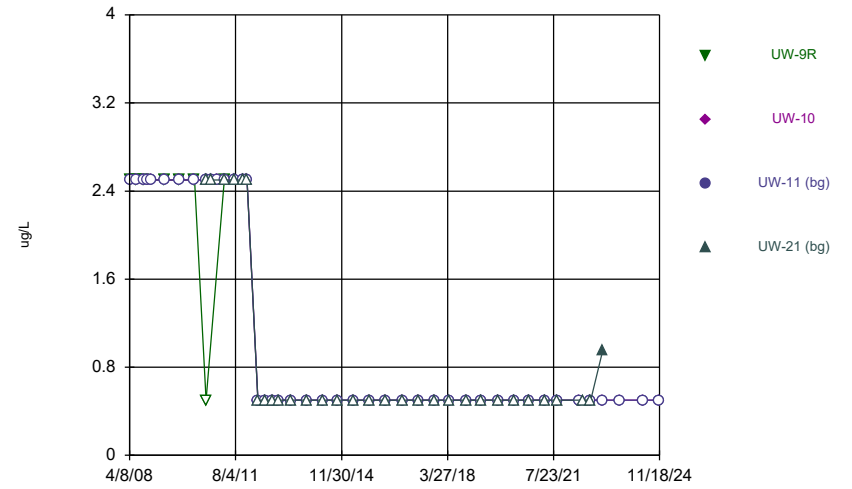


### Time Series



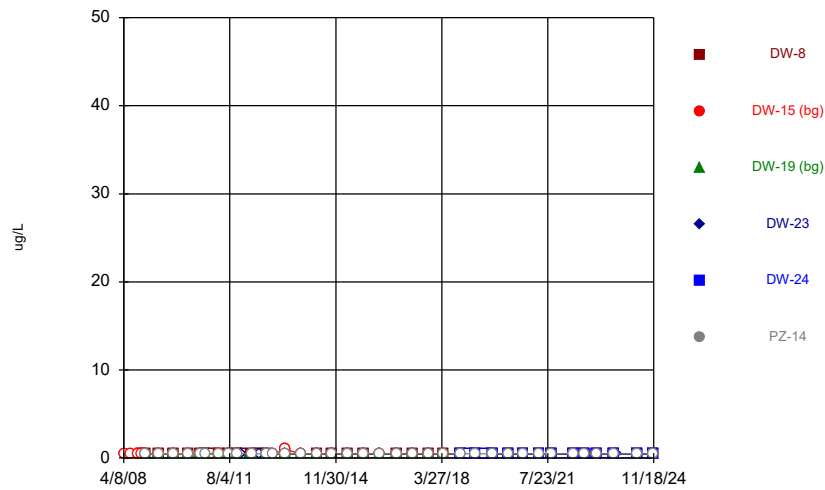
Constituent: Carbon Disulfide Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



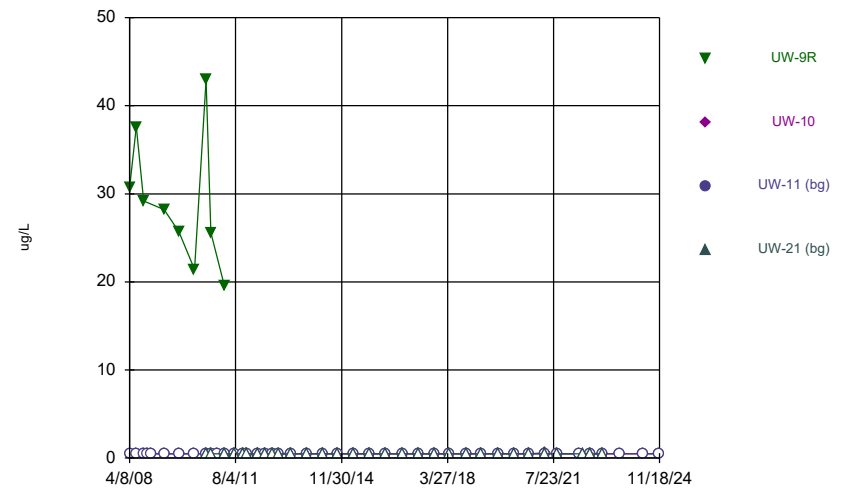
Constituent: Carbon Disulfide Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



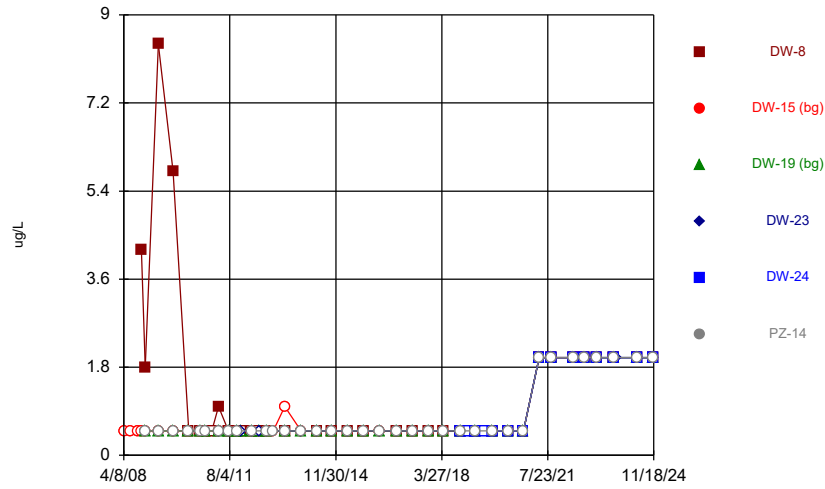
Constituent: Chlorobenzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



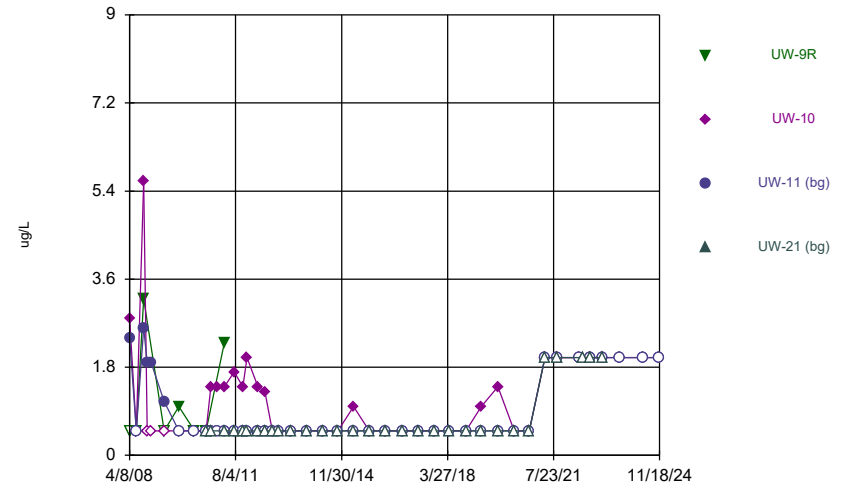
Constituent: Chlorobenzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



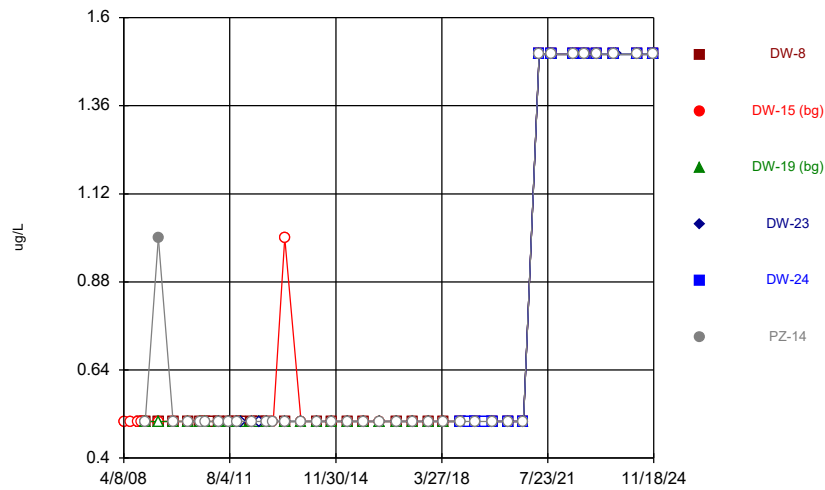
Constituent: Chloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



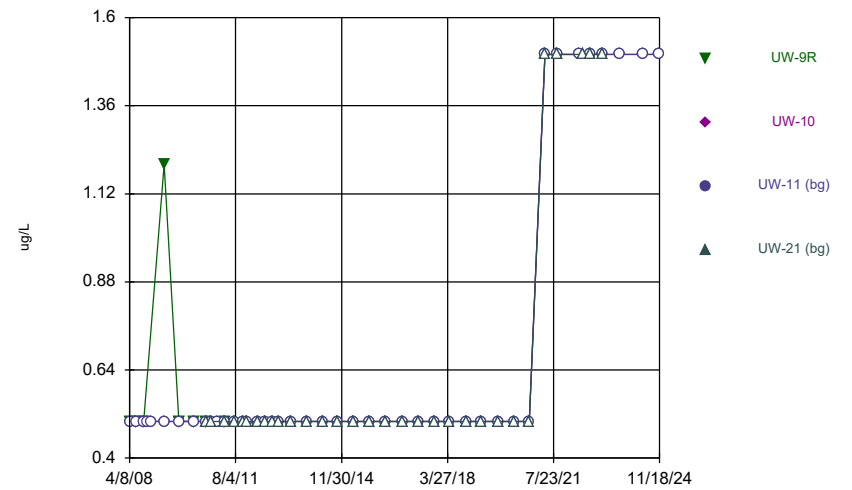
Constituent: Chloroethane Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



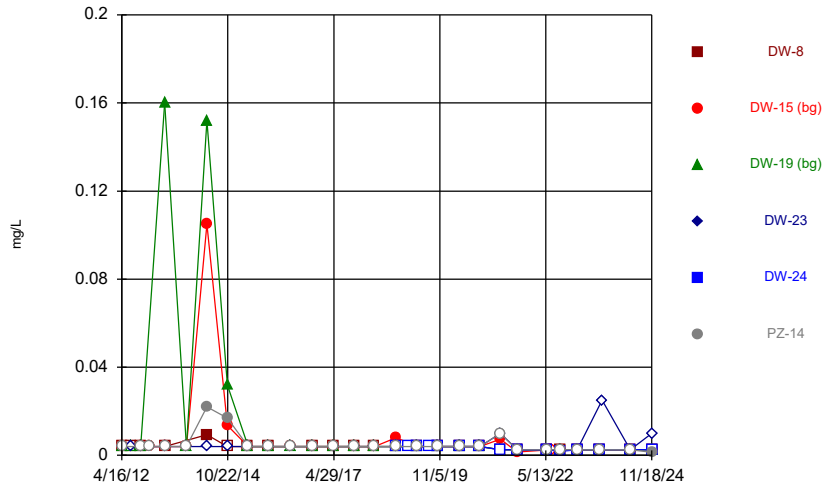
Constituent: Chloroform Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



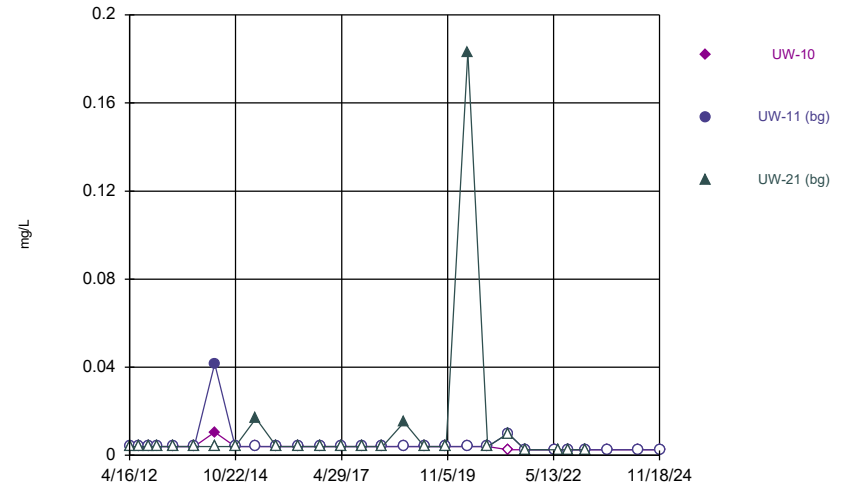
Constituent: Chloroform Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



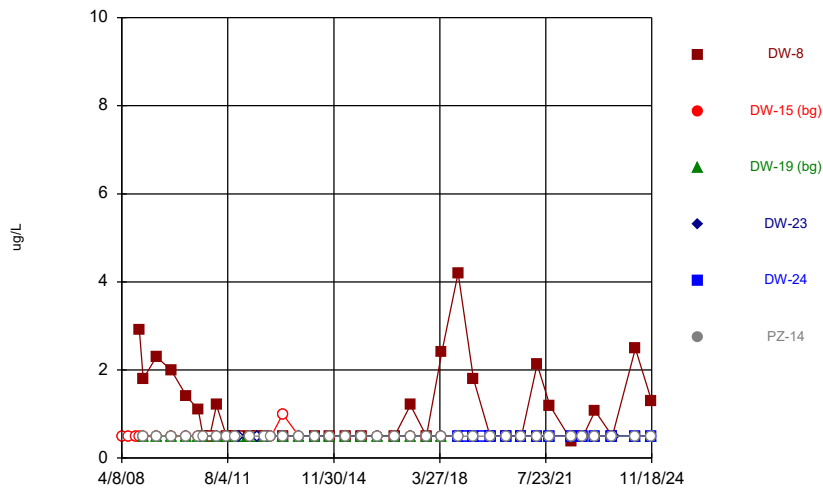
Constituent: Chromium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



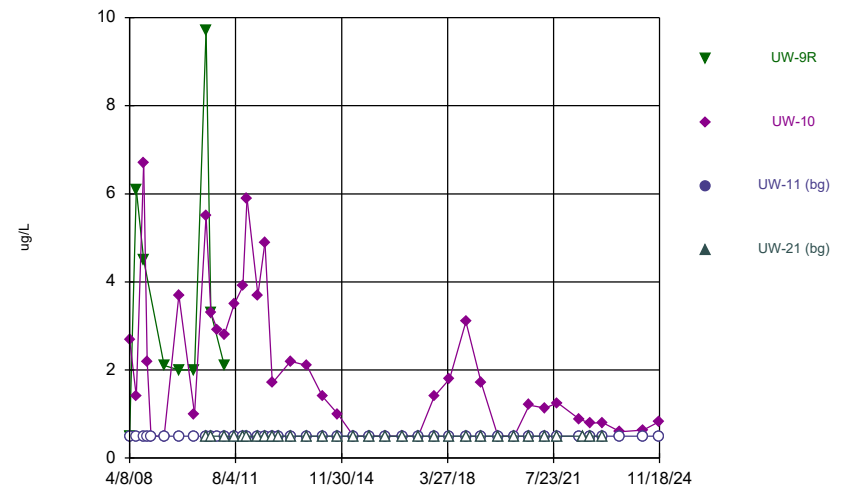
Constituent: Chromium Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



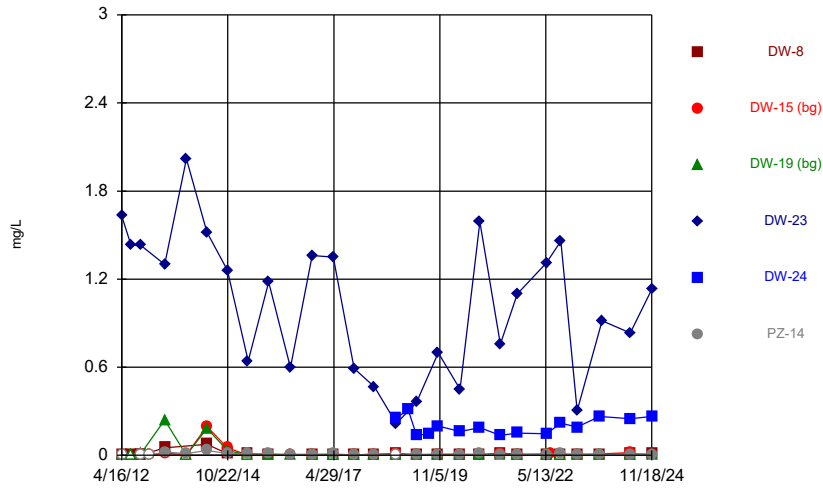
Constituent: cis-1,2-Dichloroethene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



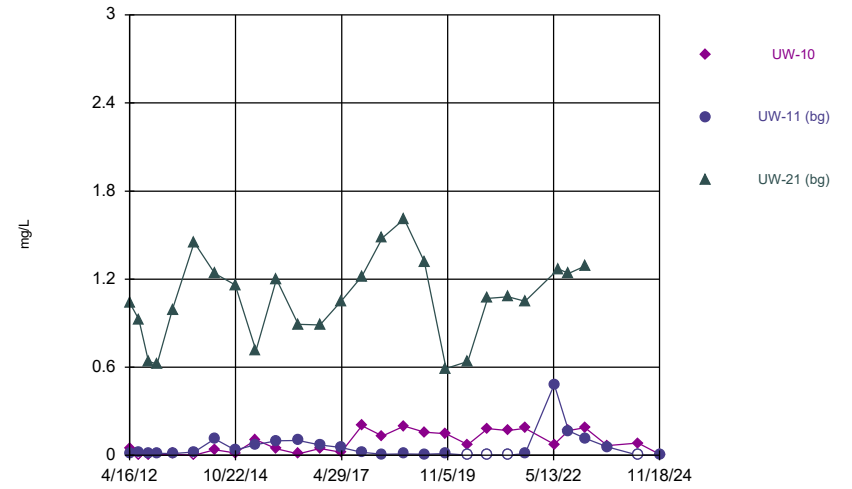
Constituent: cis-1,2-Dichloroethene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



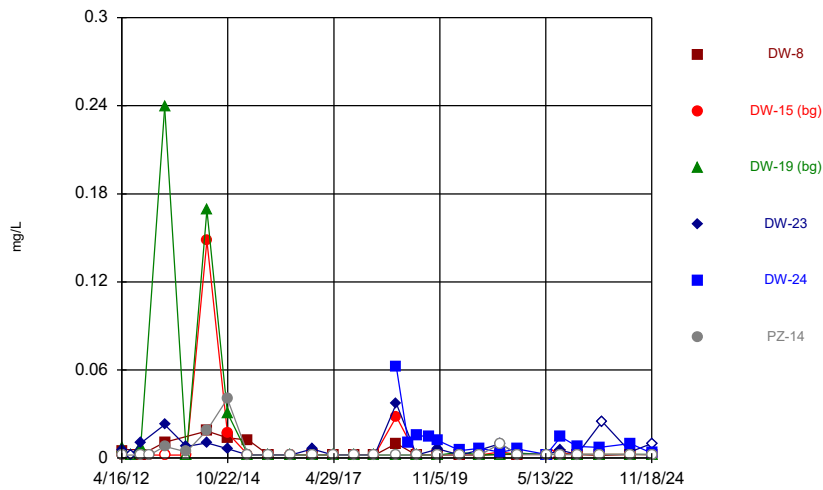
Constituent: Cobalt Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



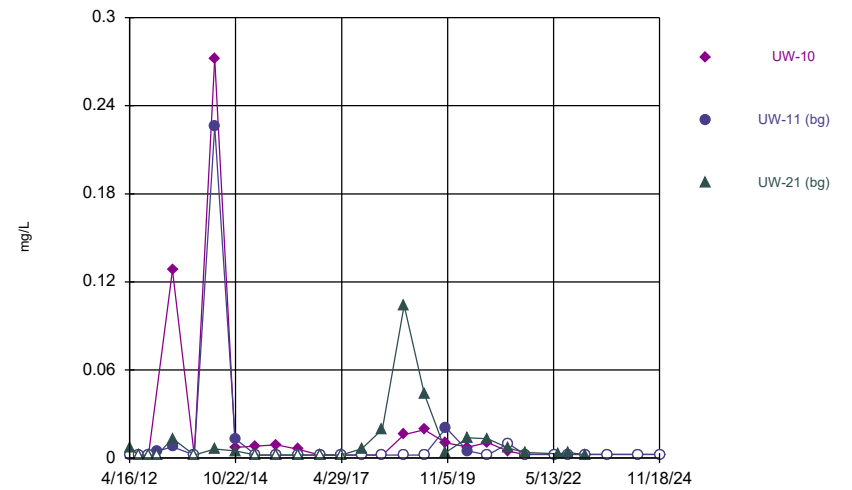
Constituent: Cobalt Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



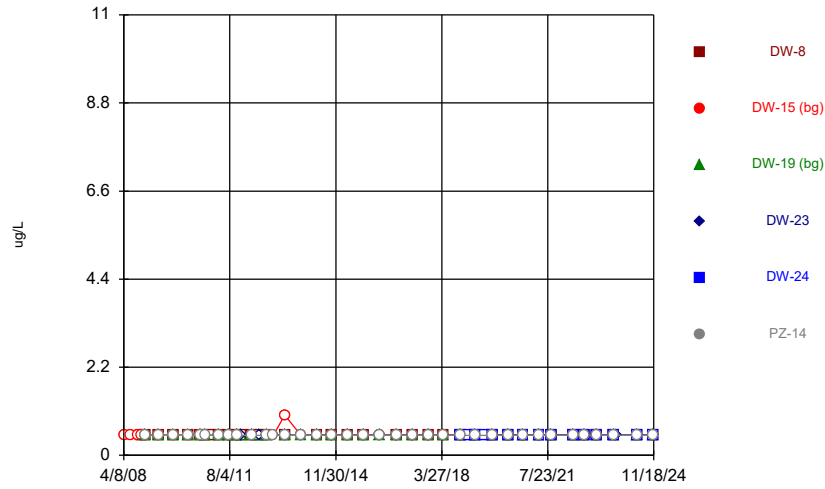
Constituent: Copper Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



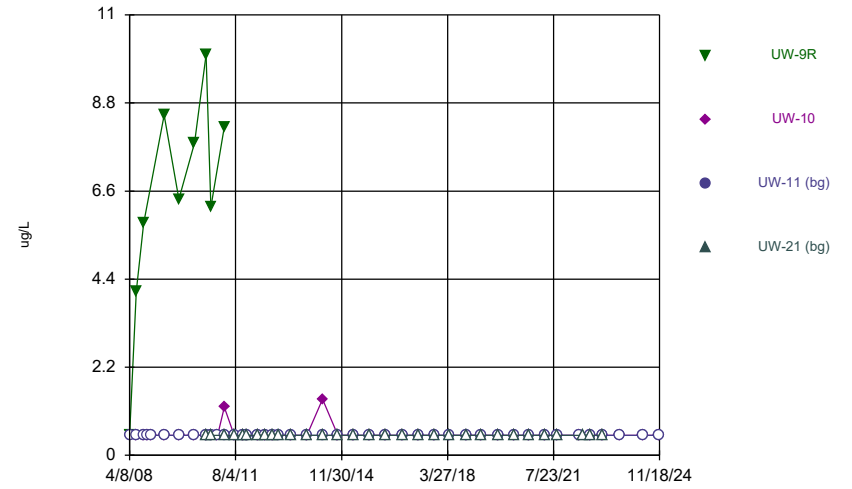
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



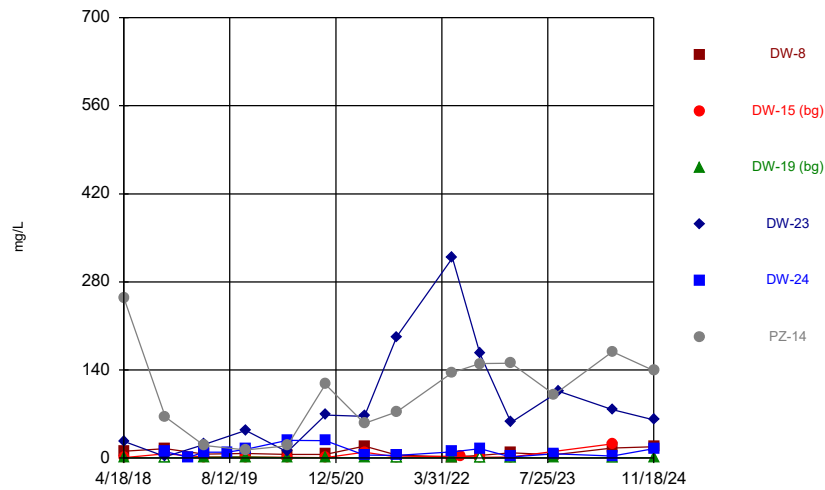
Constituent: Ethylbenzene Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



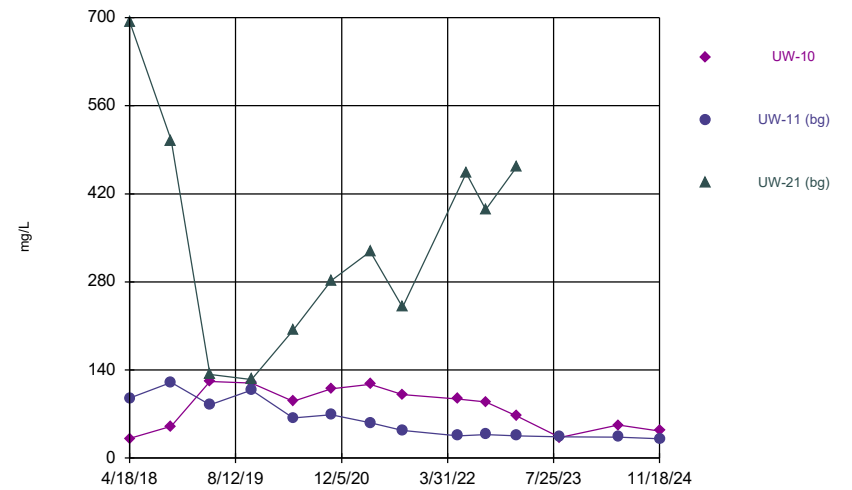
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



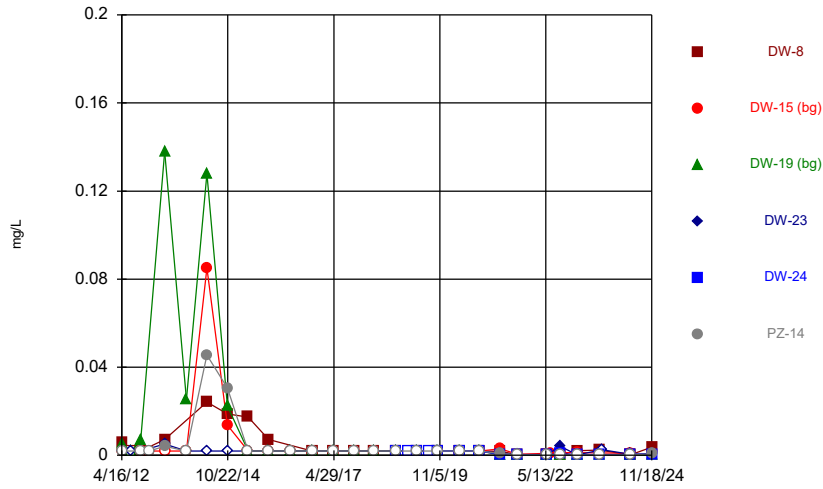
Constituent: Iron Analysis Run 2/24/2025 10:13 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



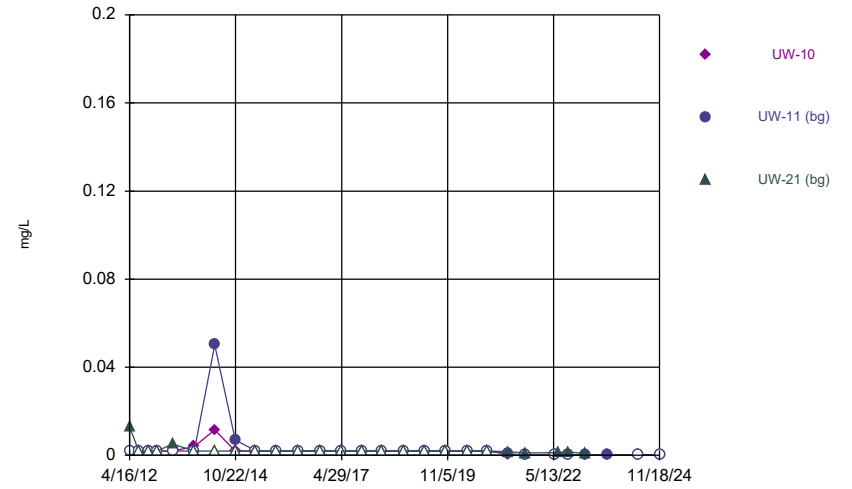
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



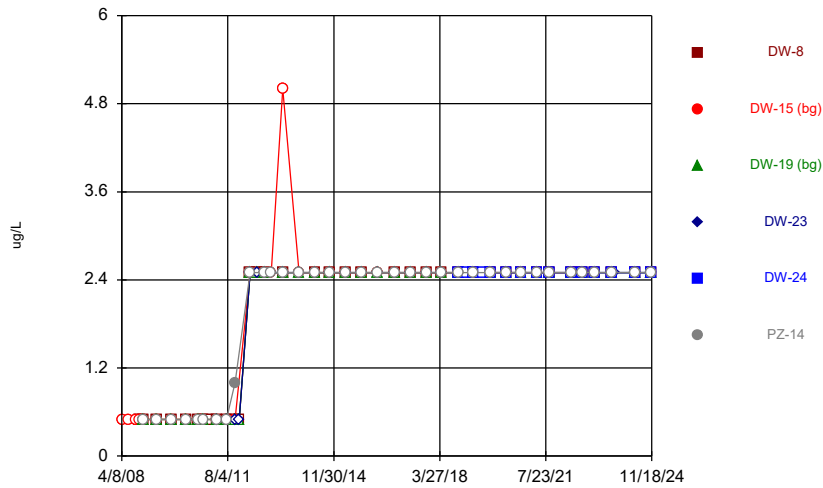
Constituent: Lead Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



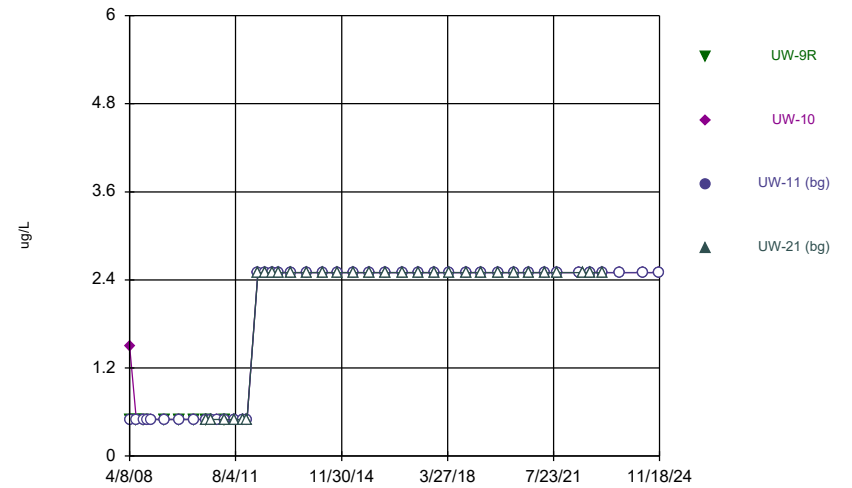
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



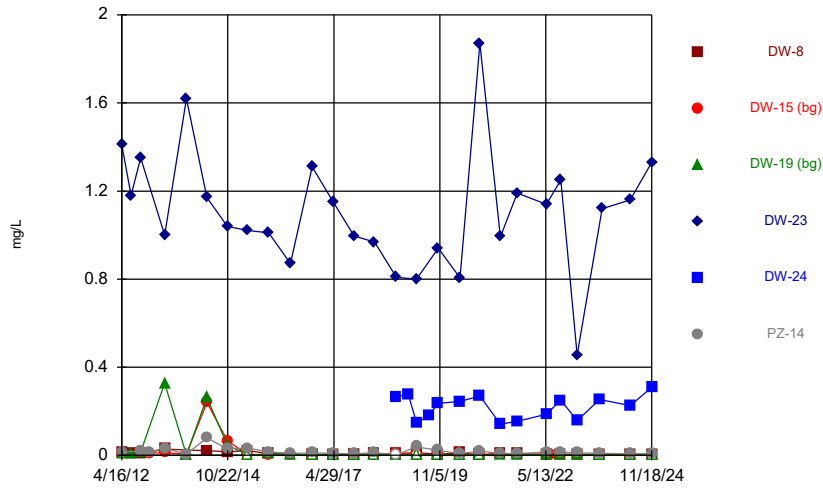
Constituent: Methylene Chloride Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



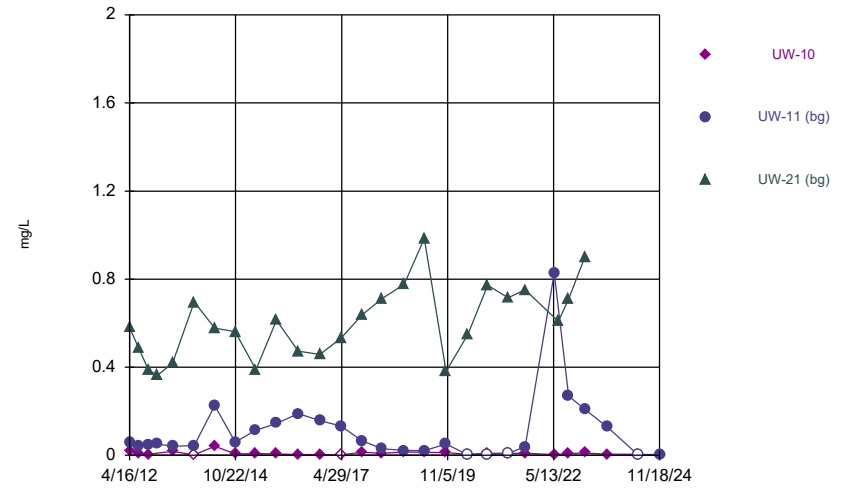
Constituent: Methylene Chloride Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



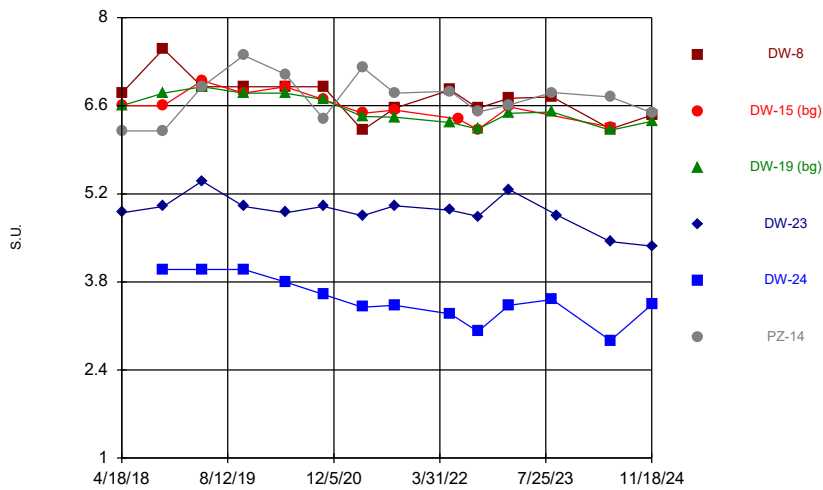
Constituent: Nickel Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



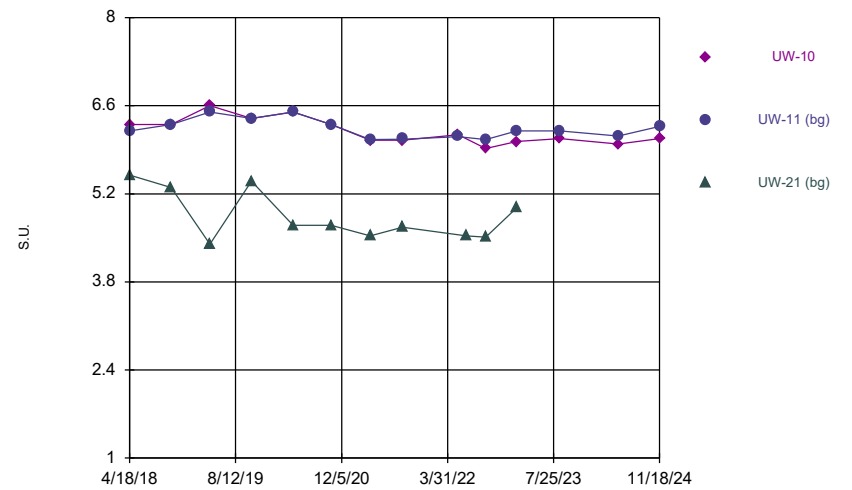
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



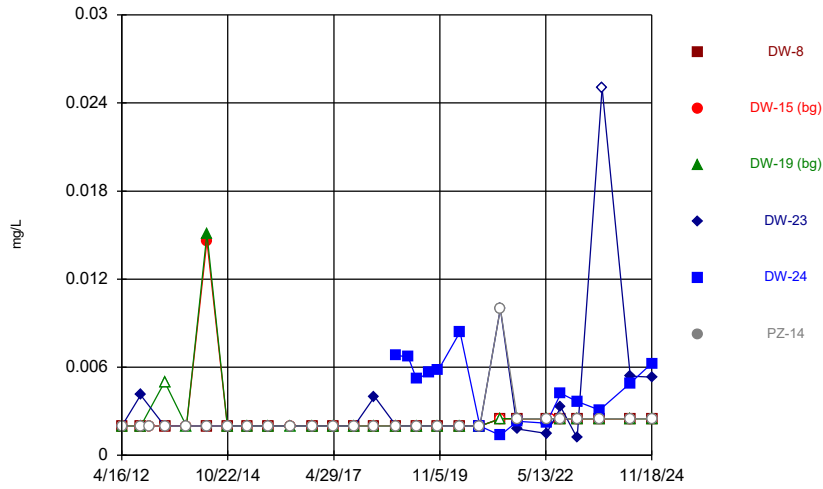
Constituent: pH Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



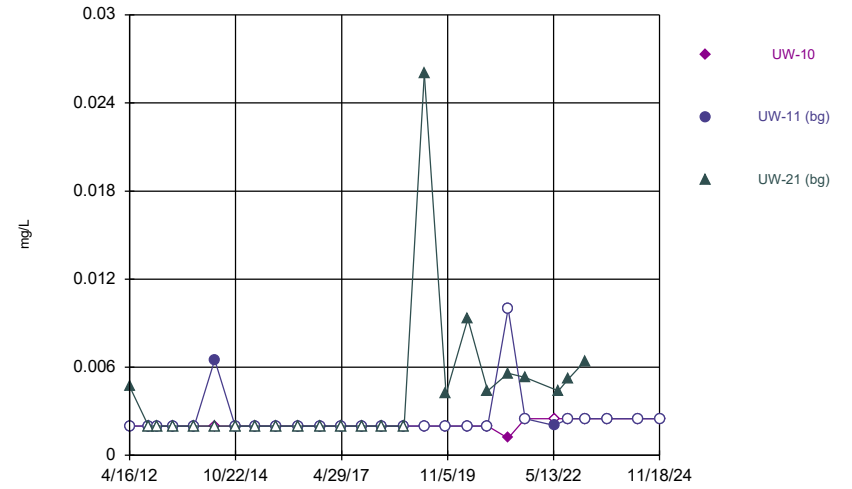
Constituent: pH Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



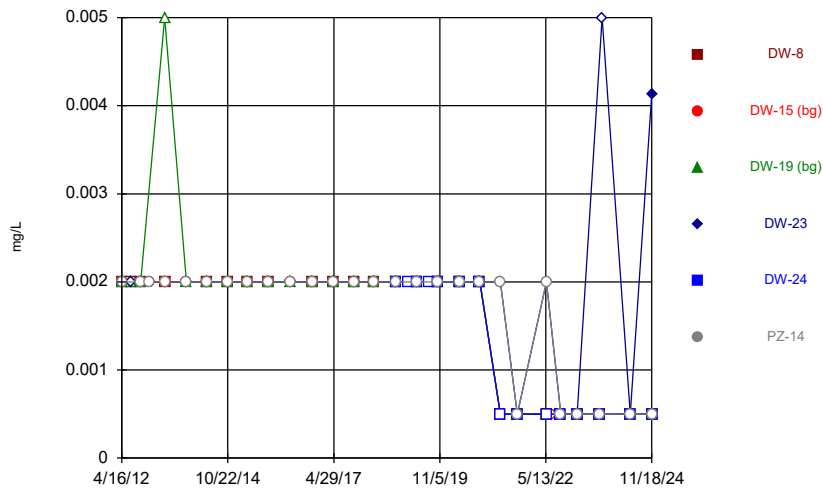
Constituent: Selenium Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



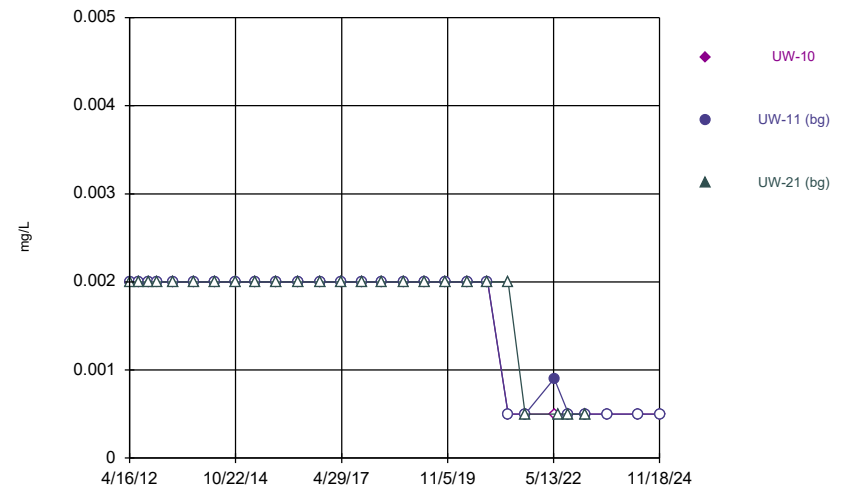
Constituent: Selenium Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



Constituent: Silver Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

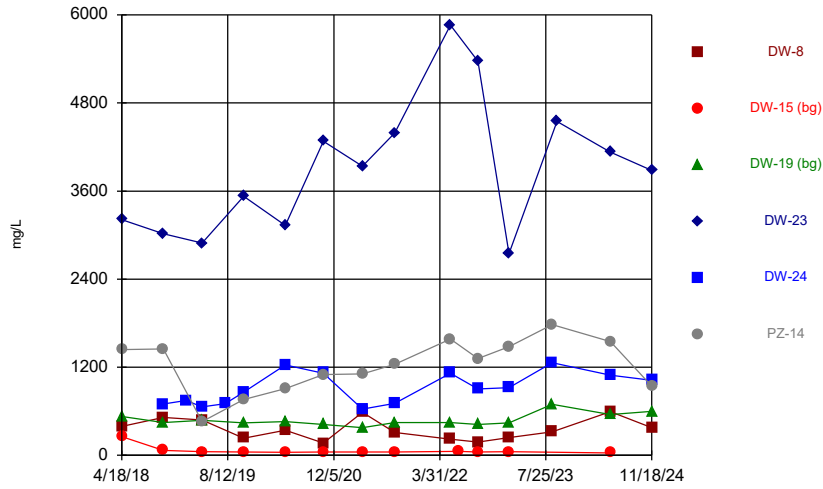
Time Series



Constituent: Silver Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

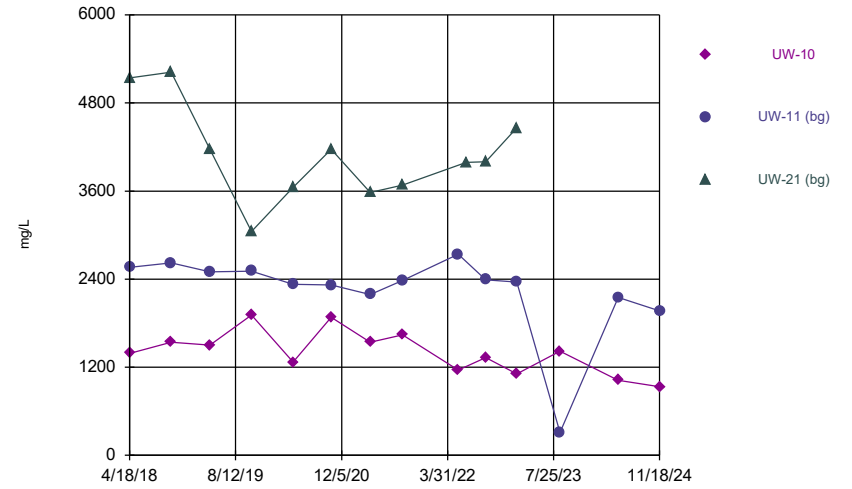


Time Series



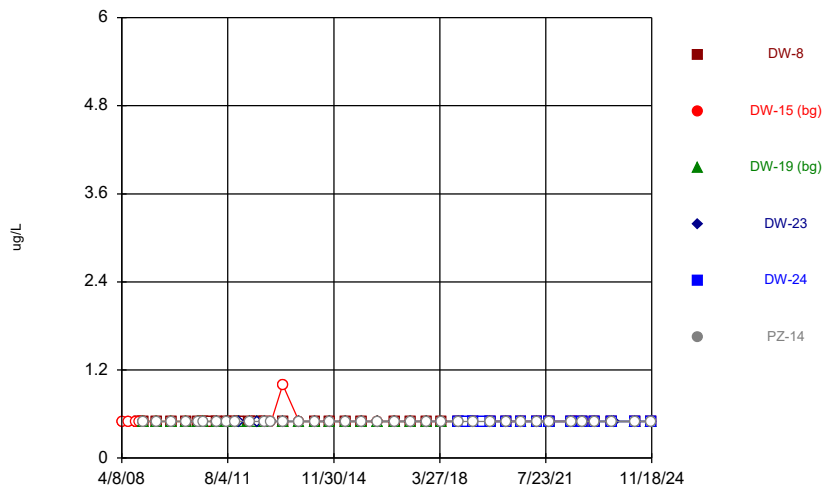
Constituent: Sulfate Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



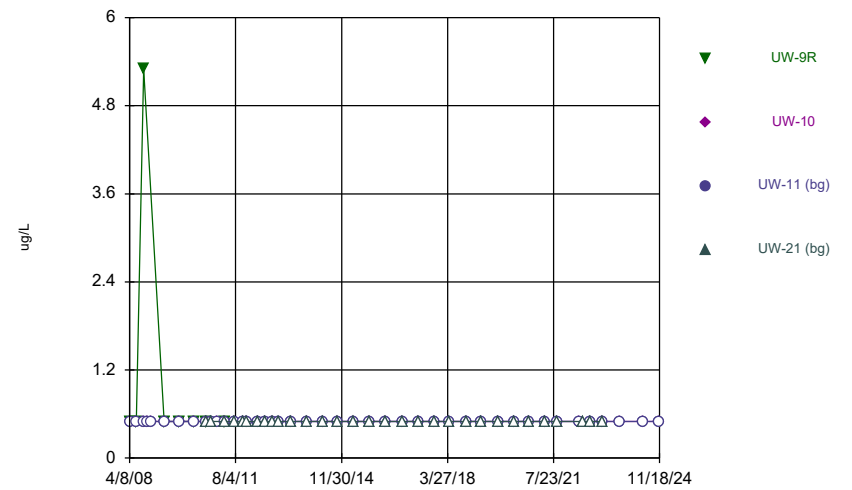
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



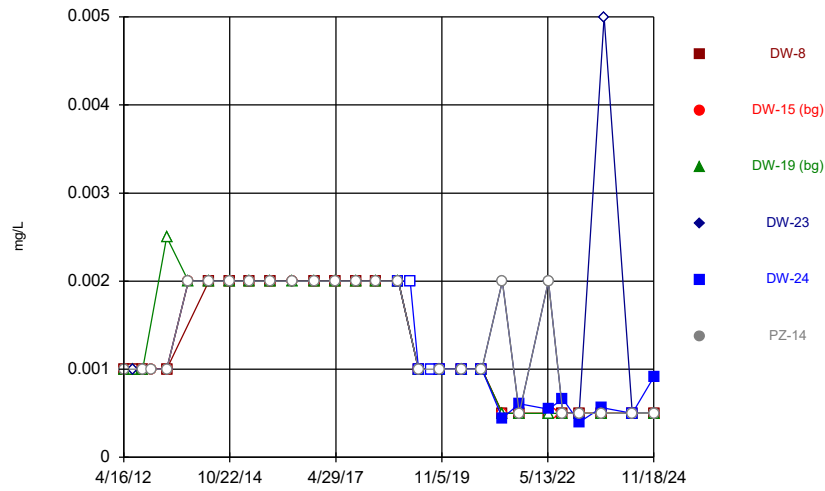
Constituent: Tetrachloroethene Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



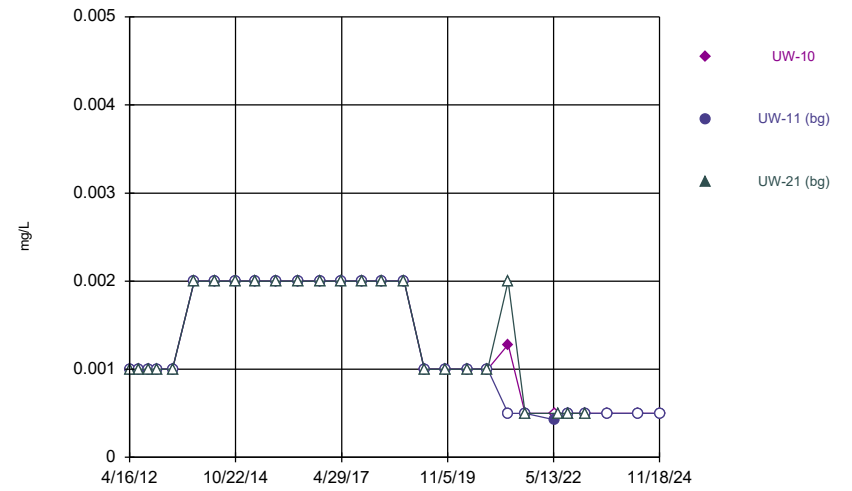
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



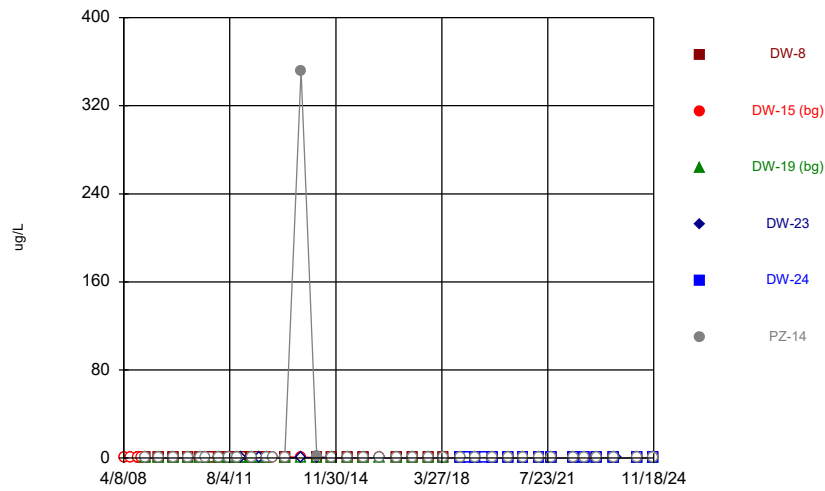
Constituent: Thallium Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



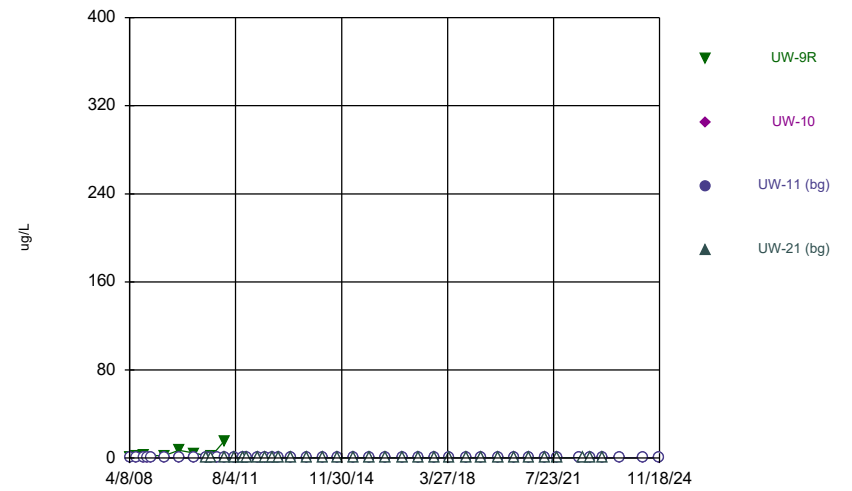
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



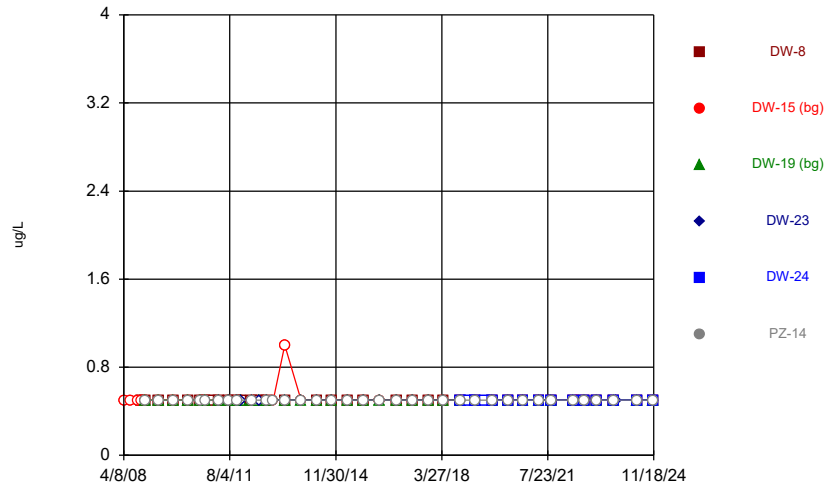
Constituent: Toluene Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



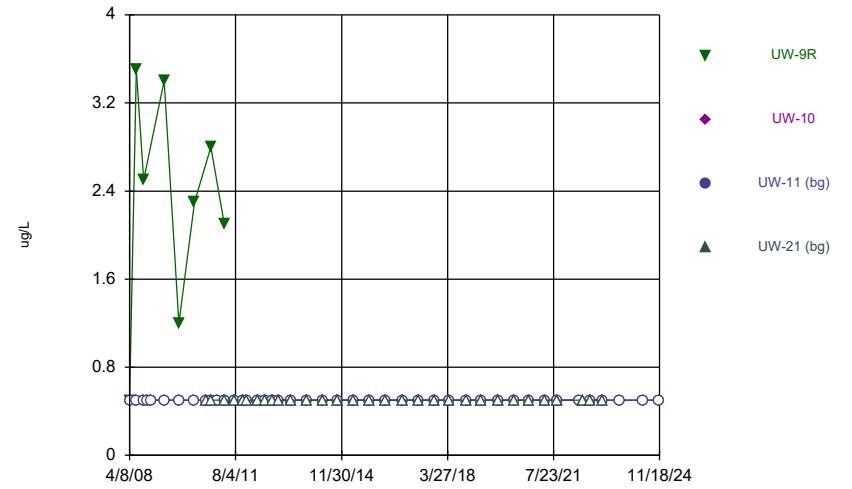
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



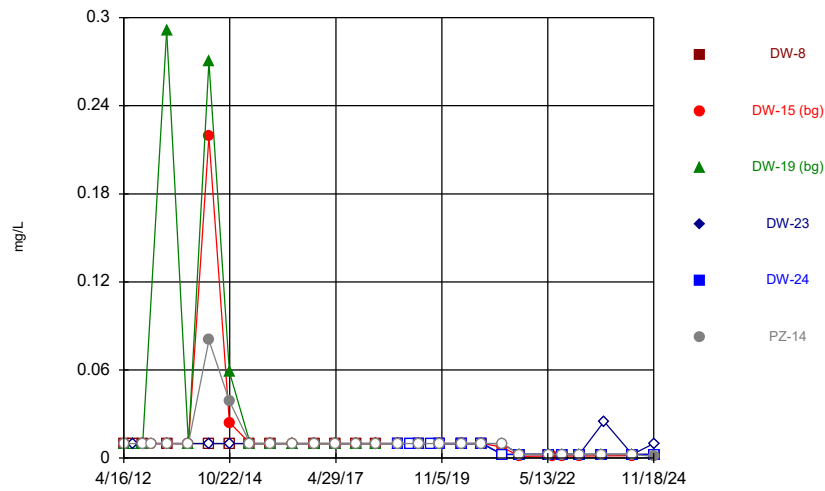
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



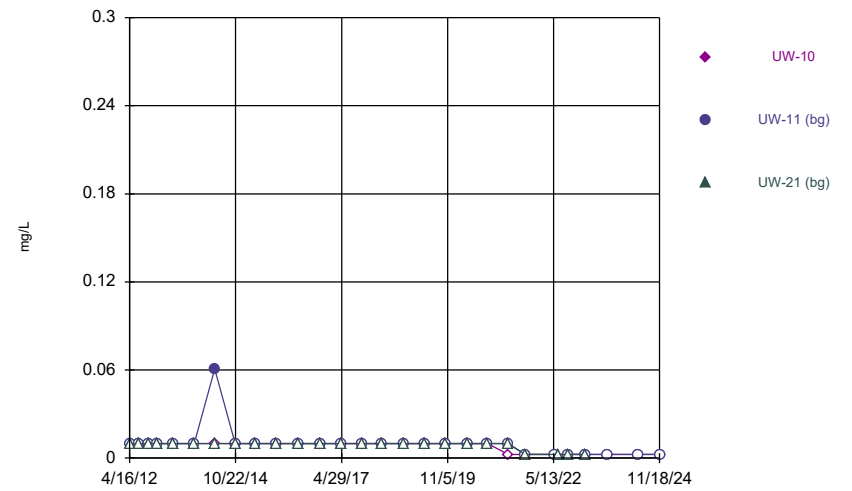
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



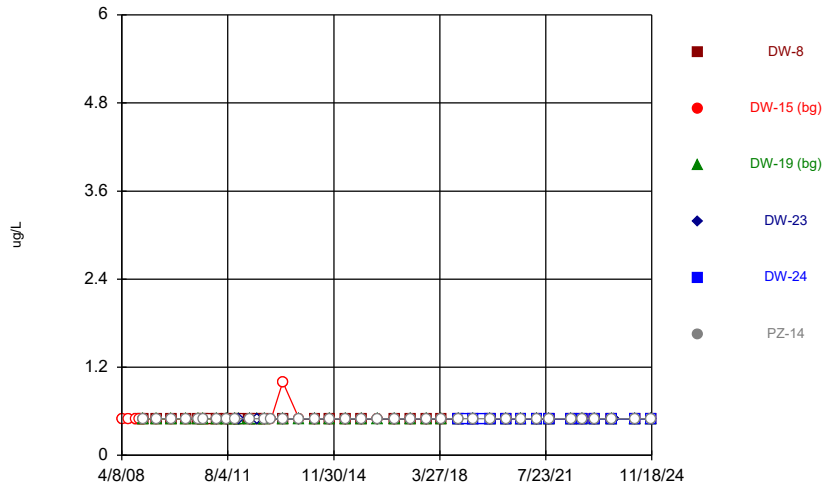
Constituent: Vanadium Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



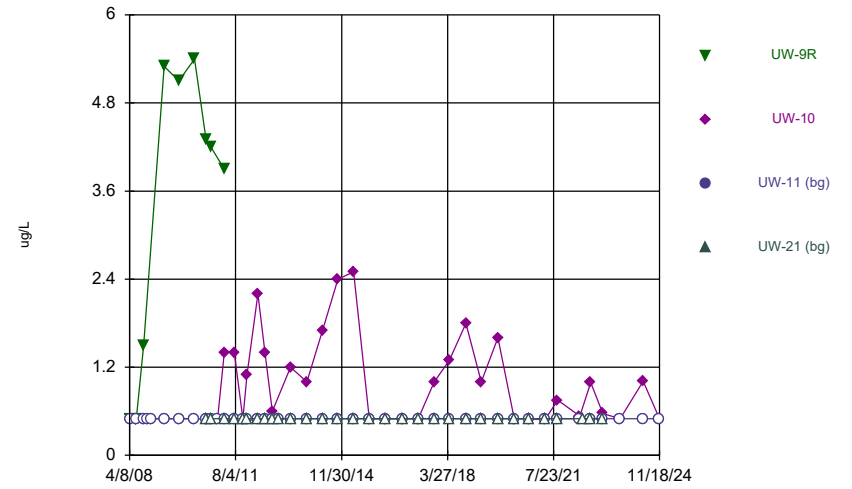
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



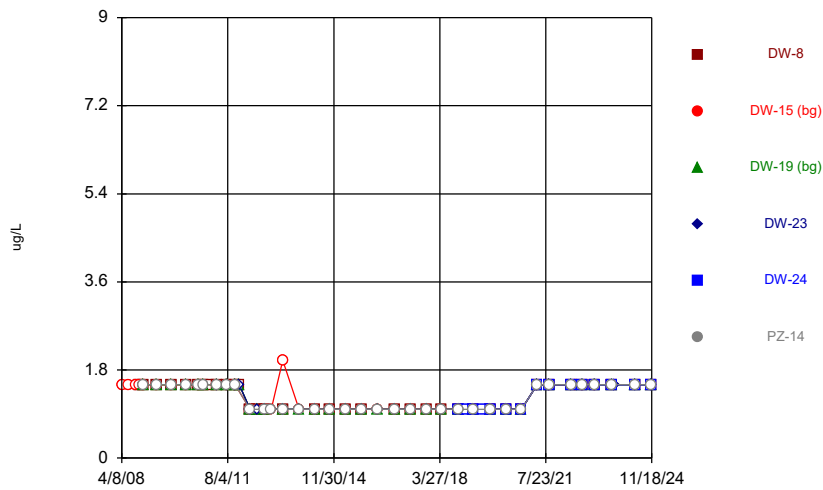
Constituent: Vinyl Chloride Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



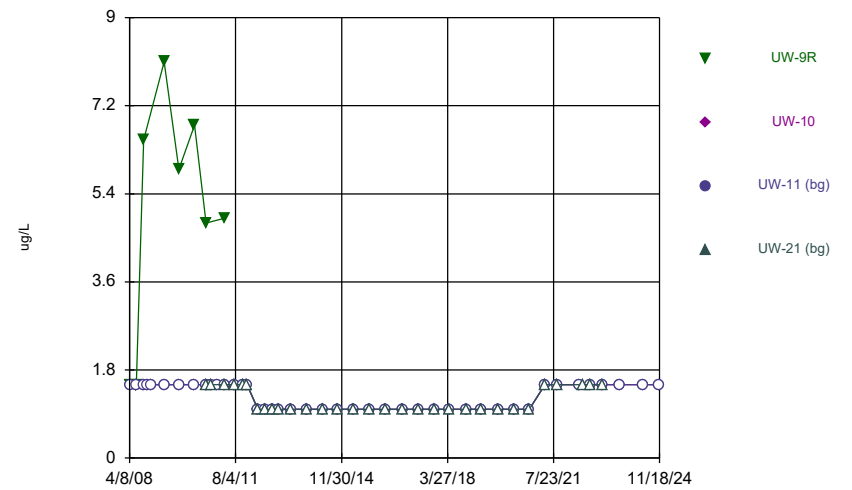
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Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



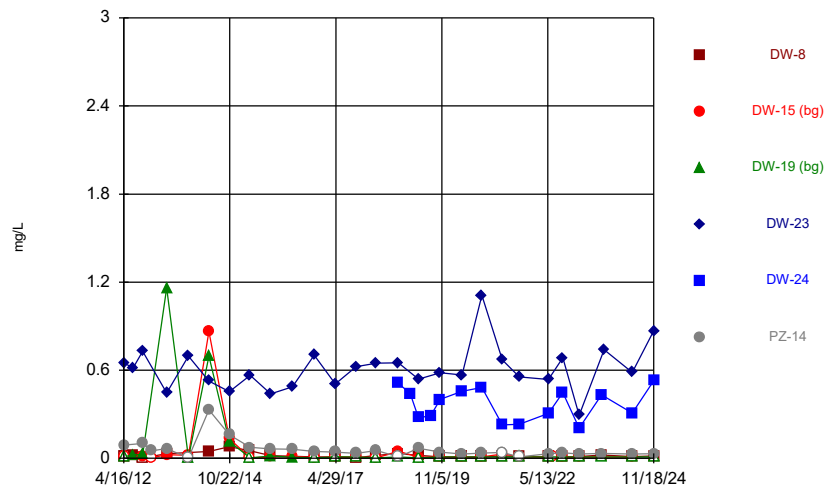
Constituent: Xylenes, total Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Time Series



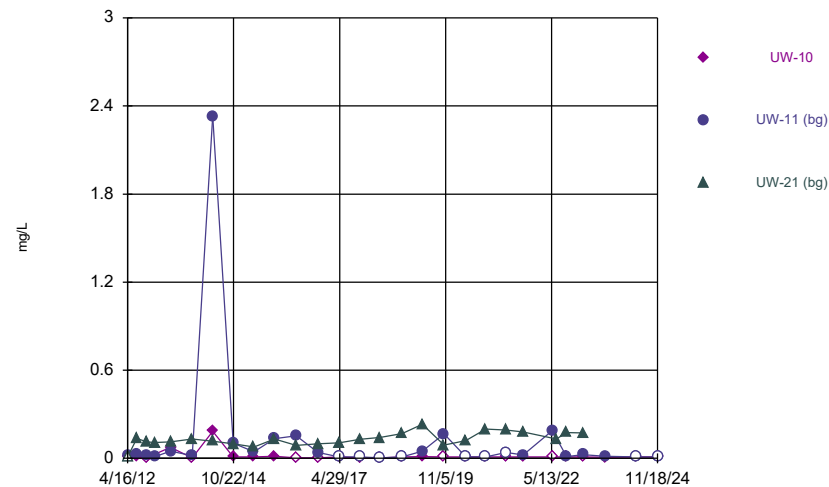
Constituent: Xylenes, total Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Zinc Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Time Series



Constituent: Zinc Analysis Run 2/24/2025 10:14 PM View: 2024AWQR-Time\_Series  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

## **Outlier Tests Summary Table and Graphs**

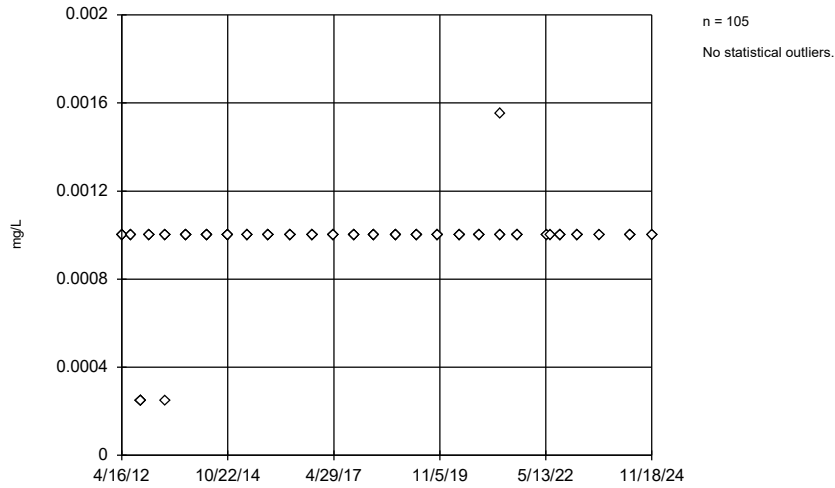
# BG Outlier Analysis

Mahaska County SLF    Client: SCS Engineers    Data: MCSWM Master Active    Printed 2/24/2025, 10:54 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Antimony (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	OH	NaN	105	0.0009695	0.0001703	n/a	n/a
<b>Arsenic (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0698,0.0059,0.0059,0.0059,0.001,0.001,0.001,0.0</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.00536</b>	<b>0.01542</b>	<b>unknown</b>	<b>ChiSquared</b>
<b>Barium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>1.82,0.326,0.351,1.42,1.33</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.1023</b>	<b>0.2586</b>	<b>unknown</b>	<b>ChiSquared</b>
<b>Beryllium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0138,0.0126,0.0125,0.0096</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>105</b>	<b>0.002078</b>	<b>0.002137</b>	<b>n/a</b>	<b>n/a</b>
Cadmium (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN	105	0.0007465	0.001283	unknown	ChiSquared
<b>Chromium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.183,0.16,0.152,0.105,0.0416,0.0319,0.0168</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>105</b>	<b>0.01034</b>	<b>0.02892</b>	<b>n/a</b>	<b>n/a</b>
<b>Cobalt (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>1.45,1.48,1.61</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.2768</b>	<b>0.4679</b>	<b>unknown</b>	<b>ChiSquared</b>
<b>Copper (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.148,0.0174,0.0283,0.239,0.169,0.0308,0.226,0.01</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.0129</b>	<b>0.03903</b>	<b>unknown</b>	<b>ShapiroFrancia</b>
<b>Lead (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0851,0.0137,0.00303,0.000539,0.000948,0.000902,</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.006189</b>	<b>0.02036</b>	<b>unknown</b>	<b>ChiSquared</b>
Nickel (mg/L)	DW-15,DW-19,UW-11...	No	n/a	n/a w/combined bg	NP (nrm)/OH	NaN	105	0.1825	0.2677	unknown	ChiSquared
<b>Selenium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.026,0.0151,0.0146,0.01,0.0093</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>102</b>	<b>0.003046</b>	<b>0.003183</b>	<b>n/a</b>	<b>n/a</b>
<b>Silver (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.005</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>105</b>	<b>0.001661</b>	<b>0.0007232</b>	<b>n/a</b>	<b>n/a</b>
<b>Thallium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.0025</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>105</b>	<b>0.001318</b>	<b>0.0006444</b>	<b>n/a</b>	<b>n/a</b>
<b>Vanadium (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.291,0.27,0.219,0.0607,0.0587</b>	<b>n/a w/combined bg</b>	<b>OH</b>	<b>NaN</b>	<b>105</b>	<b>0.01643</b>	<b>0.04302</b>	<b>n/a</b>	<b>n/a</b>
<b>Zinc (mg/L)</b>	<b>DW-15,DW-19,UW-11...</b>	<b>Yes</b>	<b>0.864,1.16,0.697,2.33</b>	<b>n/a w/combined bg</b>	<b>NP (nrm)/OH</b>	<b>NaN</b>	<b>105</b>	<b>0.09831</b>	<b>0.271</b>	<b>unknown</b>	<b>ChiSquared</b>

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

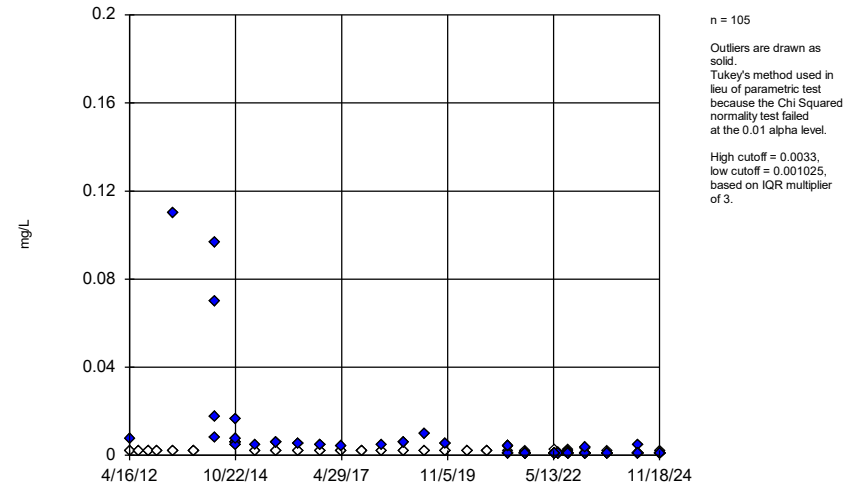
DW-15,DW-19,UW-11,UW-21



Constituent: Antimony Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

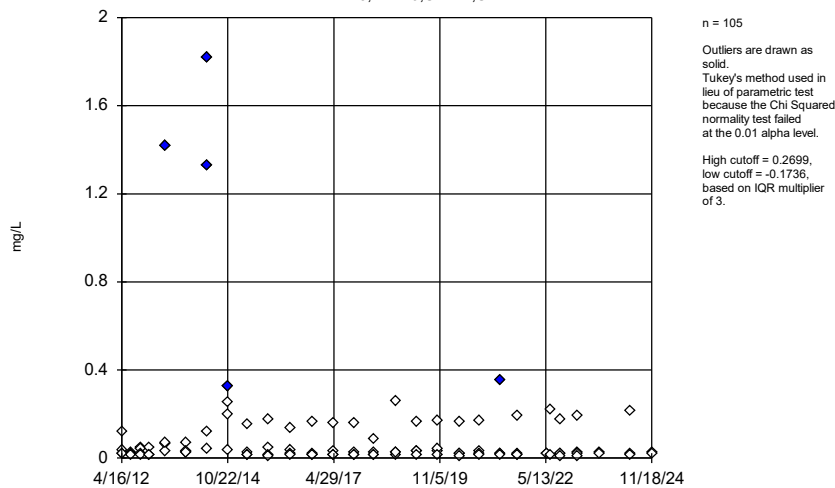
DW-15,DW-19,UW-11,UW-21



Constituent: Arsenic Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

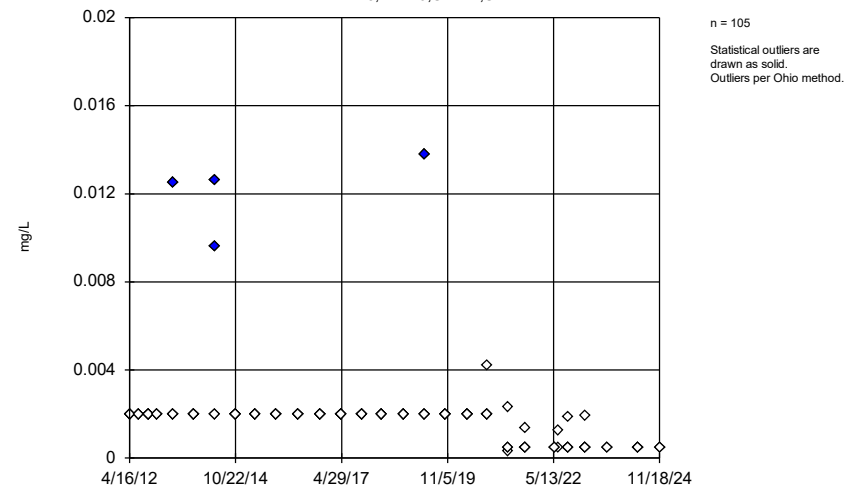
DW-15,DW-19,UW-11,UW-21



Constituent: Barium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21

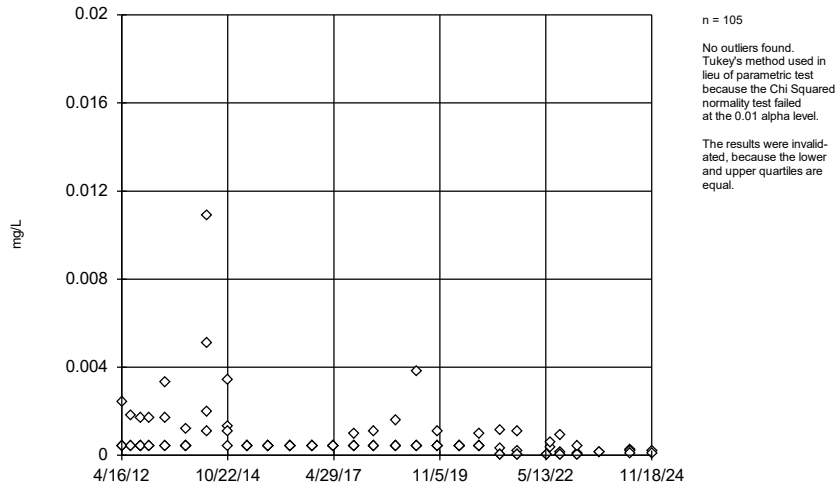


Constituent: Beryllium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active



### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

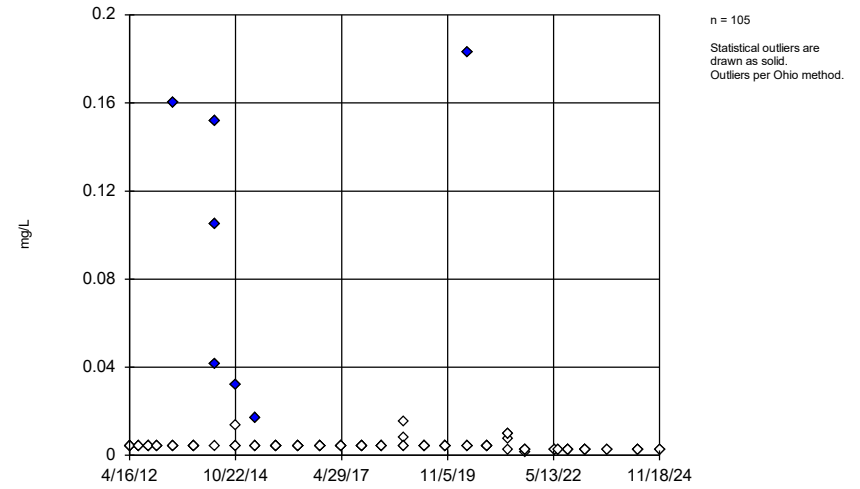
DW-15,DW-19,UW-11,UW-21



Constituent: Cadmium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

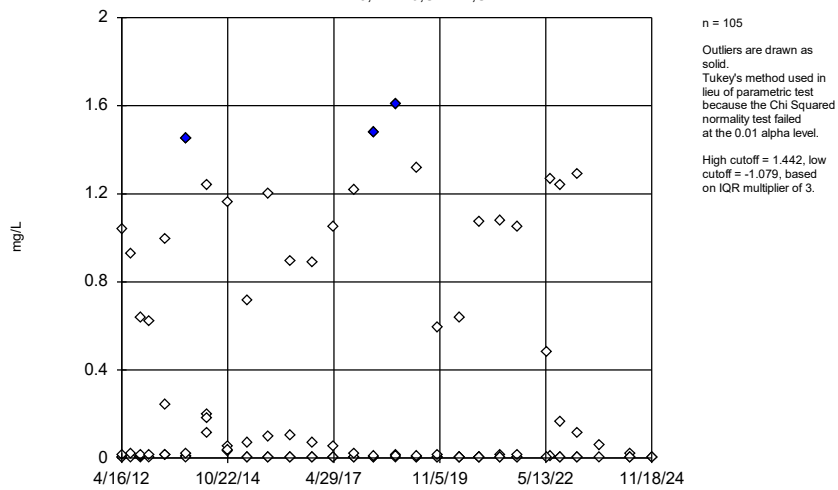
DW-15,DW-19,UW-11,UW-21



Constituent: Chromium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

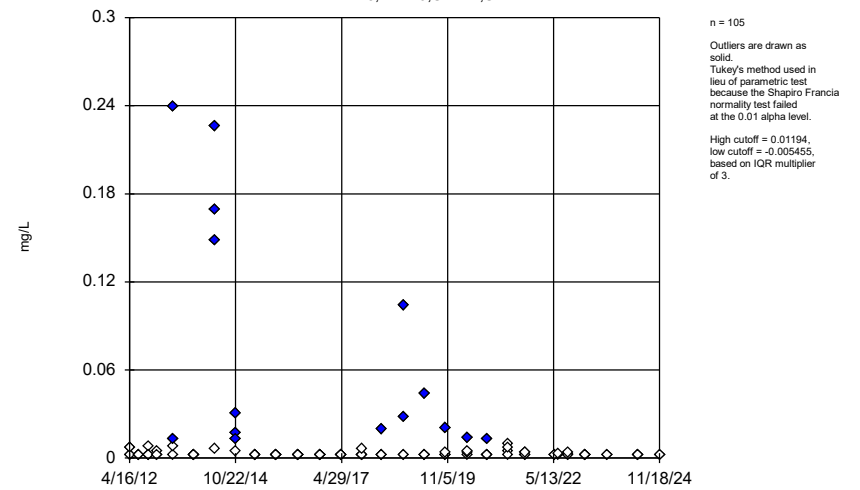
DW-15,DW-19,UW-11,UW-21



Constituent: Cobalt Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

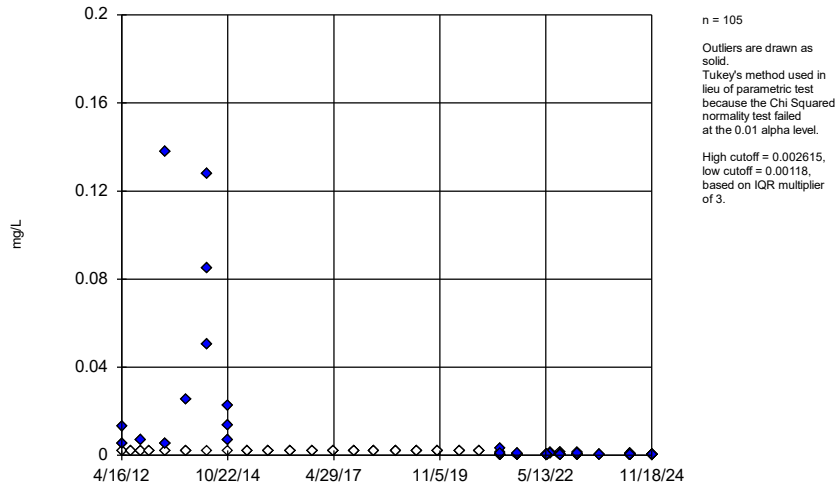
DW-15,DW-19,UW-11,UW-21



Constituent: Copper Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

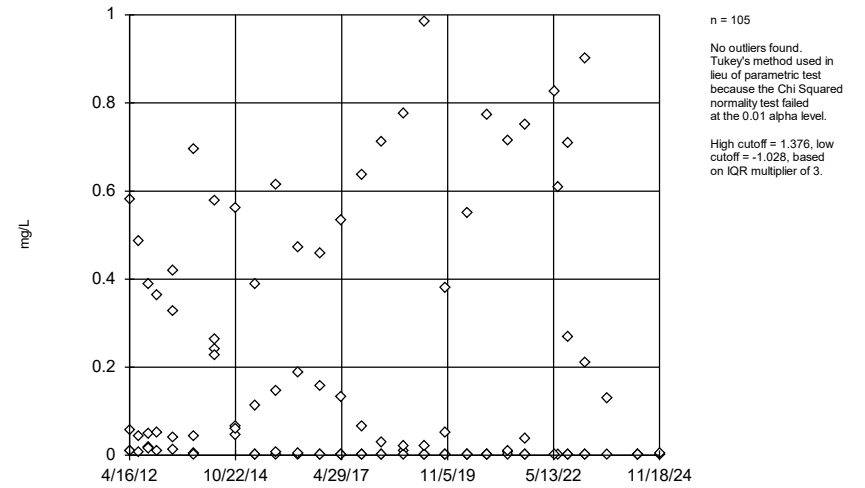
DW-15,DW-19,UW-11,UW-21



Constituent: Lead Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

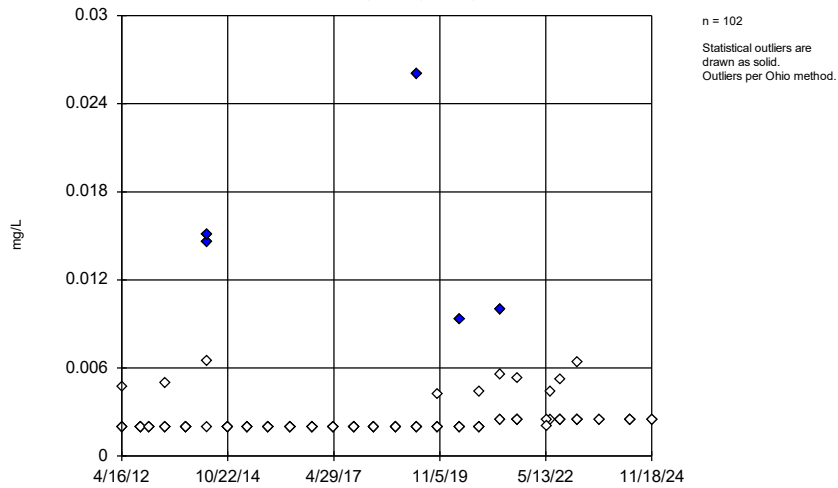
DW-15,DW-19,UW-11,UW-21



Constituent: Nickel Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

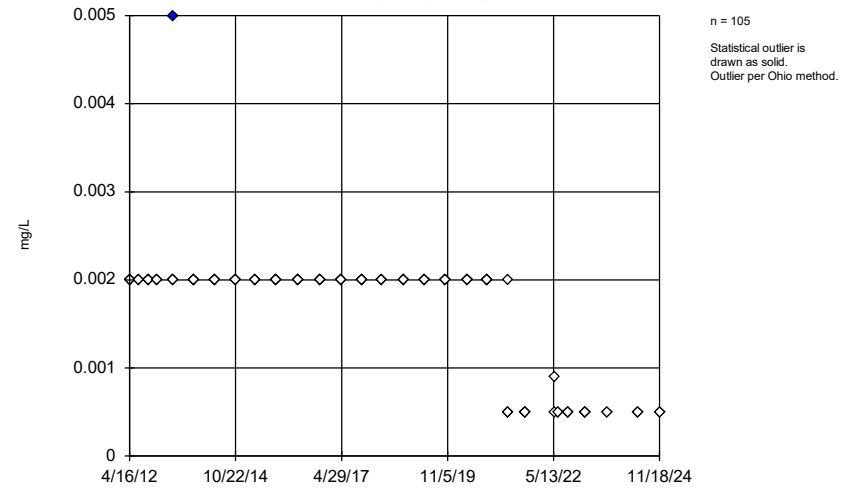
DW-15,DW-19,UW-11,UW-21



Constituent: Selenium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

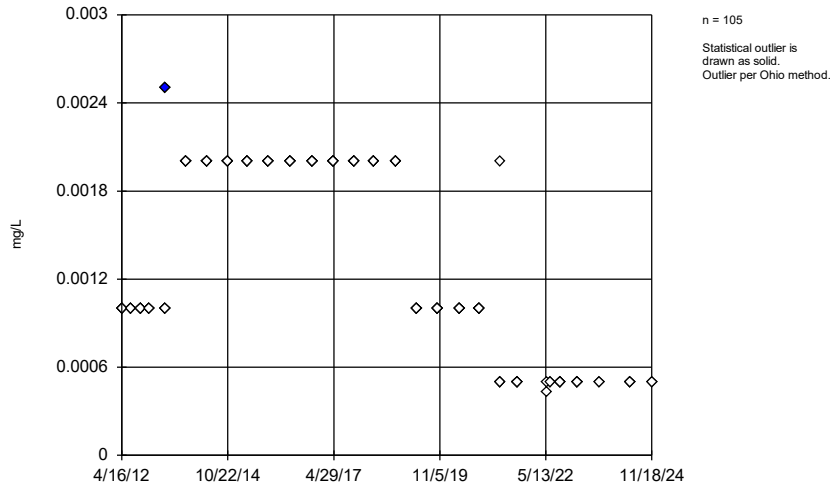
DW-15,DW-19,UW-11,UW-21



Constituent: Silver Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

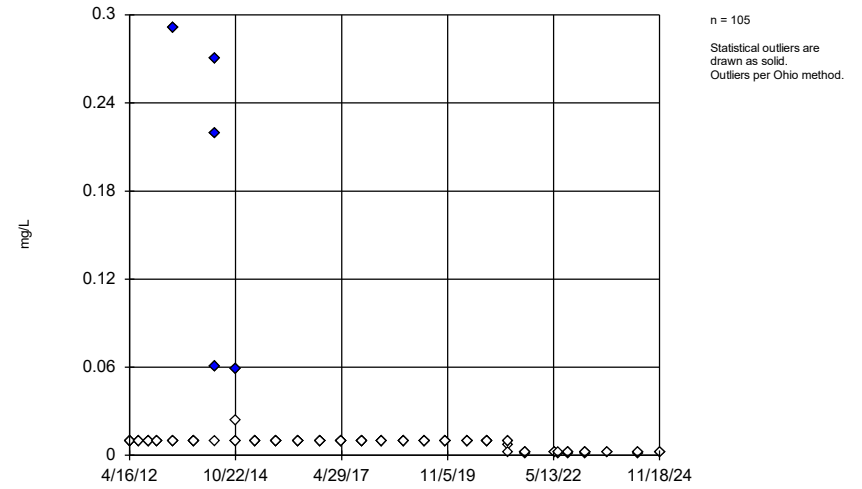
DW-15,DW-19,UW-11,UW-21



Constituent: Thallium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Ohio EPA 0715 Outlier Algorithm, Pooled Background

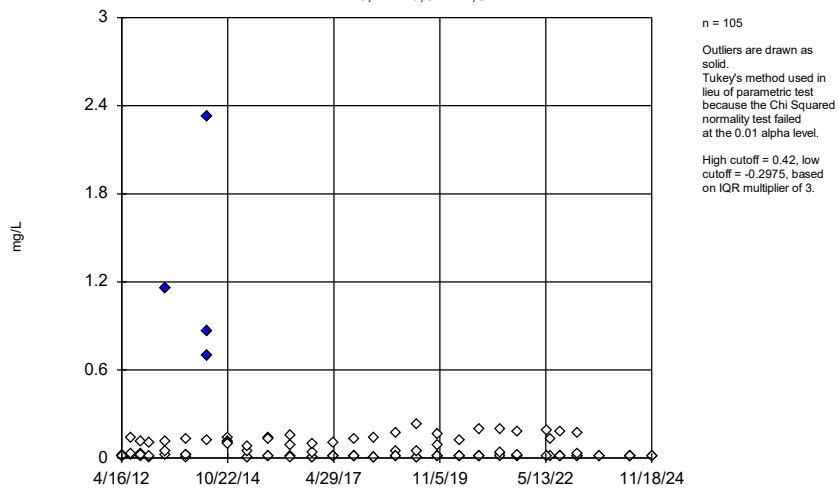
DW-15,DW-19,UW-11,UW-21



Constituent: Vanadium Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

### Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm, Pooled Background

DW-15,DW-19,UW-11,UW-21



Constituent: Zinc Analysis Run 2/24/2025 10:50 PM View: 2024AWQR-BG\_Outliers  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

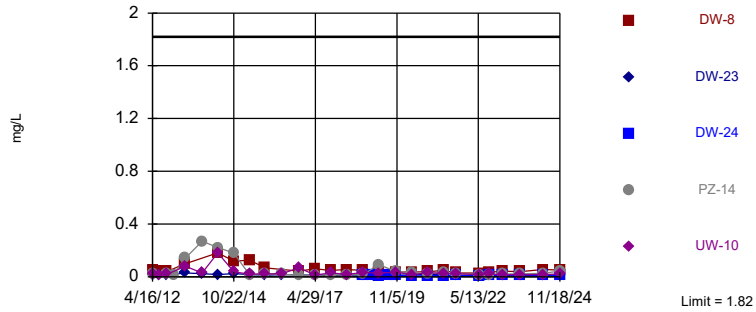
## **Interwell Prediction Limit Summary Table and Graphs**

# DM and AM Prediction Limit

Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active Printed 2/24/2025, 11:05 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Wells</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	DW-8	1.82	n/a	11/18/2024	0.0516	No	105	UW-21,UW-11,DW-19,DW-15	0	n/a	0.0001784	NP Inter (normality) ...
Barium (mg/L)	DW-23	1.82	n/a	11/18/2024	0.0133	No	105	UW-21,UW-11,DW-19,DW-15	0	n/a	0.0001784	NP Inter (normality) ...
Barium (mg/L)	DW-24	1.82	n/a	11/18/2024	0.0125	No	105	UW-21,UW-11,DW-19,DW-15	0	n/a	0.0001784	NP Inter (normality) ...
Barium (mg/L)	PZ-14	1.82	n/a	11/18/2024	0.0435	No	105	UW-21,UW-11,DW-19,DW-15	0	n/a	0.0001784	NP Inter (normality) ...
Barium (mg/L)	UW-10	1.82	n/a	11/18/2024	0.0216	No	105	UW-21,UW-11,DW-19,DW-15	0	n/a	0.0001784	NP Inter (normality) ...
Beryllium (mg/L)	DW-24	0.0138	n/a	11/18/2024	0.00774	No	105	DW-15,UW-11,DW-19,UW-21	90.48	n/a	0.0001784	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	DW-23	0.0109	n/a	11/18/2024	0.00512	No	105	DW-19,UW-11,DW-15,UW-21	66.67	n/a	0.0001784	NP Inter (NDs) 1 of 2
<b>Cadmium (mg/L)</b>	<b>DW-24</b>	<b>0.0109</b>	<b>n/a</b>	<b>11/18/2024</b>	<b>0.0122</b>	<b>Yes</b>	<b>105</b>	<b>DW-19,UW-11,DW-15,UW-21</b>	<b>66.67</b>	<b>n/a</b>	<b>0.0001784</b>	<b>NP Inter (NDs) 1 of 2</b>
Cobalt (mg/L)	DW-8	1.61	n/a	11/18/2024	0.00856	No	105	UW-11,DW-19,DW-15,UW-21	18.1	n/a	0.0001784	NP Inter (normality) ...
Cobalt (mg/L)	DW-23	1.61	n/a	11/18/2024	1.13	No	105	UW-11,DW-19,DW-15,UW-21	18.1	n/a	0.0001784	NP Inter (normality) ...
Cobalt (mg/L)	DW-24	1.61	n/a	11/18/2024	0.264	No	105	UW-11,DW-19,DW-15,UW-21	18.1	n/a	0.0001784	NP Inter (normality) ...
Cobalt (mg/L)	PZ-14	1.61	n/a	11/18/2024	0.0062	No	105	UW-11,DW-19,DW-15,UW-21	18.1	n/a	0.0001784	NP Inter (normality) ...
Cobalt (mg/L)	UW-10	1.61	n/a	11/18/2024	0.00831	No	105	UW-11,DW-19,DW-15,UW-21	18.1	n/a	0.0001784	NP Inter (normality) ...
Lead (mg/L)	DW-8	0.138	n/a	11/18/2024	0.0037	No	105	UW-11,DW-19,DW-15,UW-21	73.33	n/a	0.0001784	NP Inter (NDs) 1 of 2
Lead (mg/L)	DW-23	0.138	n/a	11/18/2024	0.000736	No	105	UW-11,DW-19,DW-15,UW-21	73.33	n/a	0.0001784	NP Inter (NDs) 1 of 2
Lead (mg/L)	PZ-14	0.138	n/a	11/18/2024	0.000581	No	105	UW-11,DW-19,DW-15,UW-21	73.33	n/a	0.0001784	NP Inter (NDs) 1 of 2
Nickel (mg/L)	DW-8	0.985	n/a	11/18/2024	0.00524	No	105	DW-19,DW-15,UW-11,UW-21	30.48	n/a	0.0001784	NP Inter (normality) ...
<b>Nickel (mg/L)</b>	<b>DW-23</b>	<b>0.985</b>	<b>n/a</b>	<b>11/18/2024</b>	<b>1.33</b>	<b>Yes</b>	<b>105</b>	<b>DW-19,DW-15,UW-11,UW-21</b>	<b>30.48</b>	<b>n/a</b>	<b>0.0001784</b>	<b>NP Inter (normality) ...</b>
Nickel (mg/L)	DW-24	0.985	n/a	11/18/2024	0.308	No	105	DW-19,DW-15,UW-11,UW-21	30.48	n/a	0.0001784	NP Inter (normality) ...
Nickel (mg/L)	PZ-14	0.985	n/a	11/18/2024	0.00647	No	105	DW-19,DW-15,UW-11,UW-21	30.48	n/a	0.0001784	NP Inter (normality) ...
Selenium (mg/L)	DW-23	0.026	n/a	11/18/2024	0.00532	No	102	DW-15,DW-19,UW-21,UW-11	86.27	n/a	0.0001871	NP Inter (NDs) 1 of 2
Selenium (mg/L)	DW-24	0.026	n/a	11/18/2024	0.00626	No	102	DW-15,DW-19,UW-21,UW-11	86.27	n/a	0.0001871	NP Inter (NDs) 1 of 2
Silver (mg/L)	DW-23	0.005	n/a	11/18/2024	0.00413	No	105	UW-21,DW-15,UW-11,DW-19	99.05	n/a	0.0001784	NP Inter (NDs) 1 of 2
Zinc (mg/L)	DW-23	2.33	n/a	11/18/2024	0.868	No	105	DW-19,DW-15,UW-11,UW-21	41.9	n/a	0.0001784	NP Inter (normality) ...
Zinc (mg/L)	DW-24	2.33	n/a	11/18/2024	0.529	No	105	DW-19,DW-15,UW-11,UW-21	41.9	n/a	0.0001784	NP Inter (normality) ...
Zinc (mg/L)	PZ-14	2.33	n/a	11/18/2024	0.0313	No	105	DW-19,DW-15,UW-11,UW-21	41.9	n/a	0.0001784	NP Inter (normality) ...

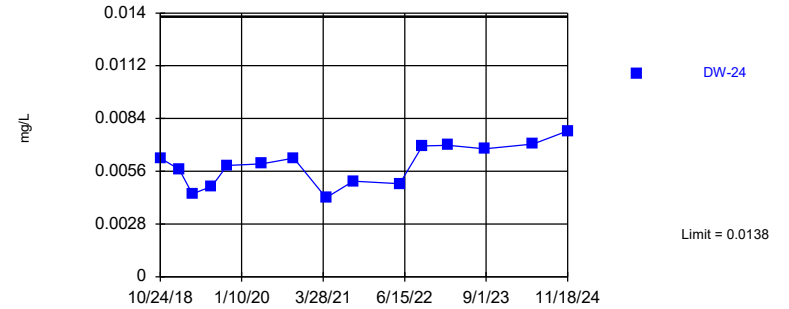
Within Limit Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 105 background values. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 5 points to limit. Assumes 2 future values.

Constituent: Barium Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

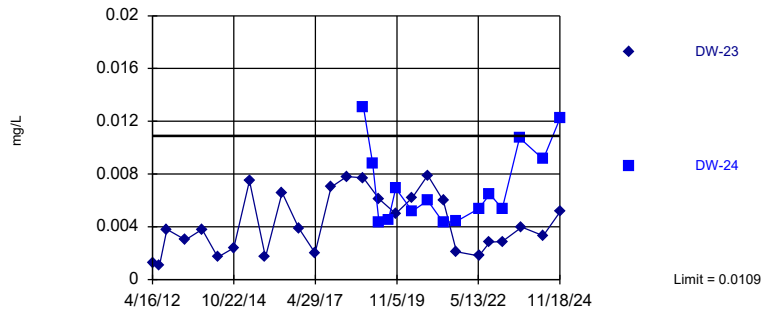
Within Limit Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 105 background values. 90.48% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Assumes 6 future values.

Constituent: Beryllium Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

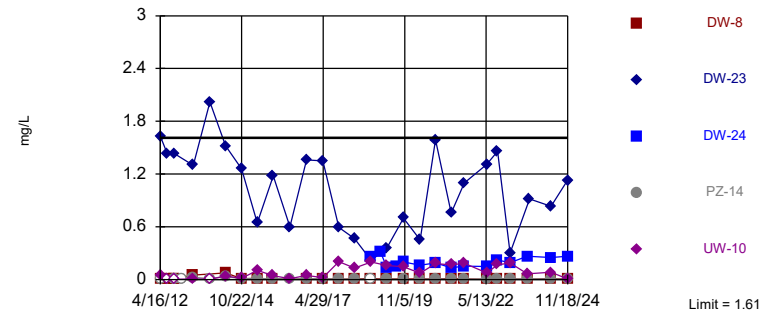
Exceeds Limit: DW-24 Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 105 background values. 66.67% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 2 points to limit. Assumes 5 future values.

Constituent: Cadmium Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit Prediction Limit Interwell Non-parametric

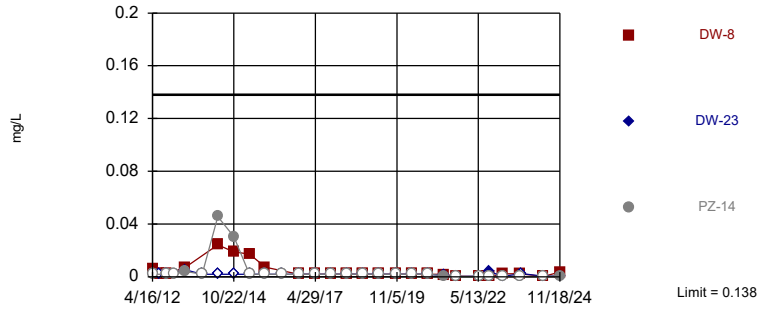


Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 105 background values. 18.1% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 5 points to limit. Assumes 2 future values.

Constituent: Cobalt Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

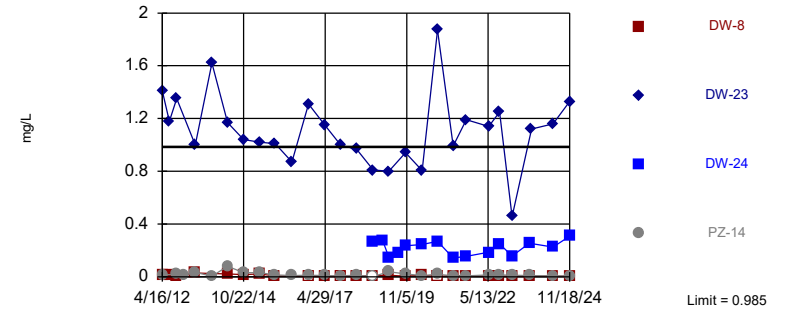


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 105 background values. 73.33% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 3 points to limit. Assumes 4 future values.

Constituent: Lead Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Exceeds Limit: DW-23

Prediction Limit  
Interwell Non-parametric

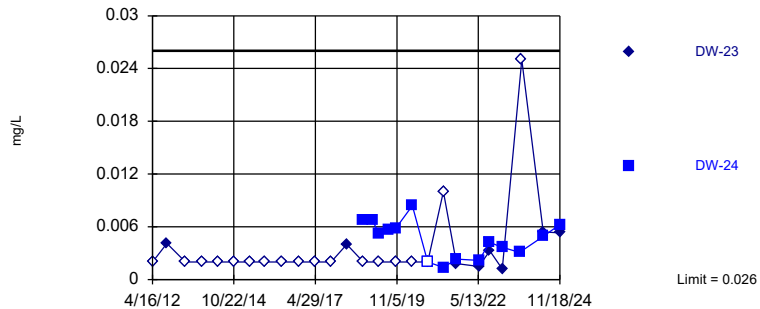


Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 105 background values. 30.48% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 4 points to limit. Assumes 3 future values.

Constituent: Nickel Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

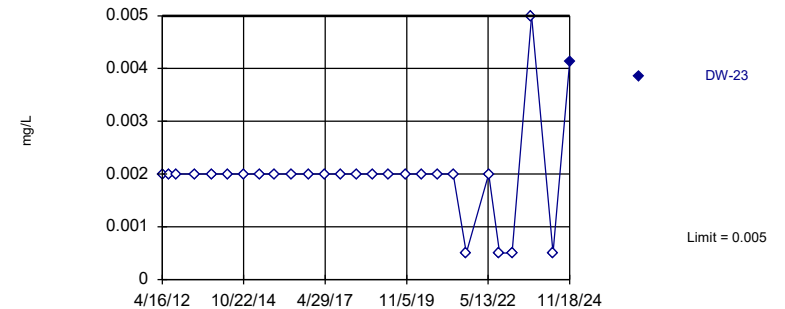


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 102 background values. 86.27% NDs. Annual per-constituent alpha = 0.002617. Individual comparison alpha = 0.0001871 (1 of 2). Comparing 2 points to limit. Assumes 5 future values.

Constituent: Selenium Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

Prediction Limit  
Interwell Non-parametric

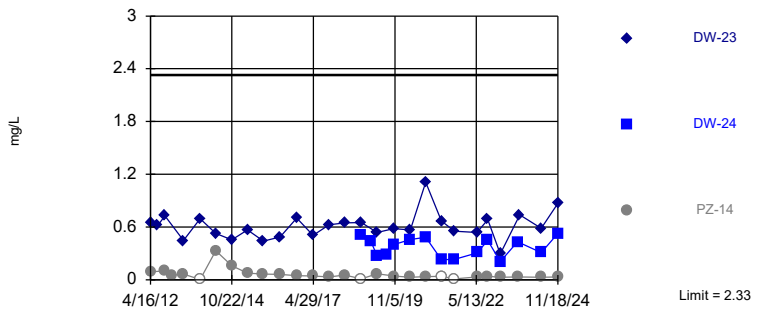


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 105 background values. 99.05% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Assumes 6 future values.

Constituent: Silver Analysis Run 2/24/2025 11:00 PM View: 2024AWQR-DMandAM Prediction Limit  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

Within Limit

### Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Chi Squared normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 105 background values. 41.9% NDs. Annual per-constituent alpha = 0.002495. Individual comparison alpha = 0.0001784 (1 of 2). Comparing 3 points to limit. Assumes 4 future values.



## **Intrawell Prediction Limit Summary Table and Graphs**

# DW-23 Intrawell Prediction Limit

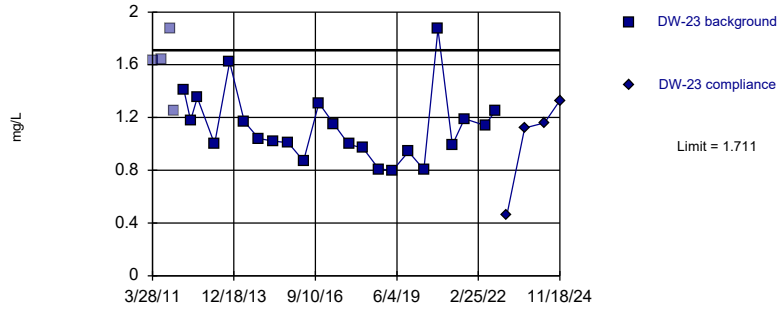
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active Printed 2/24/2025, 11:45 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Wells</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Nickel (mg/L)	DW-23	1.711	n/a	11/18/2024	1.33	No	23	n/a	0	No	0.0007523	Param 1 of 2

Within Limit

### Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.126, Std. Dev.=0.2614, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9053, critical = 0.881. Kappa = 2.238 (c=10, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523.

Constituent: Nickel Analysis Run 2/24/2025 11:45 PM View: 2024AWQR-IntraPL DW23  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

# DW-24 Intrawell Prediction Limit

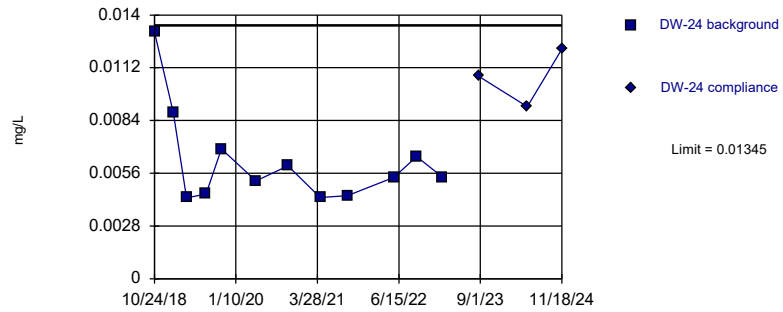
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active Printed 2/24/2025, 11:51 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>Bg Wells</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cadmium (mg/L)	DW-24	0.01345	n/a	11/18/2024	0.0122	No	12	n/a	0	sqrt(x)	0.0006269	Param 1 of 2

Within Limit

### Prediction Limit

Intrawell Parametric



Background Data Summary (based on square root transformation): Mean=0.07775, Std. Dev.=0.01429, n=12.  
Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8091, critical = 0.805. Kappa = 2.676 (c=12, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.0006269.

Constituent: Cadmium Analysis Run 2/24/2025 11:50 PM View: 2024AWQR-IntraPL DW24  
Mahaska County SLF Client: SCS Engineers Data: MCSWM Master Active

## **Mann-Kendall/Sen's Slope Trend Test Summary Table and Graphs**

# Trend Test

Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM Printed 2/25/2025, 12:23 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Alpha</u>	<u>Method</u>
1,1-Dichloroethane (ug/L)	DW-8	0.03996	2	21	No	8	0	0.01	NP
1,4-Dichlorobenzene (ug/L)	UW-10	0.1425	2	21	No	8	0	0.01	NP
Benzene (ug/L)	UW-10	0.1497	9	21	No	8	0	0.01	NP
cis-1,2-Dichloroethene (ug/L)	DW-8	0.06552	4	21	No	8	12.5	0.01	NP
cis-1,2-Dichloroethene (ug/L)	UW-10	-0.1496	-14	-21	No	8	0	0.01	NP
Vinyl Chloride (ug/L)	UW-10	0.004912	3	21	No	8	25	0.01	NP

# Trend Test

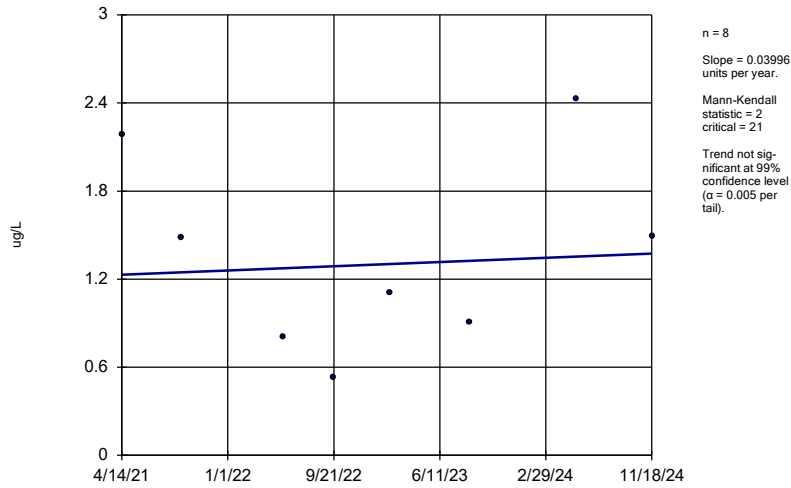
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM Printed 2/25/2025, 12:23 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Alpha</u>	<u>Method</u>
1,1-Dichloroethane (ug/L)	DW-8	0.03996	2	21	No	8	0	0.01	NP
1,4-Dichlorobenzene (ug/L)	UW-10	0.1425	2	21	No	8	0	0.01	NP
Benzene (ug/L)	UW-10	0.1497	9	21	No	8	0	0.01	NP
cis-1,2-Dichloroethene (ug/L)	DW-8	0.06552	4	21	No	8	12.5	0.01	NP
cis-1,2-Dichloroethene (ug/L)	UW-10	-0.1496	-14	-21	No	8	0	0.01	NP
Vinyl Chloride (ug/L)	UW-10	0.004912	3	21	No	8	25	0.01	NP



### Sen's Slope Estimator

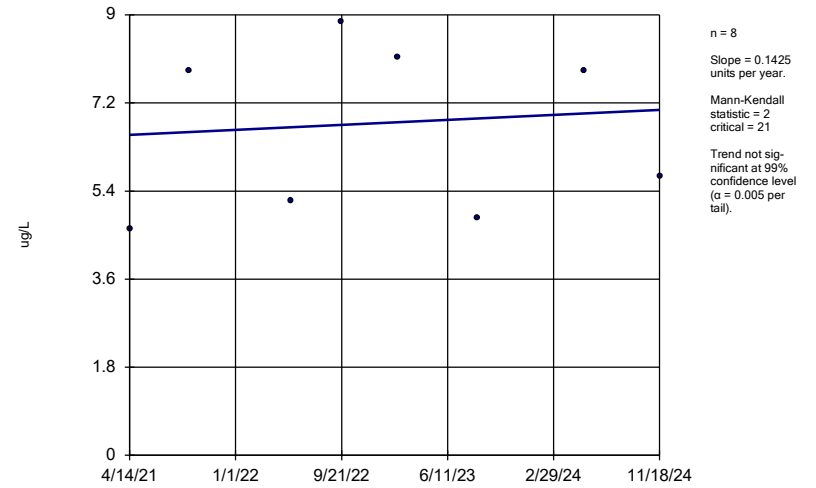
DW-8



Constituent: 1,1-Dichloroethane Analysis Run 2/25/2025 12:20 AM View: 2024AWQR-MannKendall  
 Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Sen's Slope Estimator

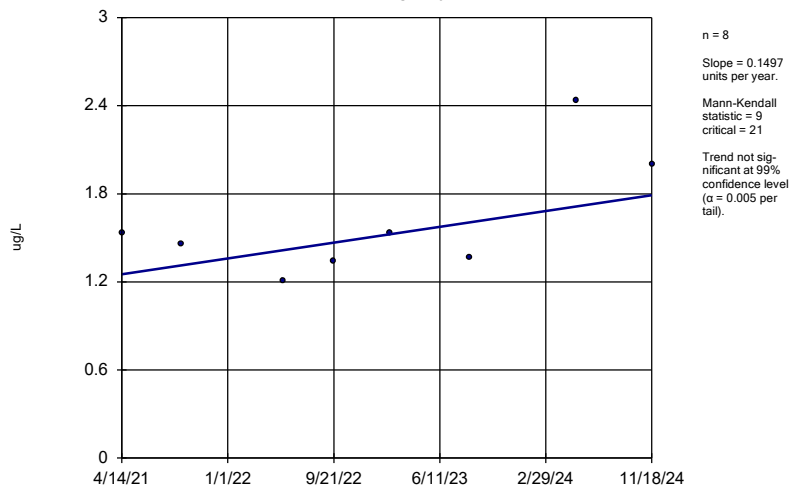
UW-10



Constituent: 1,4-Dichlorobenzene Analysis Run 2/25/2025 12:20 AM View: 2024AWQR-MannKendall  
 Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Sen's Slope Estimator

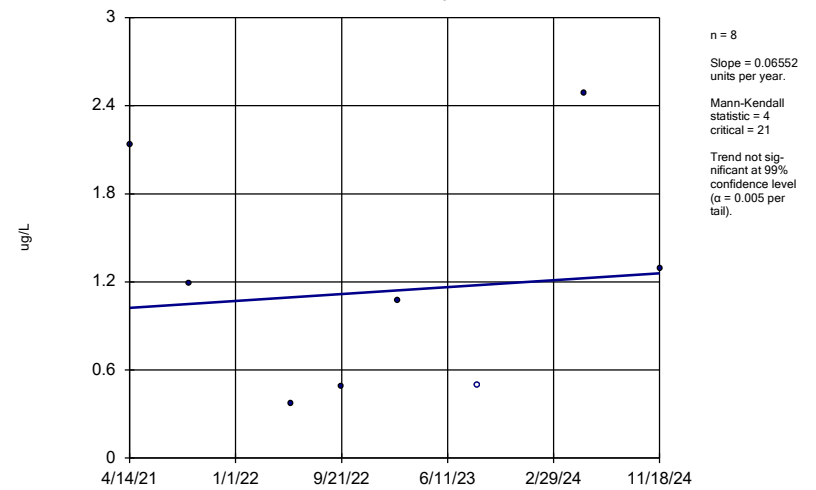
UW-10



Constituent: Benzene Analysis Run 2/25/2025 12:21 AM View: 2024AWQR-MannKendall  
 Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Sen's Slope Estimator

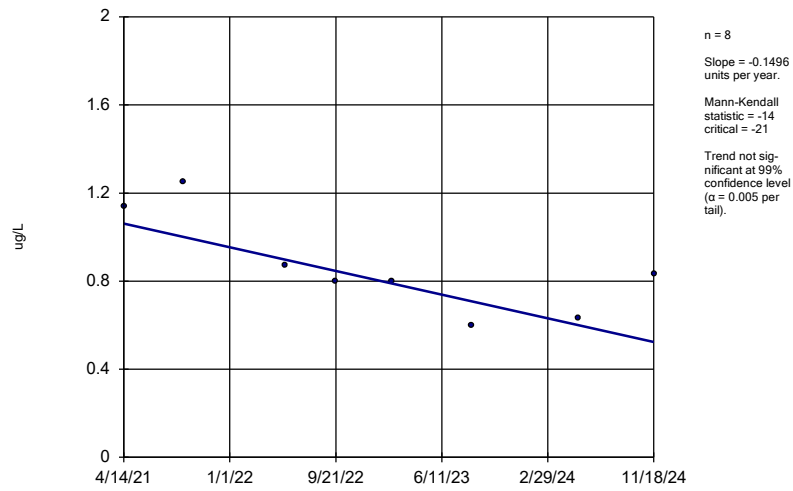
DW-8



Constituent: cis-1,2-Dichloroethene Analysis Run 2/25/2025 12:21 AM View: 2024AWQR-MannKendall  
 Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Sen's Slope Estimator

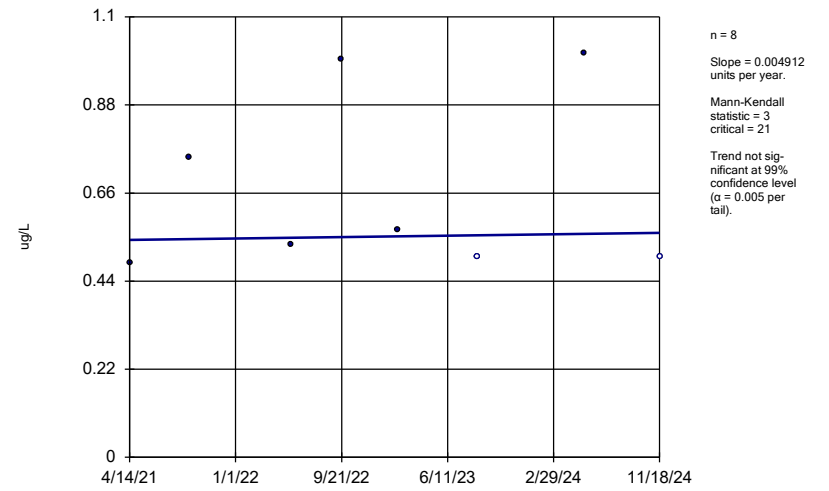
UW-10



Constituent: cis-1,2-Dichloroethene Analysis Run 2/25/2025 12:21 AM View: 2024AWQR-MannKendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Sen's Slope Estimator

UW-10



Constituent: Vinyl Chloride Analysis Run 2/25/2025 12:21 AM View: 2024AWQR-MannKendall  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

## **Confidence Interval Summary Table and Graphs**

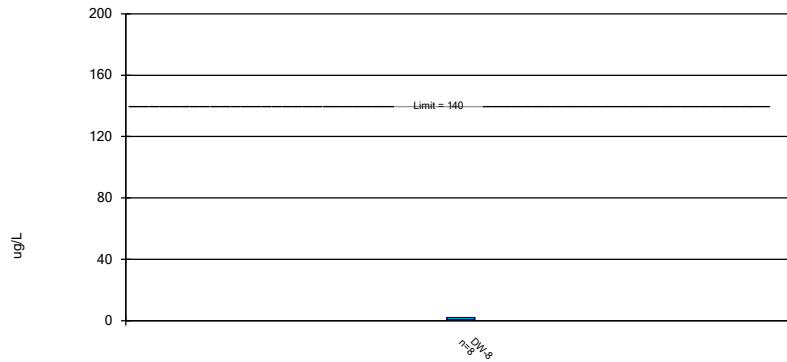
# Confidence Interval

Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM Printed 2/25/2025, 12:36 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
1,1-Dichloroethane (ug/L)	DW-8	2.075	0.6593	140	No	8	0	No	0.01	Param.
1,4-Dichlorobenzene (ug/L)	UW-10	8.442	4.831	75	No	8	0	No	0.01	Param.
Benzene (ug/L)	UW-10	2.043	1.177	5	No	8	0	No	0.01	Param.
cis-1,2-Dichloroethene (ug/L)	DW-8	2.017	0.368	70	No	8	12.5	No	0.01	Param.
cis-1,2-Dichloroethene (ug/L)	UW-10	1.106	0.6264	70	No	8	0	No	0.01	Param.
Vinyl Chloride (ug/L)	UW-10	0.9297	0.4886	2	No	8	25	No	0.01	Param.

### Parametric Confidence Interval

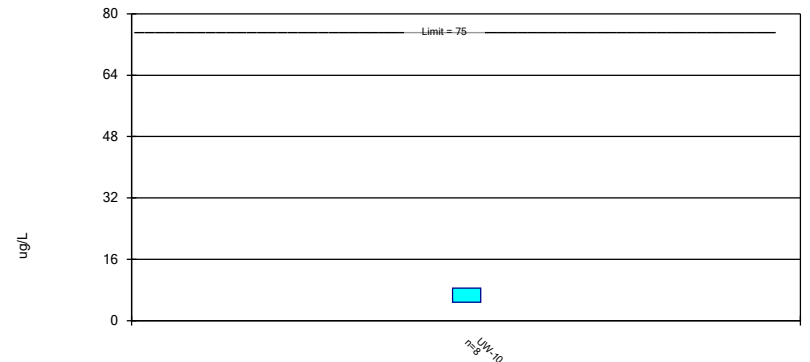
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: 1,1-Dichloroethane Analysis Run 2/25/2025 12:35 AM View: 2024AWQR-ConfidenceInterval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Parametric Confidence Interval

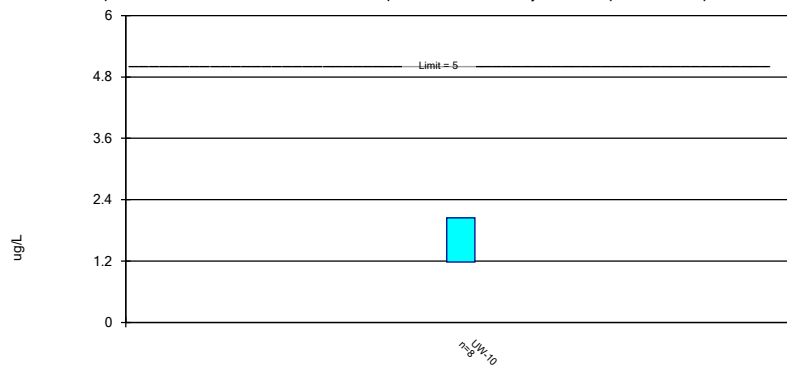
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: 1,4-Dichlorobenzene Analysis Run 2/25/2025 12:35 AM View: 2024AWQR-ConfidenceInterval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Parametric Confidence Interval

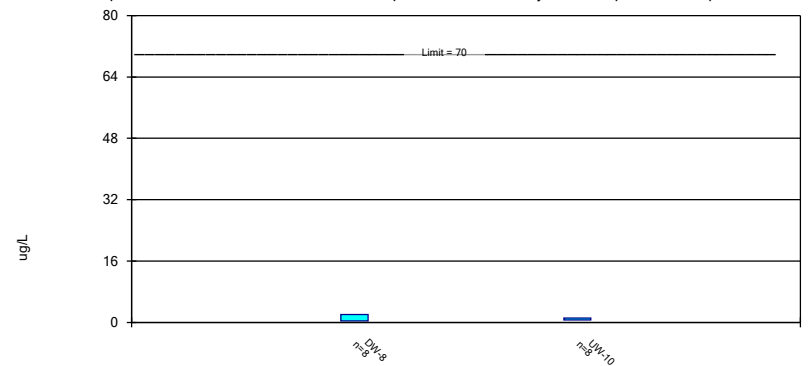
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Benzene Analysis Run 2/25/2025 12:35 AM View: 2024AWQR-ConfidenceInterval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Parametric Confidence Interval

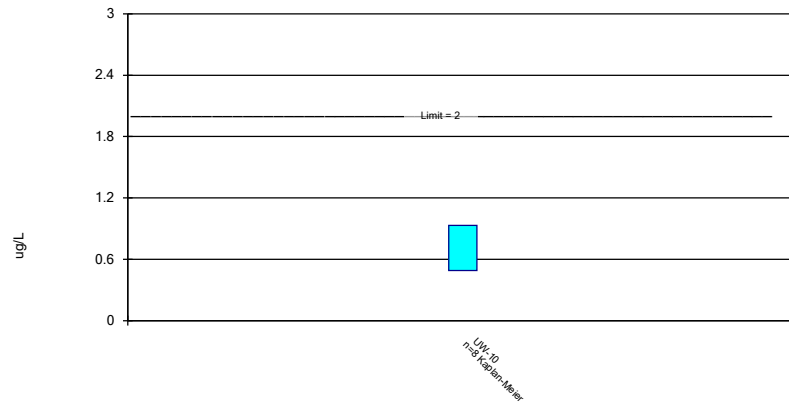
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: cis-1,2-Dichloroethene Analysis Run 2/25/2025 12:35 AM View: 2024AWQR-ConfidenceInterval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

### Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Vinyl Chloride Analysis Run 2/25/2025 12:35 AM View: 2024AWQR-ConfidenceInterval  
Mahaska County SLF Client: SCS Engineers Data: Mahaska-2024AWQR-AM

**Appendix E**  
**2024 Leachate Control System Performance Evaluation Report**

**2024 LEACHATE CONTROL SYSTEM PERFORMANCE EVALUATION REPORT**

**FOR  
MAHASKA COUNTY SANITARY LANDFILL  
BINNS & STEVENS MSWLF UNIT**

**OSKALOOSA, IOWA**

**SUBMITTAL DATE: FEBRUARY 2025**

**PREPARED FOR:  
MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION**

**PREPARED BY:  
SCS ENGINEERS**



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FIGURE 1 LEACHATE CONTROL SYSTEM

### Attachments

ATTACHMENT A LEACHATE MANAGEMENT SUMMARY  
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ATTACHMENT C LEACHATE SAMPLING LABORATORY ANALYTICAL DATA SHEETS

## Section 1.0

# Leachate Control System

SCS Engineers, on behalf of the Mahaska County Solid Waste Management Commission, has prepared this Leachate Control System Performance Evaluation Report (LCSPER) for the Binns & Stevens municipal solid waste landfill (MSWLF) unit at the Mahaska County Sanitary Landfill (Landfill). This LCSPER was prepared in general accordance with the requirements of Iowa Administrative Code (IAC) 567-113.7(5)"b"(14) and additional Iowa Department of Natural Resources (DNR) requirements specified in the Landfill's operating permit and subsequent revisions. This LCSPER describes the leachate control system, discusses maintenance activities, provides an evaluation of the effectiveness of the system, and, if necessary, makes recommendations for additional control measures. The reporting period for this LCSPER is January - December 2024.

### 1.1 Location of Control System

The Landfill property and leachate monitoring points are depicted in Figure 1, Leachate Control System. The Landfill is located approximately five miles south of Oskaloosa, Iowa. The legal description is the NW  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  of Section 12, Township 74N, Range 16W, in Mahaska County, Iowa.

#### 1.1.1 Unlined Area

The leachate monitoring system in the original fill area of the Binns & Stevens MSWLF unit consists of three leachate piezometers (LMEW-7, LMEW-8, and LMEW-9A). The requirement for leachate head is to maintain the lowest practical head over the landfill liner (base of landfill).

#### 1.1.2 Clay Lined Area

The leachate collection system in the Transition Area and Cell 1 consists of a 4-foot compacted clay liner overlain by a 1-foot sand drainage layer. The Transition Area and Cell 1 slope toward collection pipes that convey the leachate to a main header line that gravity drains to the lift station installed in 2023 installed in conjunction with Cell 3 construction, which is then pumped to the leachate storage lagoon. Previously, the main header line gravity drained directly to the leachate storage lagoon. Leachate head monitoring is provided by leachate piezometers LMW-10 and LMW-11R.

#### 1.1.3 Subtitle D Area

The leachate collection system for the Subtitle D-compliant lined Cell 2 consists of a composite liner including a 4-foot layer of compacted soil, overlain with an HDPE liner, and overlain with a sand drainage layer. The Cell 2 liner slopes toward collection pipes that convey leachate to the lift station, which is then pumped to the leachate storage lagoon. Leachate piezometer LMW-12 is located at the low end of Cell 2.

Subtitle D-compliant Cell 3 was constructed in 2024. A lift station constructed near the southeast corner of Cell 3 was designed and constructed to receive flow from Cells 1 and 2 via the existing pipe that previously discharged into the leachate storage lagoon. The Cell 3 leachate collection pipe discharges directly to the lift station via a separate pipe. The north-south pipe from Cells 1 and 2 was connected to the lift station on October 31, 2023. Leachate piezometer LMW-13 is located near the lift station near the southeast corner of Cell 3.

The lift station conveys flow to the existing leachate lagoon via a pump and discharge pipe. The lift station is equipped with a 3"x6" dual wall pipe that allows gravity flow to the lagoon should the leachate pump fail, minimizing the chance of leachate overtopping the lift station.

The current storage consists of a leachate storage lagoon located east of Cell 3. Leachate disposal is performed through recirculation and/or hauling for treatment at the Ottumwa publicly-owned treatment works (POTW).

## 1.2 Effectiveness of the Leachate System

The Leachate Management Summary table in Attachment A provides monthly leachate column thicknesses for the unlined, clay lined, and Subtitle D areas of the Landfill. Attachment B provides a table and graphs of the leachate measurements since January 2016.

### 1.2.1 Unlined Area

Leachate piezometers LMEW-7 and LMEW-8 appear to be damaged. The installed depths are 50 feet below top of casing and 57 feet below top of casing, respectively (Doc #62097). Measured depths are approximately 29.4 feet for LMEW-7 and 43.6 feet for LMEW-8. Leachate has not been measured in leachate piezometers LMEW-7 and LMEW-8 since at least 2016, which indicates that leachate, if present, is below the depth of piezometer damage. However, a leachate column thickness of 4.06 feet was measured in leachate piezometer LMEW-7 in November 2023. Field staff reported that following the initial measurement the electronic water level indicator was cleaned and the measurement verified. Field staff also stated that the probe had a brown residue on it typical of leachate. It is unclear if the November 2023 measurement was anomalous, but the leachate was not encountered during the December 2023 measurement.

The leachate thickness in leachate piezometer LMEW-9A began at a historical low in January 2024, then generally increased through October 2024. A dry measurement was measured in November 2024 followed by an increase to a more typical thickness in December 2024. No previous thickness measurements were below five feet, so the November 2024 measurement is likely not representative.

### 1.2.2 Clay Lined Area

Leachate thickness in leachate piezometer LMW-10 was below the compliance limit throughout his reporting period except for a thickness of 1.9 feet in October 2024. Leachate piezometer LMW-11R was dry throughout the reporting period.

### 1.2.3 Subtitle D Area

Leachate piezometers LMW-12 and LMW-13 were dry and below the compliance limit throughout the reporting period.

## 1.3 Approved Changes to System

There were no approved changes to the leachate control system during this reporting period.

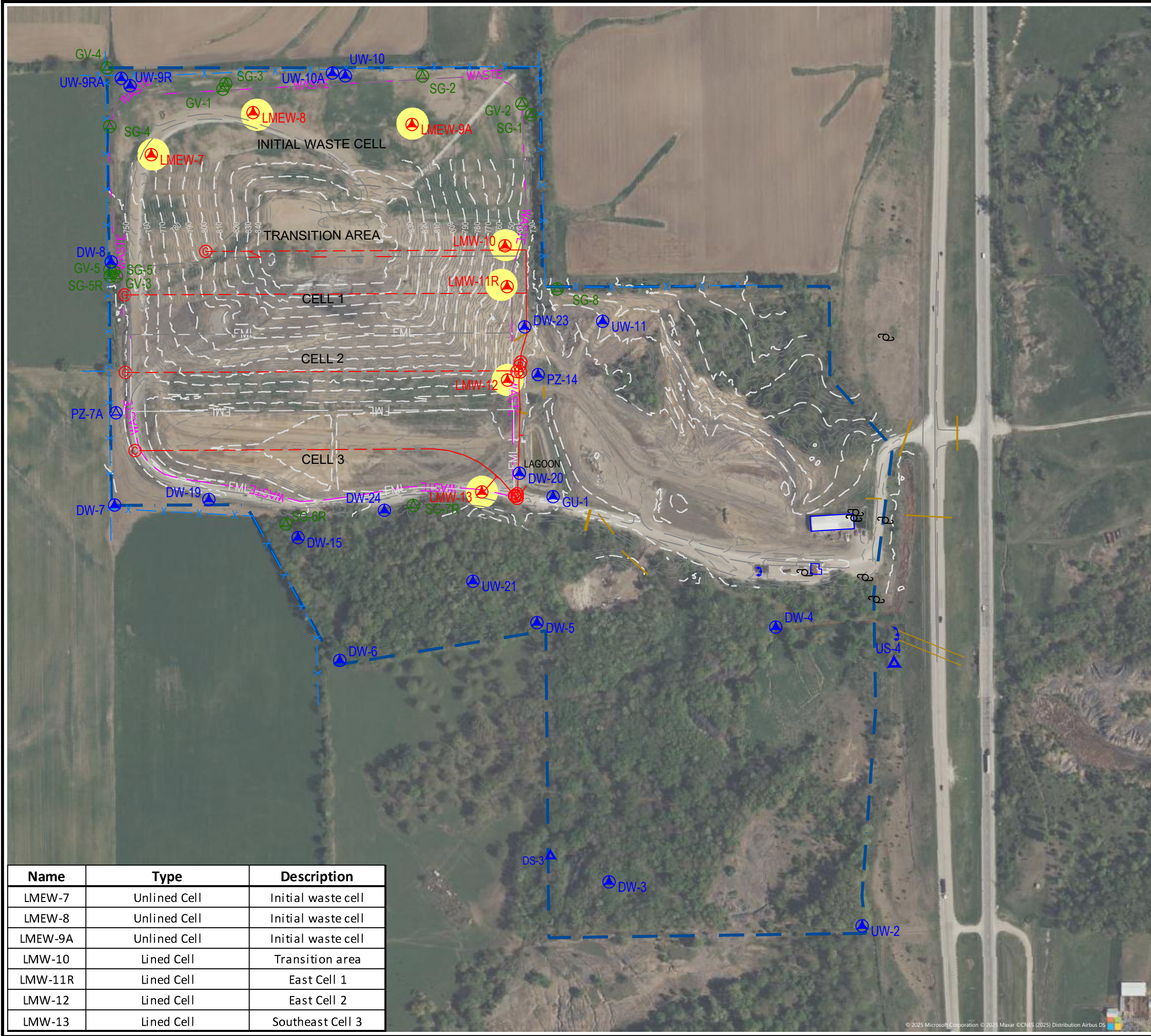
## 1.4 Proposed Changes to System

There are no proposed changes to the leachate control system at this time. SCS recommends continuing to perform the following items to maintain the effectiveness of the leachate control system:

- Continue monthly monitoring of the leachate levels as required in the facility permit.
- Maintain good vegetation over the final cover and intermediate cover over the inactive areas.
- Continue operation and maintenance of the leachate control system in accordance with the approved Leachate Control System Plan.
- Continue recording the volume of leachate disposed of at the City of Ottumwa POTW. 1,380,000 gallons were transported to the POTW for disposal during this reporting period. Leachate testing analytical results are included in Attachment C.

- Continue recording the volume of leachate recirculated. 165,000 gallons were recirculated during this reporting period.
- Continue cleaning the leachate collection system once every three years, or more frequently if leachate head or the volume of leachate collected indicates cleaning is necessary. Cleaning was performed in June 2022 and will be performed next in 2025.

\\DES-FS01\DES\MONIES\PROJECT\27224360\_25\AUTOCAD\MAHASKA 2024\_AWQR\_V0.0.DWG



- LEGEND:**
- EXISTING 2' CONTOUR
  - EXISTING 10' CONTOUR
  - APPROXIMATE EXISTING WASTE BOUNDARY
  - WASTE
  - FML BOUNDARY
  - EXISTING CELL BOUNDARY
  - FUTURE CELL BOUNDARY
  - APPROXIMATE PROPERTY BOUNDARY
  - BUILDING
  - ▬ GRAVEL ROAD
  - ▬ PAVED ROAD
  - FENCELINE
  - X --- CULVERT
  - DW-1 DOWN GRADIENT MONITORING WELL
  - UW-1 UP GRADIENT MONITORING WELL
  - LMEW-1 LEACHATE EXTRACTION WELL
  - LPZ-1 LEACHATE PIEZOMETER
  - LMEW-1 LEACHATE MONITORING LOCATION
  - PZ-1 GROUNDWATER PIEZOMETER
  - GV-1 LANDFILL GAS WELL
  - DS-3 SURFACE WATER SAMPLING POINT
  - POLE

Name	Type	Description
LMEW-7	Unlined Cell	Initial waste cell
LMEW-8	Unlined Cell	Initial waste cell
LMEW-9A	Unlined Cell	Initial waste cell
LMW-10	Lined Cell	Transition area
LMW-11R	Lined Cell	East Cell 1
LMW-12	Lined Cell	East Cell 2
LMW-13	Lined Cell	Southeast Cell 3



	REV.	DATE					
	1	2/27/25					
<b>SHEET TITLE</b>		<b>LEACHATE CONTROL SYSTEM</b>					
<b>CLIENT</b>		MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION 2979 US HIGHWAY 63 OSKALOOSA, IA					
<b>PROJECT TITLE</b>		BINNS AND STEVENS SITE 2024 ANNUAL WATER QUALITY REPORT					
<b>SCS ENGINEERS</b>		1680 ALL STATE COURT, SUITE 100 WEST DES MOINES, IA 50265 PH. (515) 631-6160					
DWG BY:	IAC	DWG BY:	IAC	CHK BY:	NPO	PROJ. MGR:	NPO
CADD FILE:		MAHASKA 2024_AWQR_V0.0.DWG					
DATE:		2/27/25					
DRAWING NO.		<b>1</b>					

**Attachment A**  
**Leachate Management Summary**

**Leachate Management Summary  
2024 Annual Water Quality Report  
Mahaska County Sanitary Landfill - Binns & Stevens Site  
Permit No. 62-SDP-01-74P**

Month	Unlined Cells - Column Thickness (ft)			Lined Cells - Column Thickness (ft)				Volume Recirculated (gal)	Hauled to Ottumwa POTW (gal)	Precipitation (in)
	LMEW-7	LMEW-8	LMEW-9A	LMW-10	LMW-11R	LMW-12	LMW-13			
January 2024	<20.6	<13.4	5.30	0.63	Dry	Dry	Dry	165,000	1,380,000	0.57
February 2024	<20.6	<13.4	NA	NA	Dry	Dry	NA			0.05
March 2024	<20.6	<13.4	7.23	0.60	Dry	Dry	Dry			1.56
April 2024	<20.6	<13.4	8.07	0.82	Dry	Dry	Dry			3.04
May 2024	<20.6	<13.4	8.65	0.75	Dry	Dry	Dry			3.56
June 2024	<20.6	<13.4	8.59	Dry	Dry	Dry	Dry			1.29
July 2024	<20.6	<13.4	10.27	Dry	Dry	Dry	Dry			6.80
August 2024	<20.6	<13.4	9.27	Dry	Dry	Dry	Dry			1.21
September 2024	<20.6	<13.4	8.27	Dry	Dry	Dry	Dry			0.97
October 2024	<20.6	<13.4	11.67	1.90	Dry	Dry	Dry			1.98
November 2024	<20.6	<13.4	Dry	Dry	Dry	Dry	Dry			1.63
December 2024	<20.6	<13.4	7.27	Dry	Dry	Dry	Dry			1.78
<b>Reporting Period Total Gallons</b>							<b>0</b>	<b>165,000</b>	<b>1,380,000</b>	<b>24.44</b>

NA - Not available. As the pumps were not running during the February 2024 measurement event, the head levels were considered not representative.

Comments:

1. Reporting Period: January-December 2024
2. Recommended Changes to Leachate Collection System: None.
3. Maintenance Performed on Leachate Collection System: None.
4. Last Date of Cleaning and Inspection: June 2022.
5. Date for Next Cleaning and Inspection: Leachate line cleaning and inspection will be performed next in 2025.
6. Volume of Leachate Recirculated: 165,000 gallons.
7. Volume of Leachate Treated On-Site: None.
8. Volume of Leachate Treated Off-Site: 1,380,000 gallons.
9. Precipitation data from [https://mesonet.agron.iastate.edu/ASOS/reports/mon\\_prec.php?network=IA\\_ASOS&year=2024](https://mesonet.agron.iastate.edu/ASOS/reports/mon_prec.php?network=IA_ASOS&year=2024).

**Attachment B**

**Historical Leachate Column Thickness Tables and Graphs**



Leachate Column Thickness  
Binns and Stevens MSWLF Unit  
Mahaska County Sanitary Landfill

Date	LMEW-7	LMEW-8	LMEW-9A	LMW-10	LMW-11R	LMW-12	LMW-13
January 2016	0.00	0.00	NI	0.00	0.00	0.00	0.00
February 2016	0.00	0.00	NI	0.00	0.00	0.87	0.87
March 2016	0.00	0.00	NI	0.00	0.00	0.86	0.86
April 2016	0.00	0.00	NI	0.00	0.00	0.00	0.00
May 2016	0.00	0.00	NI	0.00	0.00	0.88	0.88
June 2016	0.00	0.00	NI	0.00	0.00	0.70	0.70
July 2016	0.00	0.00	NI	0.00	0.00	1.08	1.08
August 2016	0.00	0.00	NI	0.00	0.00	0.91	0.91
September 2016	0.00	0.00	NI	0.00	0.00	0.82	0.82
October 2016	0.00	0.00	NI	0.00	0.00	0.92	0.92
November 2016	0.00	0.00	NI	0.00	0.00	NA	NA
December 2016	0.00	0.00	NI	0.00	0.00	NA	NA
January 2017	0.00	0.00	NI	0.00	0.00	NA	NA
February 2017	0.00	0.00	NI	0.00	0.00	NA	NA
March 2017	0.00	0.00	NI	0.00	0.00	NA	NA
April 2017	0.00	0.00	NI	0.00	0.00	NA	NA
May 2017	0.00	0.00	NI	0.00	0.00	0.98	0.98
June 2017	0.00	0.00	NI	0.00	0.00	0.30	0.30
July 2017	0.00	0.00	NI	0.00	0.00	0.00	0.00
August 2017	0.00	0.00	NI	0.00	0.00	0.00	0.00
September 2017	0.00	0.00	NI	0.00	0.00	0.12	0.12
October 2017	0.00	0.00	NI	0.00	0.00	0.99	0.99
November 2017	0.00	0.00	NI	0.00	0.00	0.78	0.78
December 2017	0.00	0.00	NI	0.00	0.00	0.55	0.55
January 2018	0.00	0.00	NI	0.00	0.00	0.76	0.76
February 2018	0.00	0.00	NI	0.00	0.00	0.93	0.93
March 2018	0.00	0.00	NI	0.00	0.00	1.18	1.18
April 2018	0.00	0.00	NI	2.26	0.00	5.15	5.15
May 2018	0.00	0.00	NI	0.00	0.00	5.36	5.36
June 2018	0.00	0.00	NI	3.21	0.00	4.30	4.30
July 2018	0.00	0.00	NI	3.35	1.67	3.69	3.69
August 2018	0.00	0.00	NI	3.40	1.24	3.28	3.28
September 2018	0.00	0.00	NI	3.49	4.18	4.85	4.85
October 2018	0.00	0.00	NI	4.33	3.34	4.38	4.38
November 2018	0.00	0.00	NI	4.22	3.59	4.09	4.09
December 2018	0.00	0.00	NI	4.62	4.40	0.00	0.00
January 2019	0.00	0.00	NI	0.55	0.00	1.95	1.95
February 2019	0.00	0.00	NI	0.61	0.00	2.05	2.05
March 2019	0.00	0.00	NI	0.62	0.00	1.85	1.85
April 2019	0.00	0.00	NI	0.50	0.00	1.03	1.03
May 2019	0.00	0.00	NI	0.53	0.00	NA	NA
June 2019	0.00	NA	NI	0.73	0.00	1.40	1.40
July 2019	0.00	0.00	NI	1.26	0.00	1.35	1.35
August 2019	0.00	0.00	NI	1.19	0.00	1.40	1.40
September 2019	0.00	0.00	NI	0.53	0.00	1.05	1.05
October 2019	0.00	0.00	NI	0.49	0.00	0.90	0.90
November 2019	0.00	0.00	NI	0.46	0.00	0.70	0.70
December 2019	0.00	0.00	NI	0.45	0.00	0.70	0.70
January 2020	0.00	0.00	NI	0.47	0.00	1.00	1.00
February 2020	0.00	0.00	NI	0.30	0.00	0.99	0.99
March 2020	0.00	0.00	NI	0.56	0.00	1.40	1.40
April 2020	0.00	0.00	NI	0.57	0.00	1.12	1.12
May 2020	0.00	0.00	NI	0.45	0.00	0.84	0.84
June 2020	0.00	0.00	NI	0.00	0.00	0.90	0.90
July 2020	0.00	0.00	NI	0.39	0.00	0.85	0.85
August 2020	0.00	0.00	NI	0.00	0.00	0.61	0.61
September 2020	0.00	0.00	7.72	0.36	0.00	0.79	0.79
October 2020	0.00	0.00	8.07	0.00	0.00	1.40	1.40
November 2020	0.00	0.00	8.15	0.37	0.00	1.71	1.71
December 2020	0.00	0.00	7.39	0.52	0.00	2.05	2.05

Leachate Column Thickness  
Binns and Stevens MSWLF Unit  
Mahaska County Sanitary Landfill

Date	LMEW-7	LMEW-8	LMEW-9A	LMW-10	LMW-11R	LMW-12	LMW-13
January 2021	0.00	0.00	5.96	0.48	0.00	2.09	2.09
February 2021	0.00	0.00	6.73	0.84	0.00	2.93	2.93
March 2021	<20.6	<13.4	6.62	0.00	0.00	0.96	0.96
April 2021	<20.6	<13.4	6.41	0.94	0.00	0.76	0.76
May 2021	<20.6	<13.4	6.99	1.08	0.00	0.87	0.87
June 2021	<20.6	<13.4	7.25	1.58	0.00	0.88	0.88
July 2021	<20.6	<13.4	7.45	1.76	0.00	0.94	0.94
August 2021	<20.6	<13.4	6.87	1.97	0.00	0.96	0.96
September 2021	<20.6	<13.4	7.62	1.94	0.00	0.90	0.90
October 2021	<20.6	<13.4	7.27	2.34	0.00	1.06	1.06
November 2021	<20.6	<13.4	7.66	2.51	0.00	1.09	1.09
December 2021	<20.6	<13.4	6.40	0.95	0.00	Dry	Dry
January 2022	<20.6	<13.4	10.48	1.39	0.00	1.01	1.01
February 2022	<20.6	<13.4	7.46	1.21	0.00	1.03	1.03
March 2022	<20.6	<13.4	8.42	1.25	0.00	1.22	1.22
April 2022	<20.6	<13.4	8.46	1.27	0.00	1.49	1.49
May 2022	<20.6	<13.4	7.95	1.04	0.00	1.03	1.03
June 2022	<20.6	<13.4	8.19	0.00	0.00	0.21	0.21
July 2022	<20.6	<13.4	8.16	0.00	0.00	0.00	0.00
August 2022	<20.6	<13.4	14.17	0.00	0.00	0.00	0.00
September 2022	<20.6	<13.4	8.69	0.90	0.00	0.00	0.00
October 2022	<20.6	<13.4	14.13	0.00	0.00	0.00	0.00
November 2022	<20.6	<13.4	6.72	0.95	0.00	0.80	0.80
December 2022	<20.6	<13.4	6.40	0.95	0.00	0.00	0.00
January 2023	<20.6	<13.4	10.48	1.39	0.00	<0.1	<0.1
February 2023	<20.6	<13.4	7.46	1.21	0.00	0.00	0.00
March 2023	<20.6	<13.4	8.42	1.25	0.00	<0.1	<0.1
April 2023	<20.6	<13.4	8.46	1.27	0.00	<0.1	<0.1
May 2023	<20.6	<13.4	7.95	1.04	0.00	0.00	0.00
June 2023	<20.6	<13.4	8.19	0.00	0.00	0.00	0.00
July 2023	<20.6	<13.4	8.16	0.00	0.00	0.00	0.00
August 2023	<20.6	<13.4	14.17	0.00	0.00	0.00	0.00
September 2023	<20.6	<13.4	8.69	0.90	0.00	0.00	0.00
October 2023	<20.6	<13.4	14.13	0.00	0.00	0.00	0.00
November 2023	24.66	<13.4	6.72	0.95	0.00	0.00	0.00
December 2023	<20.6	<13.4	6.72	0.95	0.00	0.00	0.00
January 2024	<20.6	<13.4	5.30	0.63	Dry	Dry	Dry
February 2024	<20.6	<13.4	NA*	NA*	Dry	Dry	NA*
March 2024	<20.6	<13.4	7.23	0.60	Dry	Dry	Dry
April 2024	<20.6	<13.4	8.07	0.82	Dry	Dry	Dry
May 2024	<20.6	<13.4	8.65	0.75	Dry	Dry	Dry
June 2024	<20.6	<13.4	8.59	Dry	Dry	Dry	Dry
July 2024	<20.6	<13.4	10.27	Dry	Dry	Dry	Dry
August 2024	<20.6	<13.4	9.27	Dry	Dry	Dry	Dry
September 2024	<20.6	<13.4	8.27	Dry	Dry	Dry	Dry
October 2024	<20.6	<13.4	11.67	1.90	Dry	Dry	Dry
November 2024	<20.6	<13.4	Dry	Dry	Dry	Dry	Dry
December 2024	<20.6	<13.4	7.27	Dry	Dry	Dry	Dry

NA\* - Not Available. The pumps were off during the February 2024 measurement so the levels were considered not representative.

NI - Not Installed.

NA - Not Available.

Data from January 2016 - February 2021 provided by historical documentation.

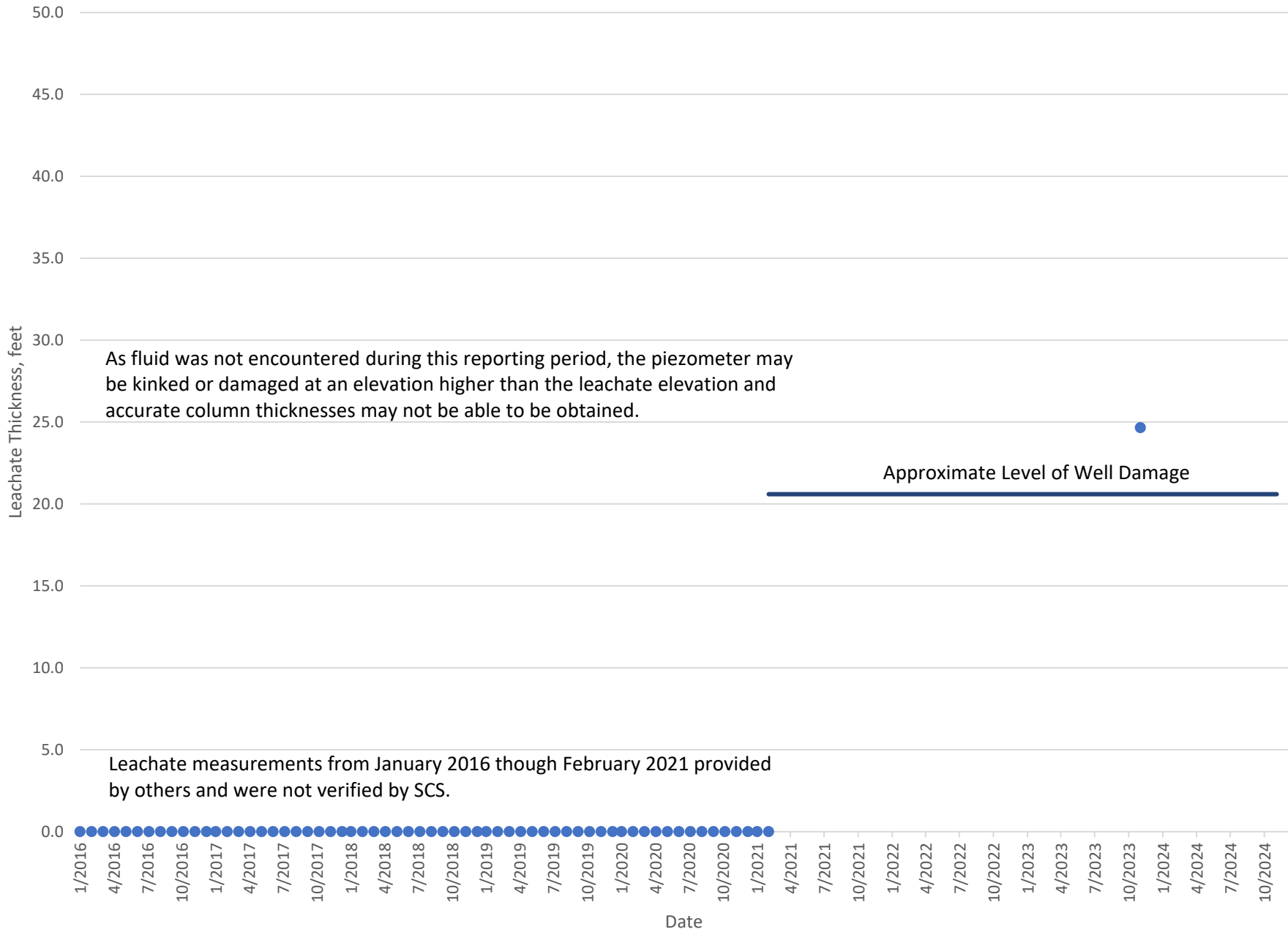
Data from March 2021 through February 2023 measured by Evora Consulting.

Data from March 2023 through June 2024 measured by SCS Engineers.

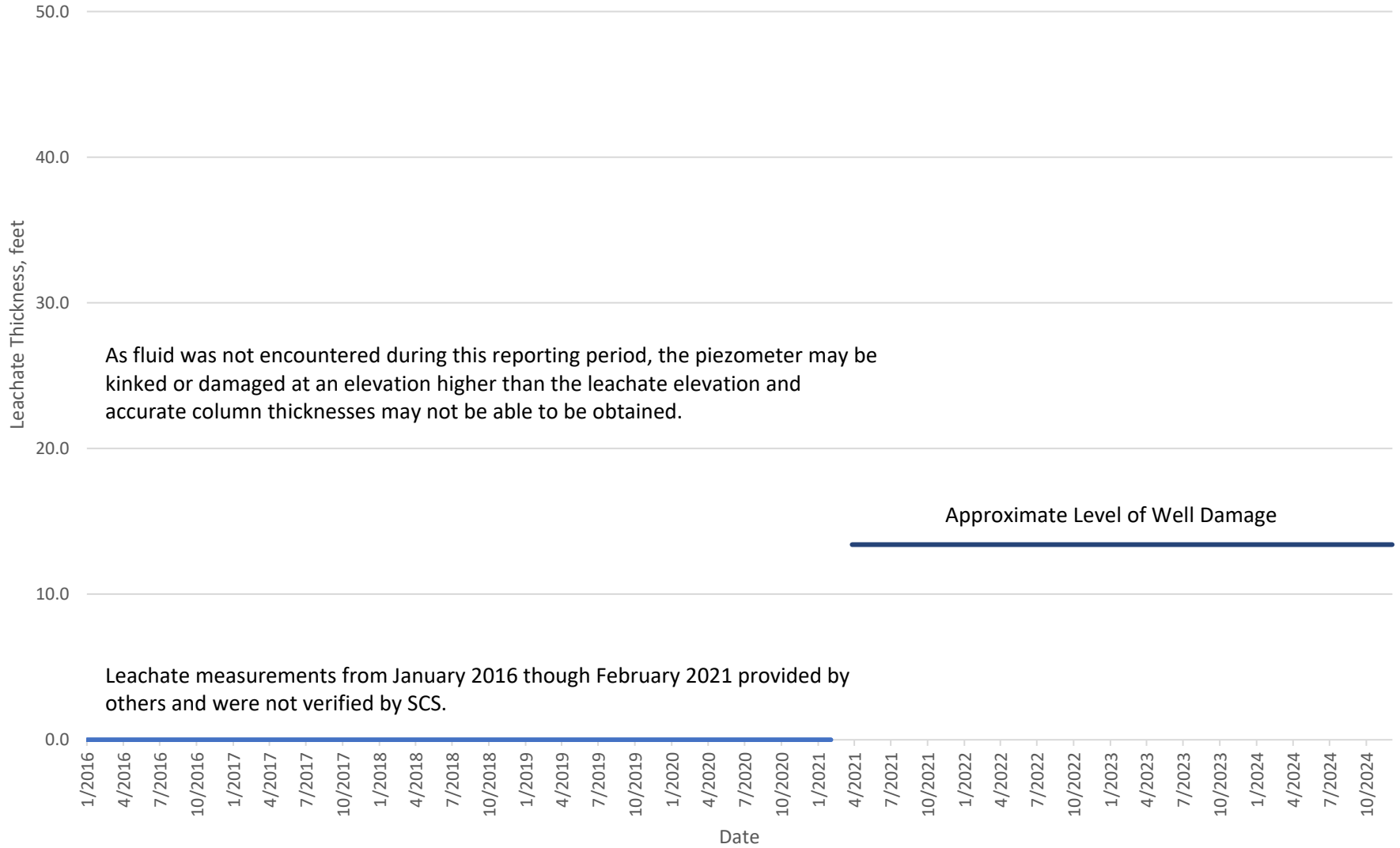
Data from July 2024 through December 2024 measured by facility staff.

March 2021 - June 2022 LMW-12 levels calculated based on construction documentation.

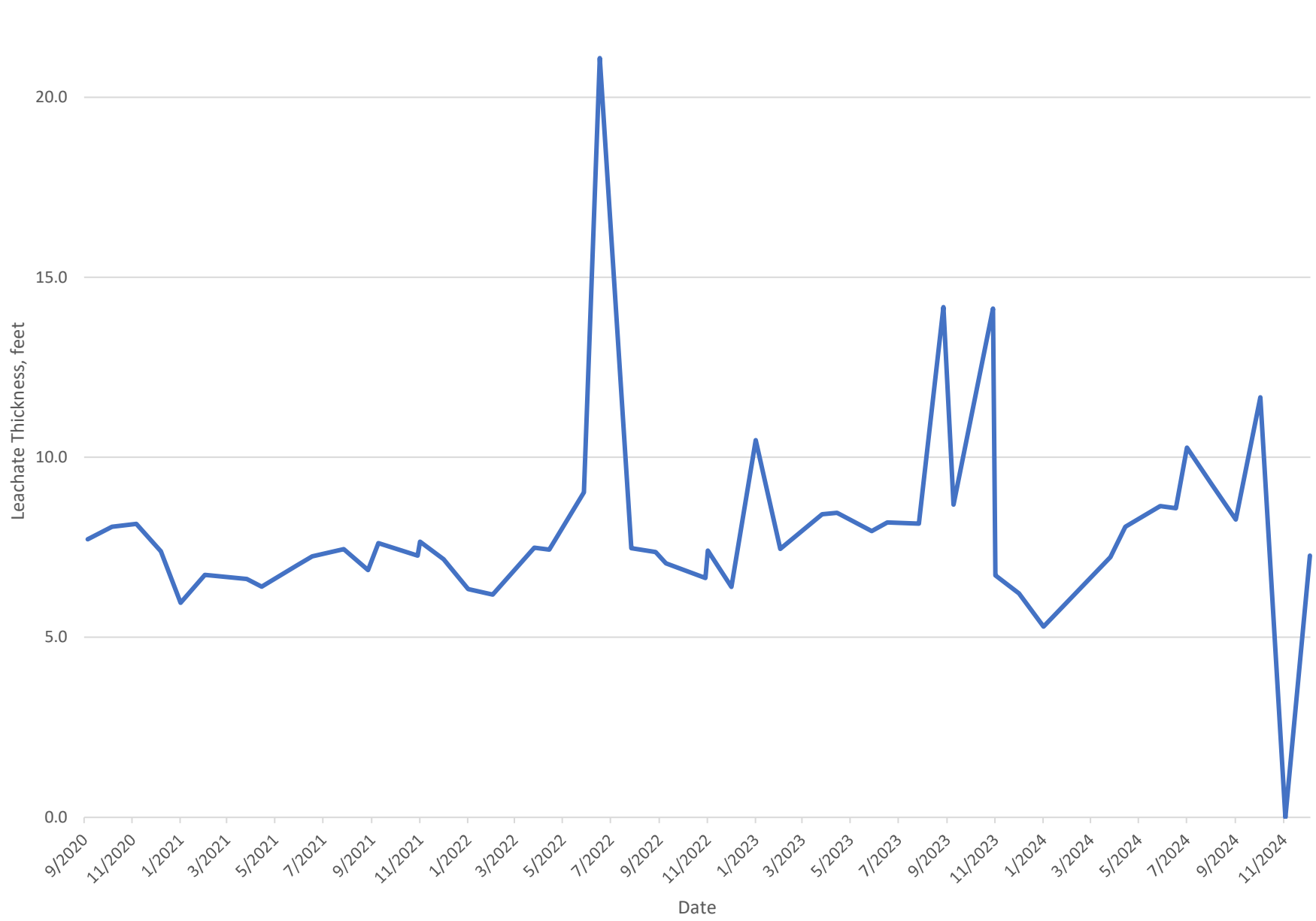
LMEW-7 and LMEW-8 appear to be damaged. See Section 1.3.1 of the narrative.



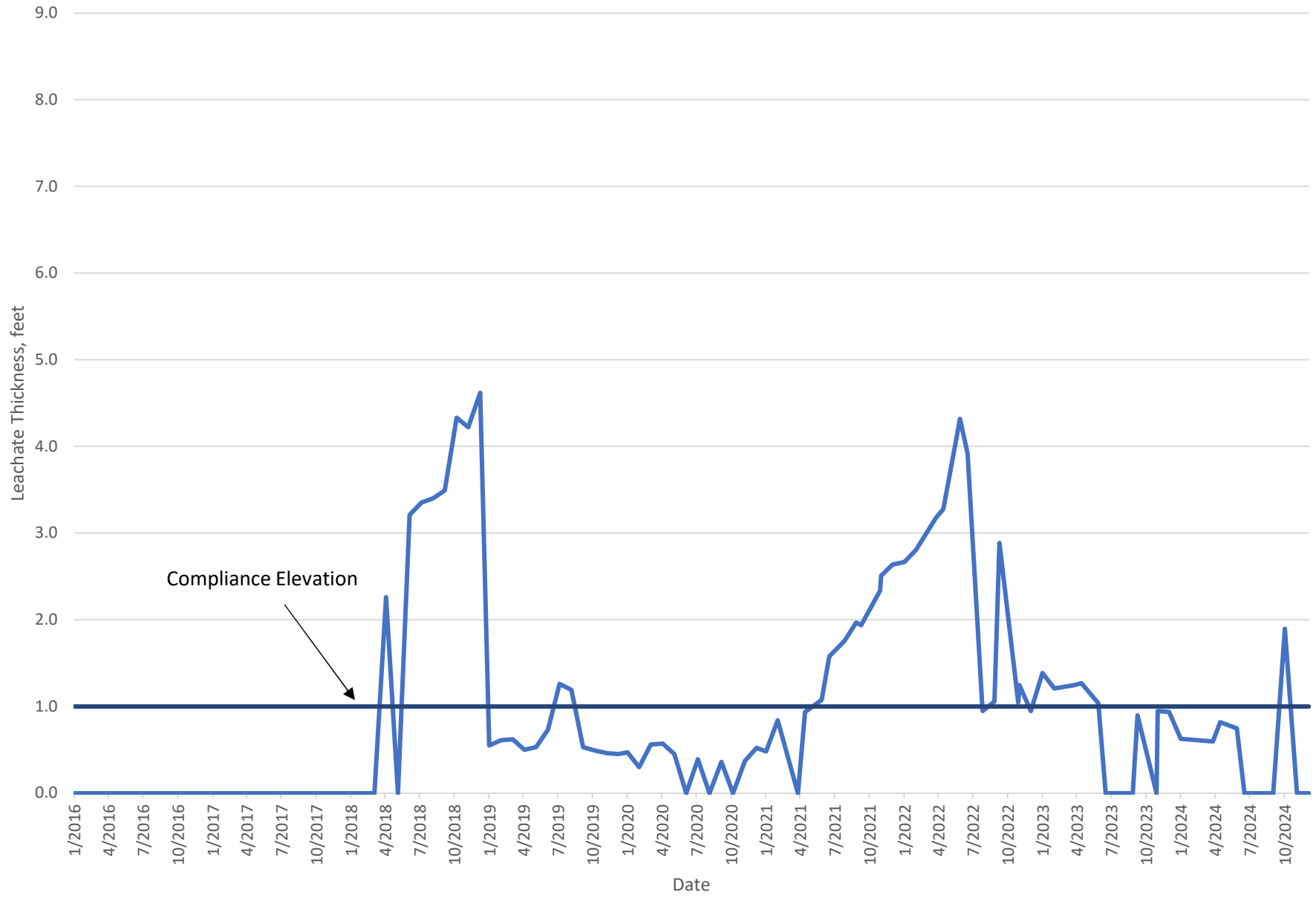
# LMEW-8



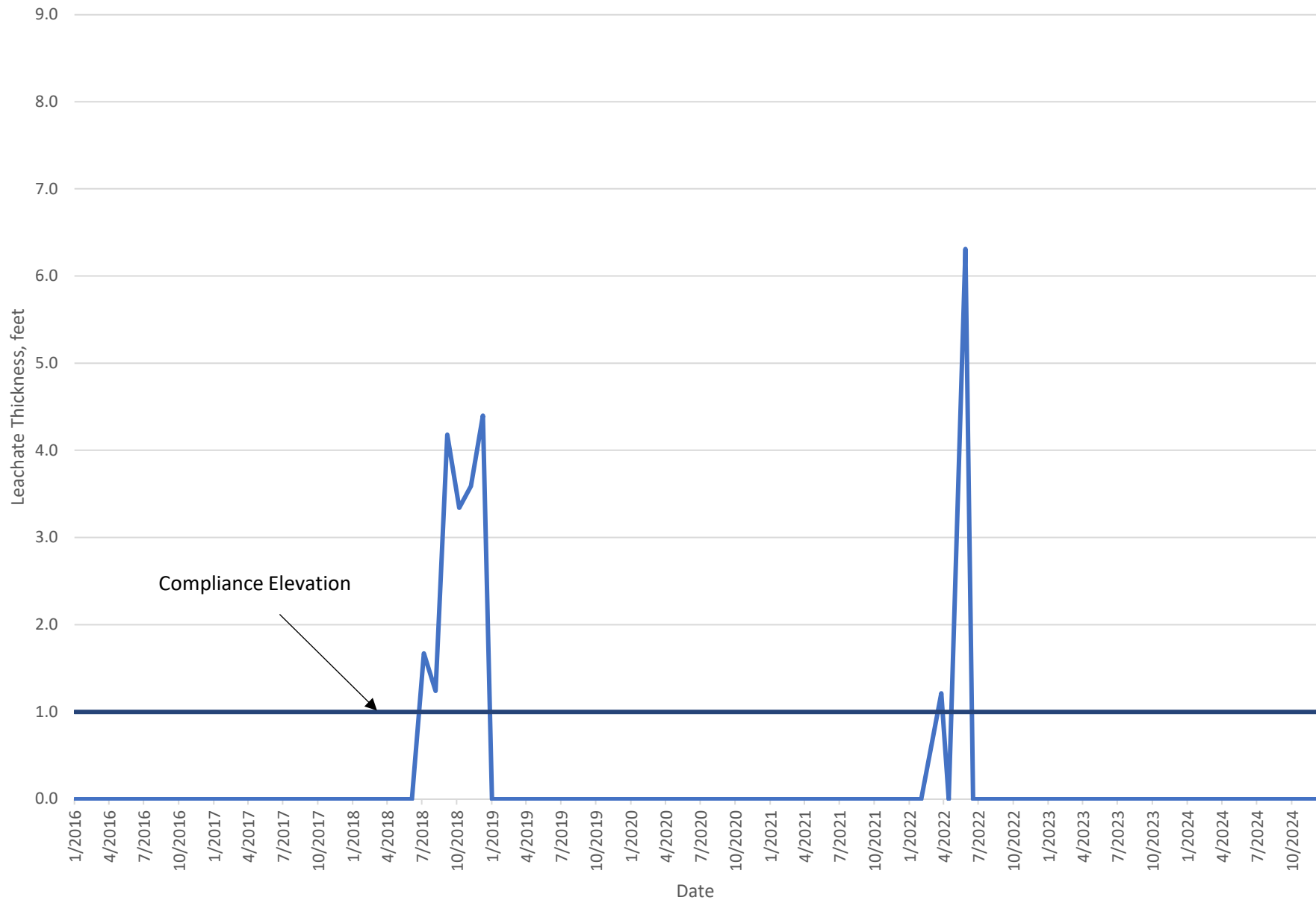
# LMEW-9A



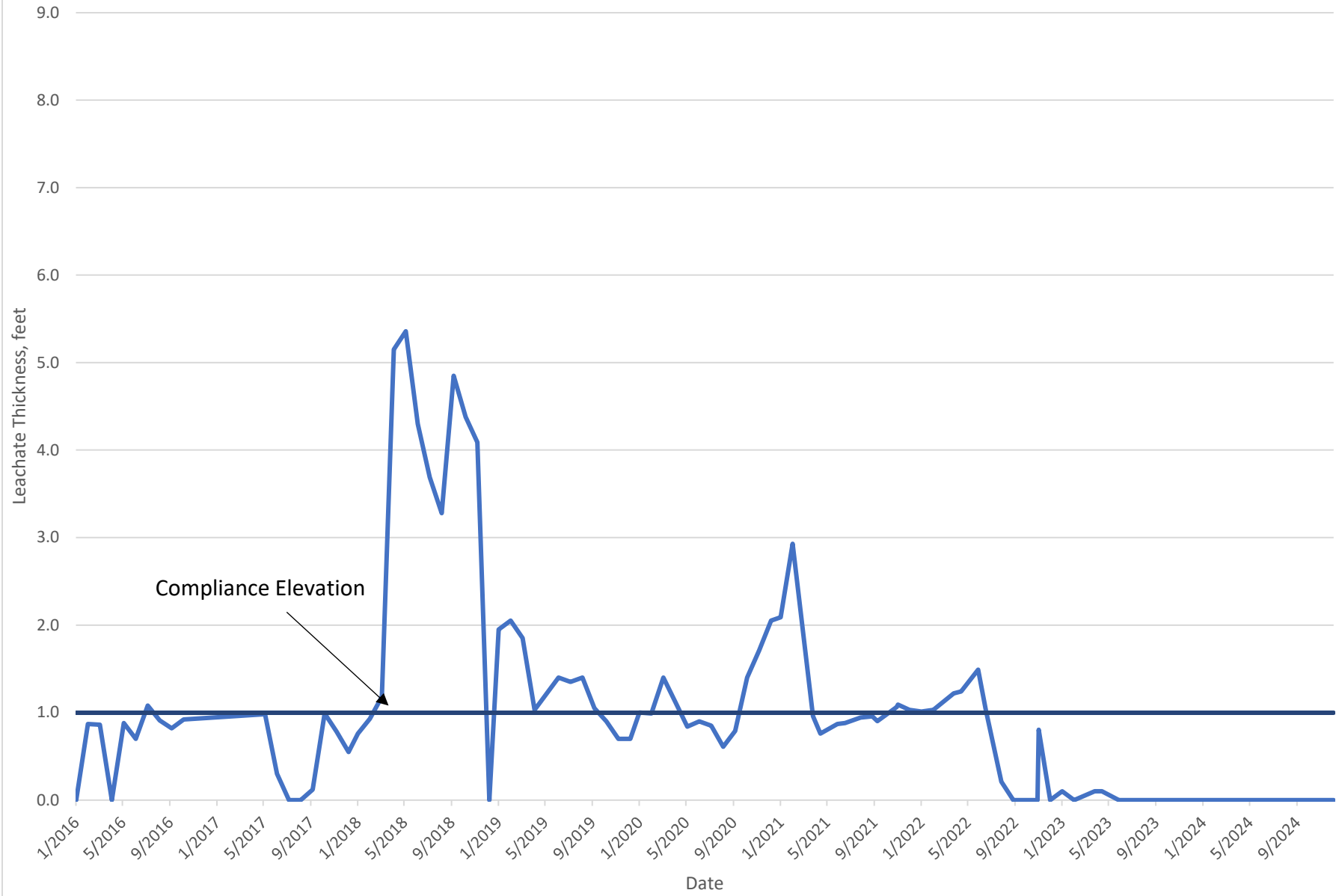
# LMW-10



# LMW-11R

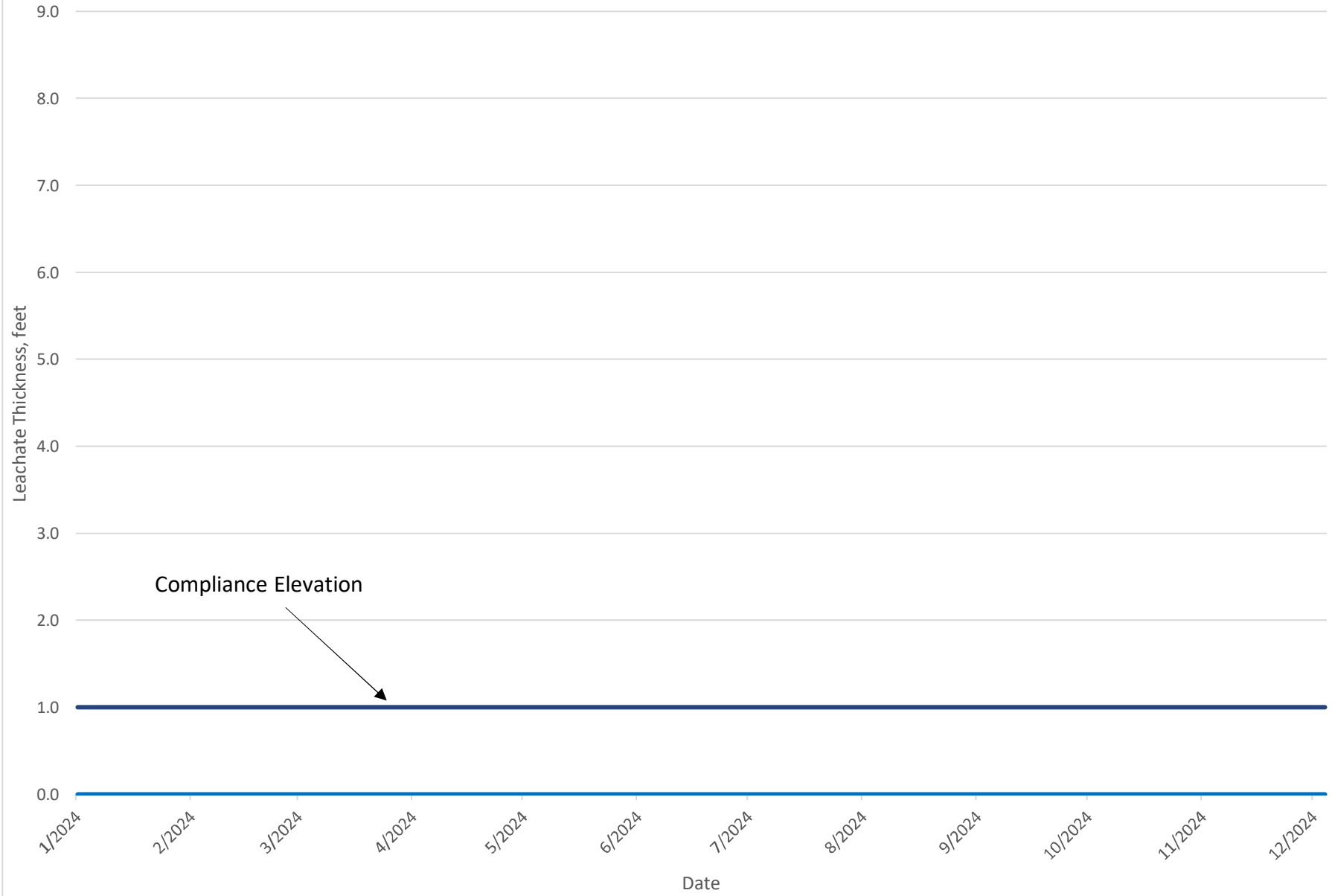


# LMW-12





# LMW-13



**Attachment C**

**Leachate Sampling Laboratory Analytical Data Sheets**

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647


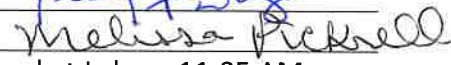
Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF

Sample Date	1/22/2024	Sample Type	Grab
Sampler Start Time	11:05 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	1/22/2024	Time Received at Lab	11:05 AM

*Requested Analyses*

Parameter	Method	Results	Units	Initials/Date
BOD-5	SM 5210 B-2011	72	mg/L	MP 1/24/24
TSS	USGS I-3765-85	120	mg/L	MP 1/23/24
Ammonia	SM 4500 NH3 C	330	mg/L	HZ 1/26/24
pH	SM 4500 H+B	7.41		TRF

Comments:

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647


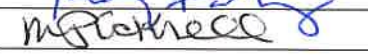
Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF

Sample Date	3/28/2024	Sample Type	Grab
Sampler Start Time	10:48 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	3/28/2024	Time Received at Lab	10:48 AM

*Requested Analyses*

Parameter	Method	Results	Initials/Date
BOD-5	SM 5210 B-2011	7443	mg/L MP 4/4/24
TSS	USGS I-3765-85	940	mg/L MP 3/28/2024
TKN	Eurofins EPA 350.1	487	mg/L ENB7 4/2/24
pH	SM 4500 H+B	6.90	TRF 3/28/2024

Comments:

BOD was analyzed past holding time. Sample volumes used on 3/29/24 depleted too much oxygen, so BOD sample was analyzed again to get a better result than 7356 mg/L.

The seed control did not meet the minimum 2.0 mg/L D.O. depletion for the 4/4/24 BOD analysis. The seed control results were calculated using the highest available depletion

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647



Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF

Sample Date	4/18/2024	Sample Type	Grab
Sampler Start Time	1:15 PM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	4/18/2024	Time Received at Lab	1:15 PM

*Requested Analyses*

Parameter	Method	Results		Initials/Date
BOD-5	SM 5210 B-2011	3642	mg/L	MP 4/19/24
TSS	USGS I-3765-85	280	mg/L	MP 4/22/24
Nitrogen, Ammonia	SM 4500 NH3 C	316	mg/L	H2 4/19/24
pH	SM 4500 H+B	7.18		TRF 4/18/2024

Comments:

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647



Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF

Sample Date	7/30/2024	Sample Type	Grab
Sampler Start Time	8:45 AM	Sampler Finish Time	NA

Sample Collector:	Heather Zuercher	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	7/30/2024	Time Received at Lab	8:45 AM

*Requested Analyses*

Parameter	Method	Results	Initials/Date
BOD-5	SM 5210 B-2011	1588	mg/L MP/HZ 7/31/24
TSS	USGS I-3765-85	96	mg/L MP 7/30/24
TKN	EPA 351.2	166	mg/L ZJx4 8/6/24
pH	SM 4500 H+B	7.28	HZ 7/30/2024

Comments:

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647


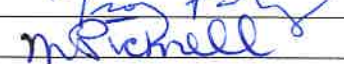
Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF

Sample Date	8/9/2024	Sample Type	Grab
Sampler Start Time	9:30 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	8/9/2024	Time Received at Lab	9:30 AM

*Requested Analyses*

Parameter	Method	Results	Units	Initials/Date
BOD-5	SM 5210 B-2011	940	mg/L	MP 8/9/24
TSS	USGS I-3765-85	120	mg/L	HZ 8/12/24
TKN	EPA 351.2	28.9	mg/L	ZJX4 8/19/24
pH	SM 4500 H+B	6.73		TRF 8/9/2024

Comments:

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647



Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF with Leachate

Sample Date	10/2/2024	Sample Type	Grab
Sampler Start Time	10:28 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	10/2/2024	Time Received at Lab	10:28 AM

*Requested Analyses*

Parameter	Method	Results	Initials/Date
BOD-5	SM 5210 B-2011	4805	mg/L MP 10/3/24
TSS	USGS I-3765-85	680	mg/L MP 10/2/24
TKN	EPA 351.2	585	mg/L ZJX4 10/8/24
pH	SM 4500 H+B	7.4	TRF 10/2/2024

Comments: See attached report for metals, oil & grease, total N, total P, and cyanide.



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Troy Fadiga  
Ottumwa WWTP  
2222 S. Emma  
Ottumwa, Iowa 52501

Generated 10/16/2024 1:13:57 PM

## JOB DESCRIPTION

Analytical Testing

## JOB NUMBER

310-292060-1

# Eurofins Cedar Falls

1

## Job Notes

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## Authorization



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10/16/2024 1:13:57 PM

Authorized for release by  
Hannah Dietz, Project Manager I  
[Hannah.Dietz@et.eurofinsus.com](mailto:Hannah.Dietz@et.eurofinsus.com)  
(319)277-2401



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# Case Narrative

Client: Ottumwa WWTP  
Project: Analytical Testing

Job ID: 310-292060-1

Job ID: 310-292060-1

Eurofins Cedar Falls

## Job Narrative 310-292060-1

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 sample was received on 10/4/2024 12:01 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.8°C.

### HPLC/IC

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

### Metals

Method 200.7\_CWA: Due to the difficult matrix, only 10 mL was used for digestion.

Leachate (310-292060-1)

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

### General Chemistry

Method 353.2: The following sample was diluted due to the nature of the sample matrix: Leachate (310-292060-1). 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.

Eurofins Cedar Falls

## Sample Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-292060-1	Leachate	Water	10/02/24 10:28	10/04/24 12:01



# Detection Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

Client Sample ID: Leachate

Lab Sample ID: 310-292060-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	1800		20.0		mg/L	20			300.0	Total/NA
HEM (Oil & Grease)	111		5.6		mg/L	1			1664A	Total/NA
Nitrogen, Kjeldahl	585		50.0		mg/L	10			351.2	Total/NA
Total Phosphorus as P	1.99		0.100		mg/L	1			365.1	Total/NA
Nitrogen, Total	585		50.0		mg/L	1			Total Nitrogen	Total/NA



This Detection Summary does not include radiochemical test results.

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## Client Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

**Client Sample ID: Leachate**

**Lab Sample ID: 310-292060-1**

Date Collected: 10/02/24 10:28

Matrix: Water

Date Received: 10/04/24 12:01

### Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1800		20.0		mg/L			10/09/24 20:58	20
Sulfate	<5.00		5.00		mg/L			10/11/24 20:10	5

### Method: EPA 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 11:25	1
Copper	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 11:25	1
Selenium	<0.500		0.500		mg/L		10/10/24 09:30	10/16/24 11:25	1
Zinc	<0.200		0.200		mg/L		10/10/24 09:30	10/16/24 11:25	1
Arsenic	<0.400		0.400		mg/L		10/10/24 09:30	10/16/24 11:25	1
Cadmium	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 11:25	1
Molybdenum	<0.250		0.250		mg/L		10/10/24 09:30	10/16/24 11:25	1
Nickel	<0.250		0.250		mg/L		10/10/24 09:30	10/16/24 11:25	1
Silver	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 11:25	1
Lead	<0.500		0.500		mg/L		10/10/24 09:30	10/16/24 11:25	1

### Method: EPA 245.2 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/12/24 10:55	10/14/24 12:40	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease) (1664A)	111		5.6		mg/L		10/10/24 12:51	10/10/24 12:51	1
Cyanide, Total (EPA 335.4)	<0.0100		0.0100		mg/L		10/08/24 09:30	10/10/24 16:58	1
Nitrogen, Kjeldahl (EPA 351.2)	585		50.0		mg/L		10/08/24 05:21	10/08/24 18:54	10
Nitrate Nitrite as N (EPA 353.2)	<1.00		1.00		mg/L			10/10/24 12:44	10
Total Phosphorus as P (EPA 365.1)	1.99		0.100		mg/L		10/09/24 09:29	10/09/24 21:09	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrogen, Total (EPA Total Nitrogen)	585		50.0		mg/L			10/10/24 12:44	1

## Definitions/Glossary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### 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



## QC Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 310-435976/3  
Matrix: Water  
Analysis Batch: 435976

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	<1.00		1.00		mg/L			10/09/24 18:17	1
Sulfate	<1.00		1.00		mg/L			10/09/24 18:17	1

Lab Sample ID: LCS 310-435976/4  
Matrix: Water  
Analysis Batch: 435976

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	10.0	10.03		mg/L		100	90 - 110
Sulfate	10.0	10.27		mg/L		103	90 - 110

Lab Sample ID: MB 310-436061/3  
Matrix: Water  
Analysis Batch: 436061

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	<1.00		1.00		mg/L			10/11/24 18:21	1
Sulfate	<1.00		1.00		mg/L			10/11/24 18:21	1

Lab Sample ID: LCS 310-436061/4  
Matrix: Water  
Analysis Batch: 436061

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	10.0	9.392		mg/L		94	90 - 110
Sulfate	10.0	9.953		mg/L		100	90 - 110

### Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 310-435730/1-A  
Matrix: Water  
Analysis Batch: 436461

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 435730

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chromium	<0.0200		0.0200		mg/L		10/10/24 09:30	10/16/24 10:56	1
Copper	<0.0200		0.0200		mg/L		10/10/24 09:30	10/16/24 10:56	1
Selenium	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 10:56	1
Zinc	<0.0400		0.0400		mg/L		10/10/24 09:30	10/16/24 10:56	1
Arsenic	<0.0800		0.0800		mg/L		10/10/24 09:30	10/16/24 10:56	1
Cadmium	<0.0200		0.0200		mg/L		10/10/24 09:30	10/16/24 10:56	1
Molybdenum	<0.0500		0.0500		mg/L		10/10/24 09:30	10/16/24 10:56	1
Nickel	<0.0500		0.0500		mg/L		10/10/24 09:30	10/16/24 10:56	1
Silver	<0.0200		0.0200		mg/L		10/10/24 09:30	10/16/24 10:56	1
Lead	<0.100		0.100		mg/L		10/10/24 09:30	10/16/24 10:56	1

Eurofins Cedar Falls

## QC Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: LCS 310-435730/2-A  
Matrix: Water  
Analysis Batch: 436461

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 435730

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Chromium	1.00	0.9570		mg/L		96	85 - 115	
Copper	2.00	1.903		mg/L		95	85 - 115	
Selenium	4.00	3.896		mg/L		97	85 - 115	
Zinc	2.00	1.915		mg/L		96	85 - 115	
Arsenic	2.00	1.994		mg/L		100	85 - 115	
Cadmium	1.00	0.9502		mg/L		95	85 - 115	
Molybdenum	2.00	1.923		mg/L		96	85 - 115	
Nickel	2.00	1.903		mg/L		95	85 - 115	
Silver	0.100	0.1025		mg/L		103	85 - 115	
Lead	2.00	1.878		mg/L		94	85 - 115	

### Method: 245.2 - Mercury (CVAA)

Lab Sample ID: MB 310-436040/1-A  
Matrix: Water  
Analysis Batch: 436171

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 436040

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200		mg/L		10/12/24 10:55	10/14/24 11:35	1

Lab Sample ID: LCS 310-436040/2-A  
Matrix: Water  
Analysis Batch: 436171

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 436040

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Mercury	0.00167	0.001803		mg/L		108	85 - 115	

### Method: 1664A - HEM and SGT-HEM

Lab Sample ID: MB 310-435847/1-A  
Matrix: Water  
Analysis Batch: 435954

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 435847

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
HEM (Oil & Grease)	<5.0		5.0		mg/L		10/10/24 12:51	10/10/24 12:51	1

Lab Sample ID: LCS 310-435847/2-A  
Matrix: Water  
Analysis Batch: 435954

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 435847

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
HEM (Oil & Grease)	40.0	35.50		mg/L		89	78 - 114	

Eurofins Cedar Falls

## QC Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 310-435520/1-A  
Matrix: Water  
Analysis Batch: 435882

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 435520

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Cyanide, Total	<0.0100		0.0100		mg/L		10/08/24 09:30	10/10/24 16:54	1

Lab Sample ID: LCS 310-435520/2-A  
Matrix: Water  
Analysis Batch: 435882

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 435520

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Cyanide, Total	0.200	0.1911		mg/L		96	90 - 110

### Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 310-435468/1-A  
Matrix: Water  
Analysis Batch: 435595

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 435468

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Nitrogen, Kjeldahl	<1.00		1.00		mg/L		10/08/24 05:21	10/08/24 18:17	1

Lab Sample ID: LCS 310-435468/2-A  
Matrix: Water  
Analysis Batch: 435595

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 435468

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Nitrogen, Kjeldahl	4.01	3.790		mg/L		95	90 - 110

### Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 310-435860/16  
Matrix: Water  
Analysis Batch: 435860

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Nitrate Nitrite as N	<0.100		0.100		mg/L			10/10/24 10:21	1

Lab Sample ID: LCS 310-435860/17  
Matrix: Water  
Analysis Batch: 435860

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Nitrate Nitrite as N	2.07	1.927		mg/L		93	90 - 110

### Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 310-435644/1-A  
Matrix: Water  
Analysis Batch: 435744

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 435644

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Phosphorus as P	<0.100		0.100		mg/L		10/09/24 09:29	10/09/24 20:59	1

Eurofins Cedar Falls

# QC Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

## Method: 365.1 - Phosphorus, Total (Continued)

Lab Sample ID: LCS 310-435644/2-A  
Matrix: Water  
Analysis Batch: 435744

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 435644

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Phosphorus as P	1.00	0.9845		mg/L		98	90 - 110



## QC Association Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### HPLC/IC

#### Analysis Batch: 435976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	300.0	
MB 310-435976/3	Method Blank	Total/NA	Water	300.0	
LCS 310-435976/4	Lab Control Sample	Total/NA	Water	300.0	

#### Analysis Batch: 436061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	300.0	
MB 310-436061/3	Method Blank	Total/NA	Water	300.0	
LCS 310-436061/4	Lab Control Sample	Total/NA	Water	300.0	

### Metals

#### Prep Batch: 435730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	200.7	
MB 310-435730/1-A	Method Blank	Total/NA	Water	200.7	
LCS 310-435730/2-A	Lab Control Sample	Total/NA	Water	200.7	

#### Prep Batch: 436040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	245.1	
MB 310-436040/1-A	Method Blank	Total/NA	Water	245.1	
LCS 310-436040/2-A	Lab Control Sample	Total/NA	Water	245.1	

#### Analysis Batch: 436171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	245.2	436040
MB 310-436040/1-A	Method Blank	Total/NA	Water	245.2	436040
LCS 310-436040/2-A	Lab Control Sample	Total/NA	Water	245.2	436040

#### Analysis Batch: 436461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	200.7 Rev 4.4	435730
MB 310-435730/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	435730
LCS 310-435730/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	435730

### General Chemistry

#### Analysis Batch: 435397

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	Total Nitrogen	

#### Prep Batch: 435468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	351.2	
MB 310-435468/1-A	Method Blank	Total/NA	Water	351.2	
LCS 310-435468/2-A	Lab Control Sample	Total/NA	Water	351.2	

#### Prep Batch: 435520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	Distill/CN	
MB 310-435520/1-A	Method Blank	Total/NA	Water	Distill/CN	

Eurofins Cedar Falls

# QC Association Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

## General Chemistry (Continued)

### Prep Batch: 435520 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-435520/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	

### Analysis Batch: 435595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	351.2	435468
MB 310-435468/1-A	Method Blank	Total/NA	Water	351.2	435468
LCS 310-435468/2-A	Lab Control Sample	Total/NA	Water	351.2	435468

### Prep Batch: 435644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	365.2/365.3/365	
MB 310-435644/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 310-435644/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	

### Analysis Batch: 435744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	365.1	435644
MB 310-435644/1-A	Method Blank	Total/NA	Water	365.1	435644
LCS 310-435644/2-A	Lab Control Sample	Total/NA	Water	365.1	435644

### Prep Batch: 435847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	1664A	
MB 310-435847/1-A	Method Blank	Total/NA	Water	1664A	
LCS 310-435847/2-A	Lab Control Sample	Total/NA	Water	1664A	

### Analysis Batch: 435860

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	353.2	
MB 310-435860/16	Method Blank	Total/NA	Water	353.2	
LCS 310-435860/17	Lab Control Sample	Total/NA	Water	353.2	

### Analysis Batch: 435882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	335.4	435520
MB 310-435520/1-A	Method Blank	Total/NA	Water	335.4	435520
LCS 310-435520/2-A	Lab Control Sample	Total/NA	Water	335.4	435520

### Analysis Batch: 435954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292060-1	Leachate	Total/NA	Water	1664A	435847
MB 310-435847/1-A	Method Blank	Total/NA	Water	1664A	435847
LCS 310-435847/2-A	Lab Control Sample	Total/NA	Water	1664A	435847

## Lab Chronicle

Client: Ottumwa WWTP  
 Project/Site: Analytical Testing

Job ID: 310-292060-1

**Client Sample ID: Leachate**

**Lab Sample ID: 310-292060-1**

Date Collected: 10/02/24 10:28

Matrix: Water

Date Received: 10/04/24 12:01

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		5	436061	HE7K	EET CF	10/11/24 20:10
Total/NA	Analysis	300.0		20	435976	HE7K	EET CF	10/09/24 20:58
Total/NA	Prep	200.7			435730	F5MW	EET CF	10/10/24 09:30
Total/NA	Analysis	200.7 Rev 4.4		1	436461	ZRI4	EET CF	10/16/24 11:25
Total/NA	Prep	245.1			436040	QTZ5	EET CF	10/12/24 10:55
Total/NA	Analysis	245.2		1	436171	QTZ5	EET CF	10/14/24 12:40
Total/NA	Prep	1664A			435847	DGU1	EET CF	10/10/24 12:51
Total/NA	Analysis	1664A		1	435954	DGU1	EET CF	10/10/24 12:51
Total/NA	Prep	Distill/CN			435520	ENB7	EET CF	10/08/24 09:30
Total/NA	Analysis	335.4		1	435882	ZJX4	EET CF	10/10/24 16:58
Total/NA	Prep	351.2			435468	W9YR	EET CF	10/08/24 05:21
Total/NA	Analysis	351.2		10	435595	ZJX4	EET CF	10/08/24 18:54
Total/NA	Analysis	353.2		10	435860	ENB7	EET CF	10/10/24 12:44
Total/NA	Prep	365.2/365.3/365			435644	A3GU	EET CF	10/09/24 09:29
Total/NA	Analysis	365.1		1	435744	ZJX4	EET CF	10/09/24 21:09
Total/NA	Analysis	Total Nitrogen		1	435397	HE7K	EET CF	10/10/24 12:44

**Laboratory References:**

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

## Accreditation/Certification Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

### Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

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

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Total Nitrogen		Water	Nitrogen, Total





## Method Summary

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-292060-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	EPA	EET CF
200.7 Rev 4.4	Metals (ICP)	EPA	EET CF
245.2	Mercury (CVAA)	EPA	EET CF
1664A	HEM and SGT-HEM	1664A	EET CF
335.4	Cyanide, Total	EPA	EET CF
351.2	Nitrogen, Total Kjeldahl	EPA	EET CF
353.2	Nitrogen, Nitrate-Nitrite	EPA	EET CF
365.1	Phosphorus, Total	EPA	EET CF
Total Nitrogen	Nitrogen, Total	EPA	EET CF
1664A	HEM and SGT-HEM (Aqueous)	1664A	EET CF
200.7	Preparation, Total Metals	EPA	EET CF
245.1	Preparation, Mercury	EPA	EET CF
351.2	Nitrogen, Total Kjeldahl	EPA	EET CF
365.2/365.3/365	Phosphorus, Total	EPA	EET CF
Distill/CN	Distillation, Cyanide	None	EET CF

### Protocol References:

1664A = EPA-821-98-002

EPA = US Environmental Protection Agency

None = None

### Laboratory References:

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



Environment Testing  
America



**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>			
Client: <u>City of Ottumwa</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/4/24</u>	<u>0910</u>	<u>S. W</u>
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # ____ of ____
Cooler Custody Seals Present?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>R</u>		Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>3.8</u>		Corrected Temp (°C): <u>3.8</u>	
• Sample Container Temperature			
Container(s) used.	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			

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Client Information		Sampler		Lab P/M		Camera Tracking No(s)		COC No	
Client Contact: Troy Fadiga		Phone: RB + TRF		Hannah Dietz		State of Origin: Iowa		Page 1 of 1	
Company: City of Ottumwa (WPC)		PWSID		E-Mail: hannah.dietz@el.eurofins.com		Job #		Preservation Codes	
Address: 2222 South Emma Street		Due Date Requested		Analysis Requested		Total Number of Containers		M Hexane N None O ASNB02 P NAZ04S Q NAZS03 R NAH504 S H2SO4 T TSP Dodecahydrate U Acetone V MCAA W pH 4-5 L EDA Z other (specify)	
City: Ottumwa		TAT Requested (days)		Total Nitrogen		X		A HCL B NaOH C Zn Acetate D Nitric Acid E NaHSO4 F MeOH G Amchlor H Ascorbic Acid I Ice J DI Water K EDTA L EDA Other	
State Zip: IA 52501		Compliance Project: Yes No		Total Phosphorus		X			
Phone: (641) 683-0641		PO #		Chloride + Sulfate		X			
Email: fadiga@ottumwa.us		WO #		Total Phosphorus		X			
Project Name: Analytical Testing		Project #		Perform MS/MSD (Yes or No)		X			
Site: Mahaska Landfill Leachate		SSOW#		Field Filtered Sample (Yes or No)		X			
Sample Identification: Leachate		Sample Date: 10/2/2018		Sample Time: 10:38		X			
Sample Type: (C=Comp, G=grab)		Sample Time		Matrix (W=water, S=solid, O=vegetal, B=biological, A=air)		X			
Sample Type: G		G		W		X			
Preservation Code:		G		W		X			
Special Instructions/Note		Special Instructions/Note		Special Instructions/Note		X			
Special Instructions/Note		Special Instructions/Note		Special Instructions/Note		X			

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

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

**Empty Kit Relinquished by** Relinquished by: Troy Fadiga Date: 10/3/2018 Company: Company

**Custody Seals Intact:** Yes No

**Cooler Temperature(s) °C and Other Remarks:**

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

**Special Instructions/QC Requirements**

## Login Sample Receipt Checklist

Client: Ottumwa WWTP

Job Number: 310-292060-1

Login Number: 292060

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Warren, Joshua

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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 <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647

Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF with Leachate

Sample Date	11/13/2024	Sample Type	Grab
Sampler Start Time	12:23 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	11/13/2024	Time Received at Lab	12:23 AM

*Requested Analyses*

Parameter	Method	Results	Initials/Date
BOD-5	SM 5210 B-2011	2640	mg/L MP 11/14/24
TSS	USGS I-3765-85	267	mg/L MP 11/14/24
TKN	EPA 351.2	373	mg/L ZJX4 11/20/24
pH	SM 4500 H+B	7.2	TRF 11/13/2024

Comments: See attached report for oil & grease.

**City of Ottumwa Water Pollution Control Facility, Iowa Laboratory #257**

2222 S Emma St, Ottumwa, IA 52501

Phone: (641) 683-0641 Fax: (641) 683-0647


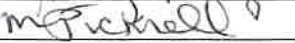
Heather Zuercher, Acting Laboratory Supervisor

*Analytical Report and Custody*

Industry: Mahaska County Sanitary Landfill, Permit #013

Sample Location: Tanker Truck at WPCF with Leachate

Sample Date	12/18/2024	Sample Type	Grab
Sampler Start Time	11:28 AM	Sampler Finish Time	NA

Sample Collector:	Troy Fadiga	Signature	
Lab Sample Received By:	Melissa Pickrell	Signature	
Date Received at Lab:	12/18/2024	Time Received at Lab	11:28 AM

*Requested Analyses*

Parameter	Method	Results		Initials/Date
BOD-5	SM 5210 B-2011	2404	mg/L	MP 12/19/24
TSS	USGS I-3765-85	210	mg/L	HZ 12/19/24
TKN	EPA 351.2	480	mg/L	ZJx4 12/26/24
pH	SM 4500 H+B	7.3		TRF 12/18/2024

Comments: See attached report for oil & grease.

# Client Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-295355-1

**Client Sample ID: Mahaska Landfill Leachate**

Date Collected: 11/13/24 12:23

Date Received: 11/15/24 08:30

**Lab Sample ID: 310-295355-2**

Matrix: Water

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease) (1664A)	16.7		5.0		mg/L		11/21/24 15:02	11/21/24 15:02	1
Nitrogen, Kjeldahl (EPA 351.2)	373		25.0		mg/L		11/20/24 05:12	11/20/24 16:33	1

# Client Sample Results

Client: Ottumwa WWTP  
Project/Site: Analytical Testing

Job ID: 310-297581-1

Client Sample ID: Mahaska Landfill Leachate

Lab Sample ID: 310-297581-4

Date Collected: 12/18/24 11:28

Matrix: Water

Date Received: 12/20/24 09:20

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease) (1664A)	18.0		5.0		mg/L		12/27/24 11:00	12/27/24 11:00	1
Nitrogen, Kjeldahl (EPA 351.2)	480		25.0		mg/L		12/26/24 05:18	12/26/24 22:01	1





**Appendix F**  
**2024 Landfill Gas Annual Report**

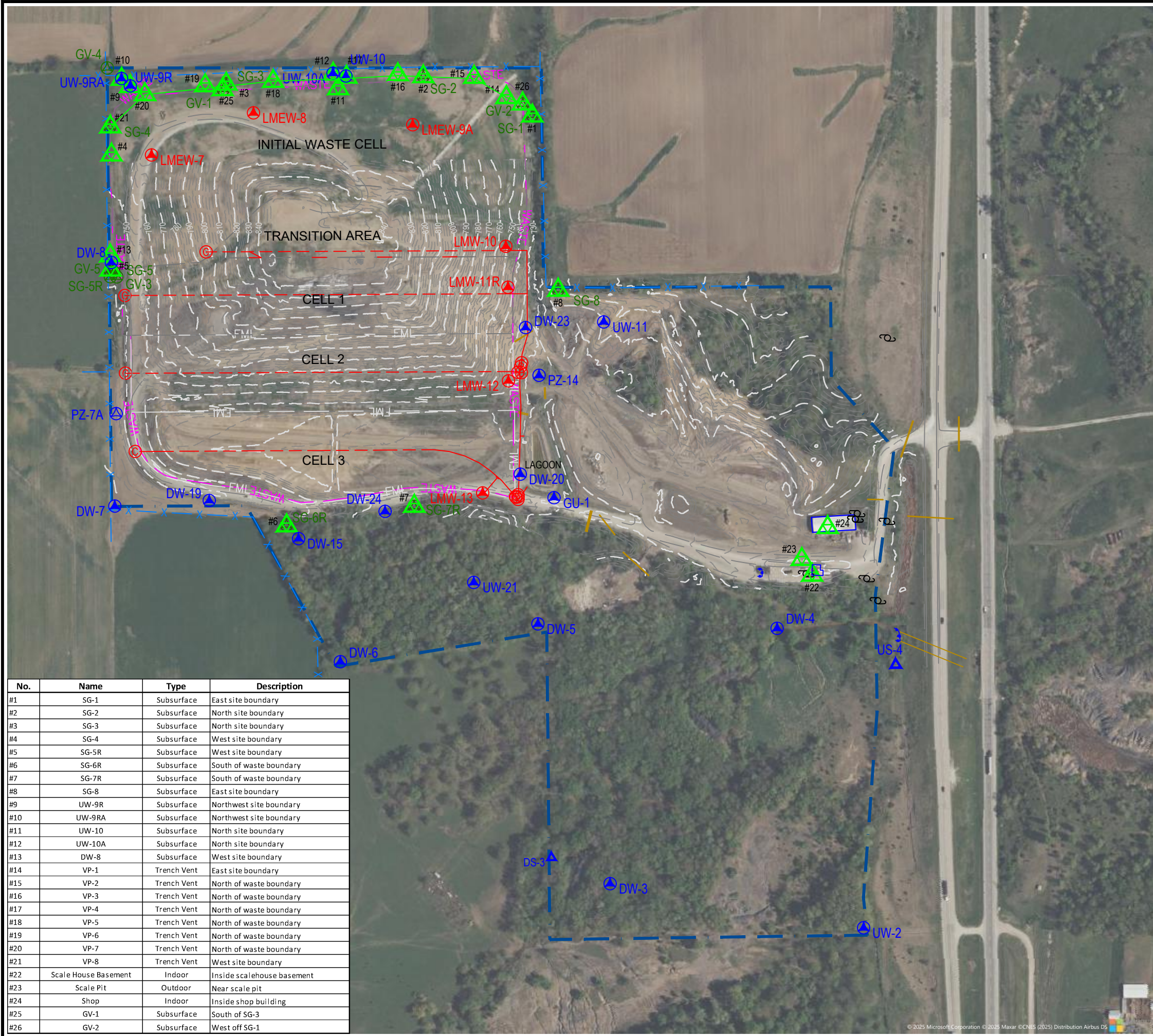
**Table 13**  
**Gas Monitoring Summary**  
**2024 Annual Water Quality Report**  
**Mahaska County Sanitary Landfill - Binns & Stevens Site**  
**Permit No. 62-SDP-01-74P**

No.	Name	Monitoring Points		1/5/2024			5/14/2024			9/5/2024			11/20/2024		
		Type	Description	% LEL	% methane	S (Y/N)	% LEL	% methane	S (Y/N)	% LEL	% methane	S (Y/N)	% LEL	% methane	S (Y/N)
#1	SG-1	Subsurface	East site boundary	0		N	1		N	0		N	1		N
#2	SG-2	Subsurface	North site boundary	9		N	1		N	0		N	0		N
#3	SG-3	Subsurface	North site boundary	>100	51	N	>100		N	>100		N	60		N
#4	SG-4	Subsurface	West site boundary	0		N	>100		N	10		N	2		N
#5	SG-5R	Subsurface	West site boundary	>100	21	N	0		N	>100		N	>100		N
#6	SG-6R	Subsurface	South of waste boundary	0		N	0		N	0		N	0		N
#7		Subsurface	South of waste boundary	0		N	0		N	0		N	0		N
#8	SG-8	Subsurface	East site boundary	0		N	0		N	0		N	0		N
#9	UW-9R	Subsurface	Northwest site boundary	>100	54	N	0		N	>100		N	55		N
#10	UW-9RA	Subsurface	Northwest site boundary	0	0	N	0		N	>100		N	>100		N
#11	UW-10	Subsurface	North site boundary	>100	39	N	0		N	>100		N	>100		N
#12	UW-10A	Subsurface	North site boundary	0		Y	0		Y	0		Y	0		Y
#13	DW-8	Subsurface	West site boundary	0		N	0		N	0		N	0		N
#14	VP-1	Trench Vent	East site boundary	>100	14		0			0			0		
#15	VP-2	Trench Vent	North of waste boundary	6			0			0			0		
#16	VP-3	Trench Vent	North of waste boundary	>100	16		>100			>100			28		
#17	VP-4	Trench Vent	North of waste boundary	>100	19		>100			>100			>100		
#18	VP-5	Trench Vent	North of waste boundary	>100	64		>100			>100			54		
#19	VP-6	Trench Vent	North of waste boundary	>100	37		>100			>100			>100		
#20	VP-7	Trench Vent	North of waste boundary	>100	29		>100			>100			>100		
#21	VP-8	Trench Vent	West site boundary	>100	8		1			3			0		
#22	Scale House Basement	Indoor	Inside scalehouse basement	0			0			0			0		
#23	Scale Pit	Outdoor	Near scale pit	0			0			0			0		
#24	Shop	Indoor	Inside shop building	0			1			0			0		
#25	GV-1	Subsurface	South of SG-3	>100	60	N	>100		N	>100		N	>100		N
#26	GV-2	Subsurface	West of SG-1	>100	61	N	0		N	>100		N	>100		N

Comments:

- 1) S(Y/N) - Was screen submerged, yes or no or blank is non-applicable.
- 2) Landfill gas control at the Binns & Stevens MSWLF unit consists of a passive landfill gas trench constructed in April 2015 located on the northern boundary of the site. Gas laterals associated with the trench were installed in August-September 2021.
- 3) Methane volume measurements were inadvertently omitted during the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarter measurement events.

\\DES-FS01\DESMOINES\PROJECT\27224360\_25\AUTOCAD\MAHASKA 2024 ANQR V0.0.DWG



- LEGEND:**
- EXISTING 2' CONTOUR
  - EXISTING 10' CONTOUR
  - APPROXIMATE EXISTING WASTE BOUNDARY
  - FML BOUNDARY
  - EXISTING CELL BOUNDARY
  - FUTURE CELL BOUNDARY
  - APPROXIMATE PROPERTY BOUNDARY
  - ▭ BUILDING
  - ▬ GRAVEL ROAD
  - ▬ PAVED ROAD
  - X— FENCELINE
  - X— CULVERT
  - DW-1 DOWN GRADIENT MONITORING WELL
  - UW-1 UP GRADIENT MONITORING WELL
  - LMEW-1 LEACHATE EXTRACTION WELL
  - LPZ-1 LEACHATE PIEZOMETER
  - PZ-1 GROUNDWATER PIEZOMETER
  - GV-1 LANDFILL GAS WELL
  - DS-3 SURFACE WATER SAMPLING POINT
  - POLE
  - #1 METHANE MONITORING POINT
  - VAPOR TRENCH

No.	Name	Type	Description
#1	SG-1	Subsurface	East site boundary
#2	SG-2	Subsurface	North site boundary
#3	SG-3	Subsurface	North site boundary
#4	SG-4	Subsurface	West site boundary
#5	SG-5R	Subsurface	West site boundary
#6	SG-6R	Subsurface	South of waste boundary
#7	SG-7R	Subsurface	South of waste boundary
#8	SG-8	Subsurface	East site boundary
#9	UW-9R	Subsurface	Northwest site boundary
#10	UW-9RA	Subsurface	Northwest site boundary
#11	UW-10	Subsurface	North site boundary
#12	UW-10A	Subsurface	North site boundary
#13	DW-8	Subsurface	West site boundary
#14	VP-1	Trench Vent	East site boundary
#15	VP-2	Trench Vent	North of waste boundary
#16	VP-3	Trench Vent	North of waste boundary
#17	VP-4	Trench Vent	North of waste boundary
#18	VP-5	Trench Vent	North of waste boundary
#19	VP-6	Trench Vent	North of waste boundary
#20	VP-7	Trench Vent	North of waste boundary
#21	VP-8	Trench Vent	West site boundary
#22	Scale House Basement	Indoor	Inside scalehouse basement
#23	Scale Pit	Outdoor	Near scale pit
#24	Shop	Indoor	Inside shop building
#25	GV-1	Subsurface	South of SG-3
#26	GV-2	Subsurface	West off SG-1



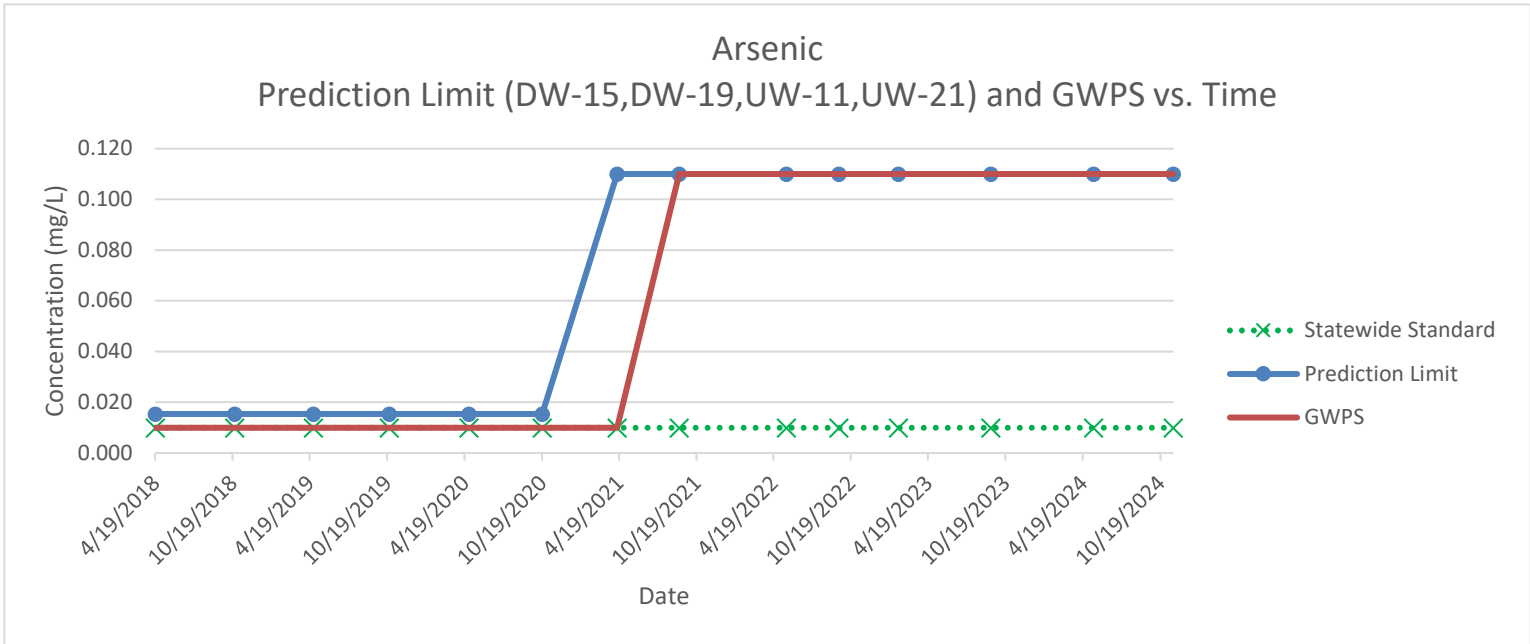
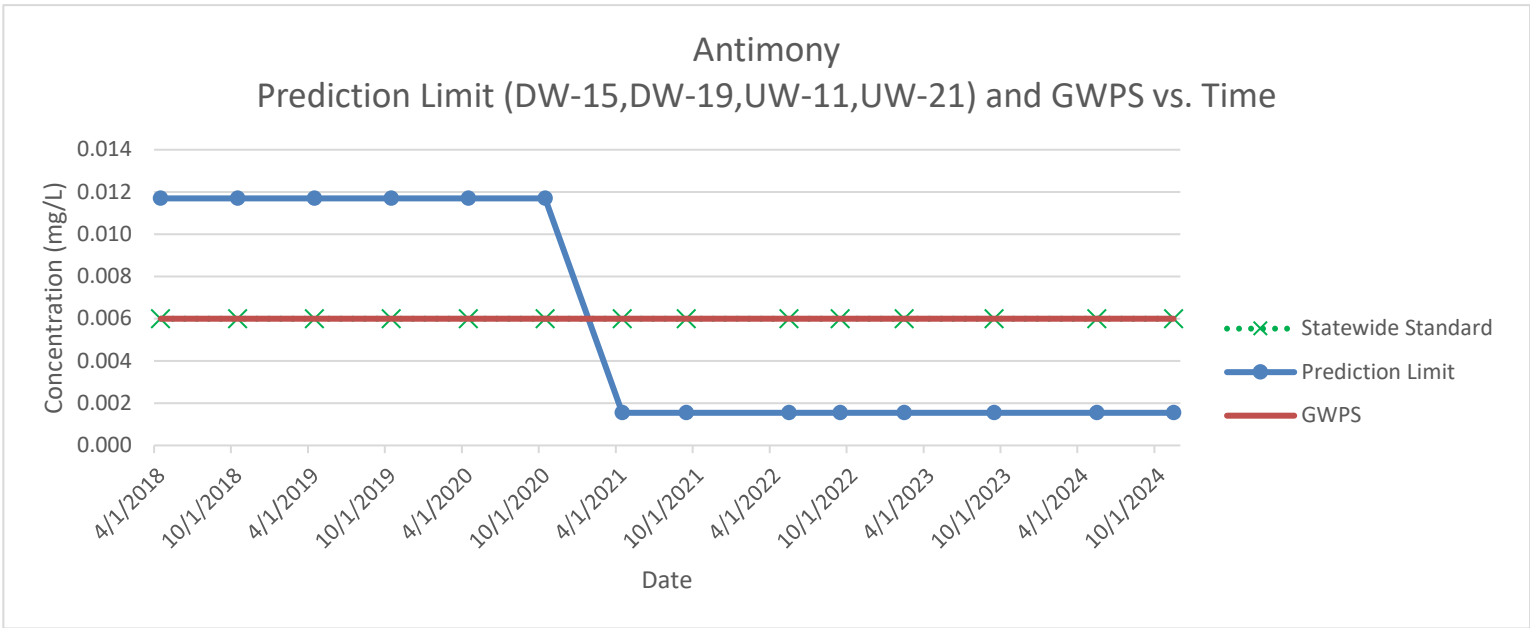
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CLIENT	MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION						
PROJECT TITLE	BINNS AND STEVENS SITE 2024 ANNUAL WATER QUALITY REPORT						
CLIENT	MAHASKA COUNTY SOLID WASTE MANAGEMENT COMMISSION 2979 US HIGHWAY 63 OSKALOOSA, IA						
SCS ENGINEERS	1680 ALL STATE COURT, SUITE 100 WEST DES MOINES, IA 50265 PH. (515) 631-6160						
CADD FILE:	MAHASKA 2024 ANQR V0.0.DWG						
DATE:	2/27/25						
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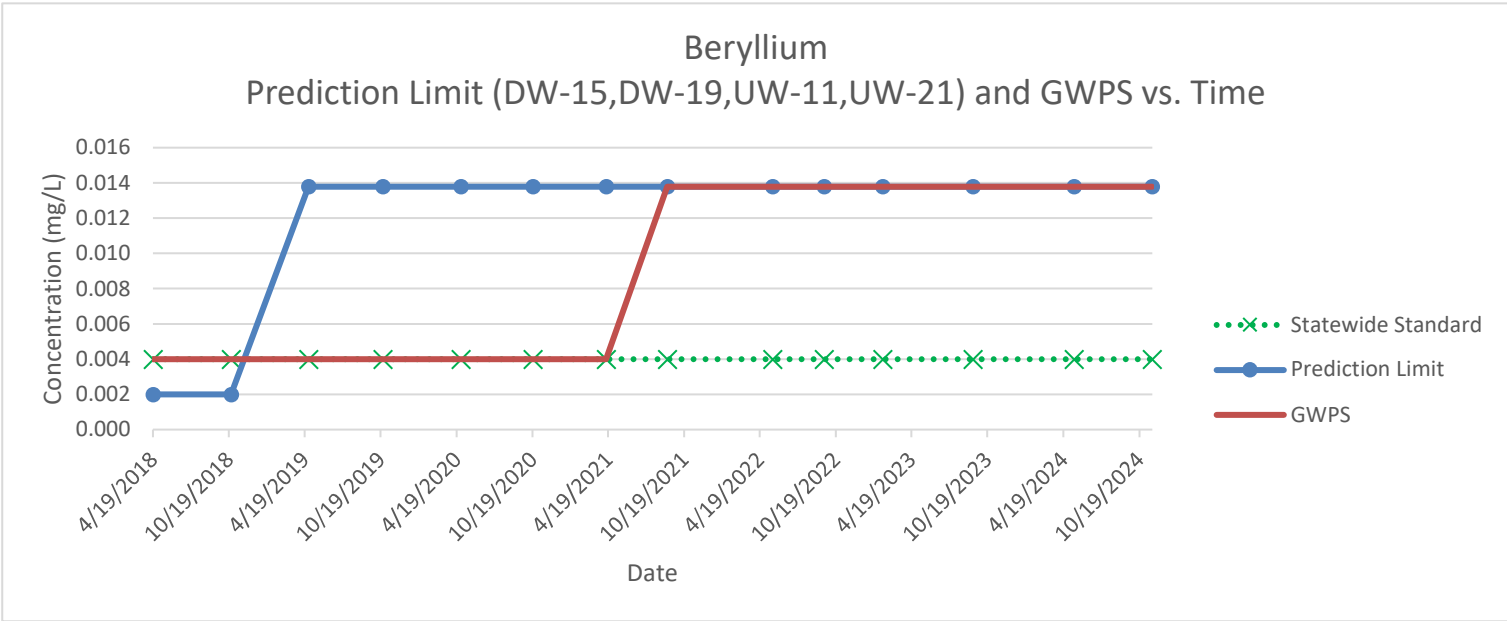
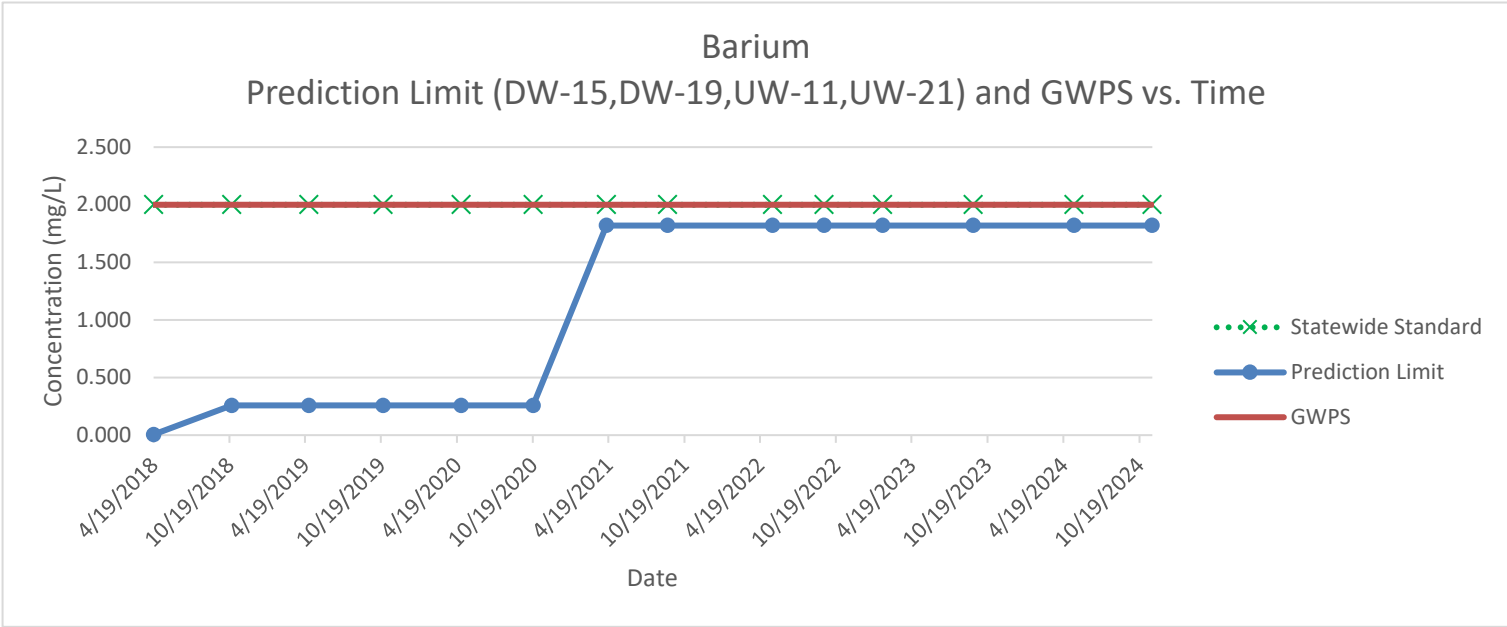
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**Appendix G**  
**AMD Mann-Kendall Trend Evaluation Summary Table**

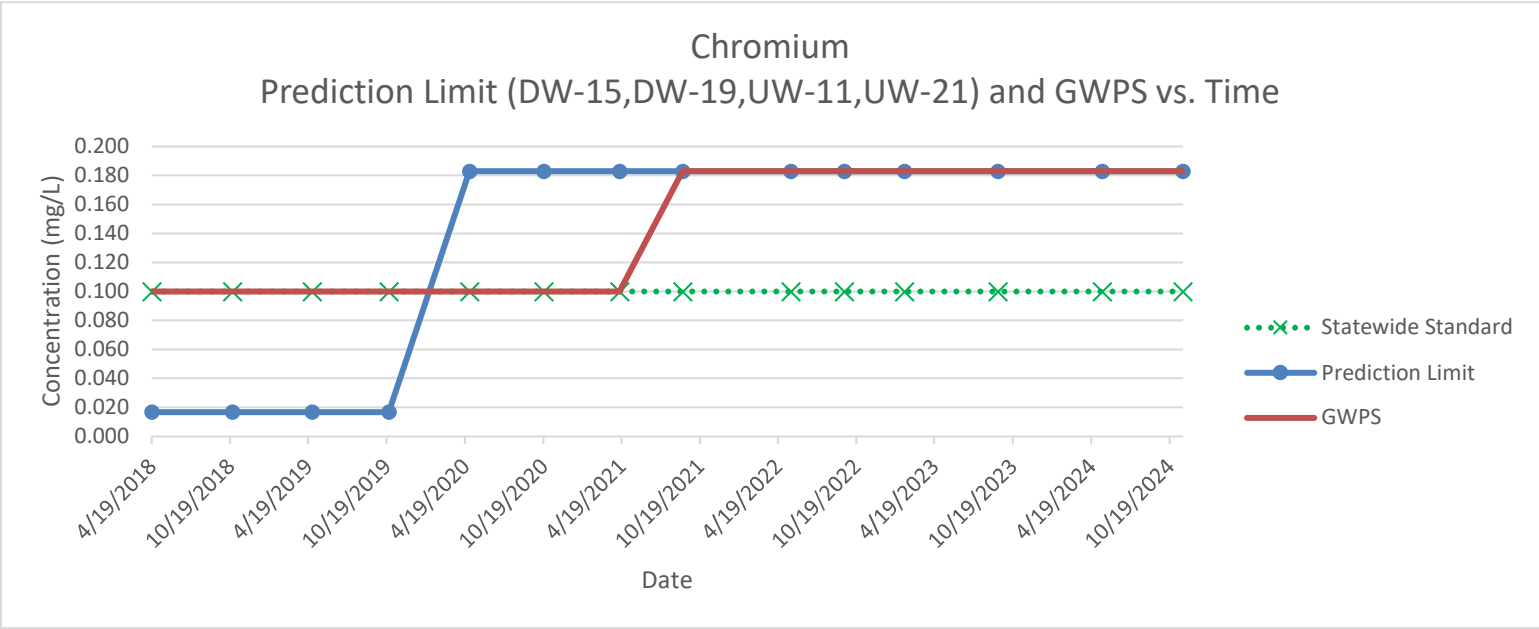
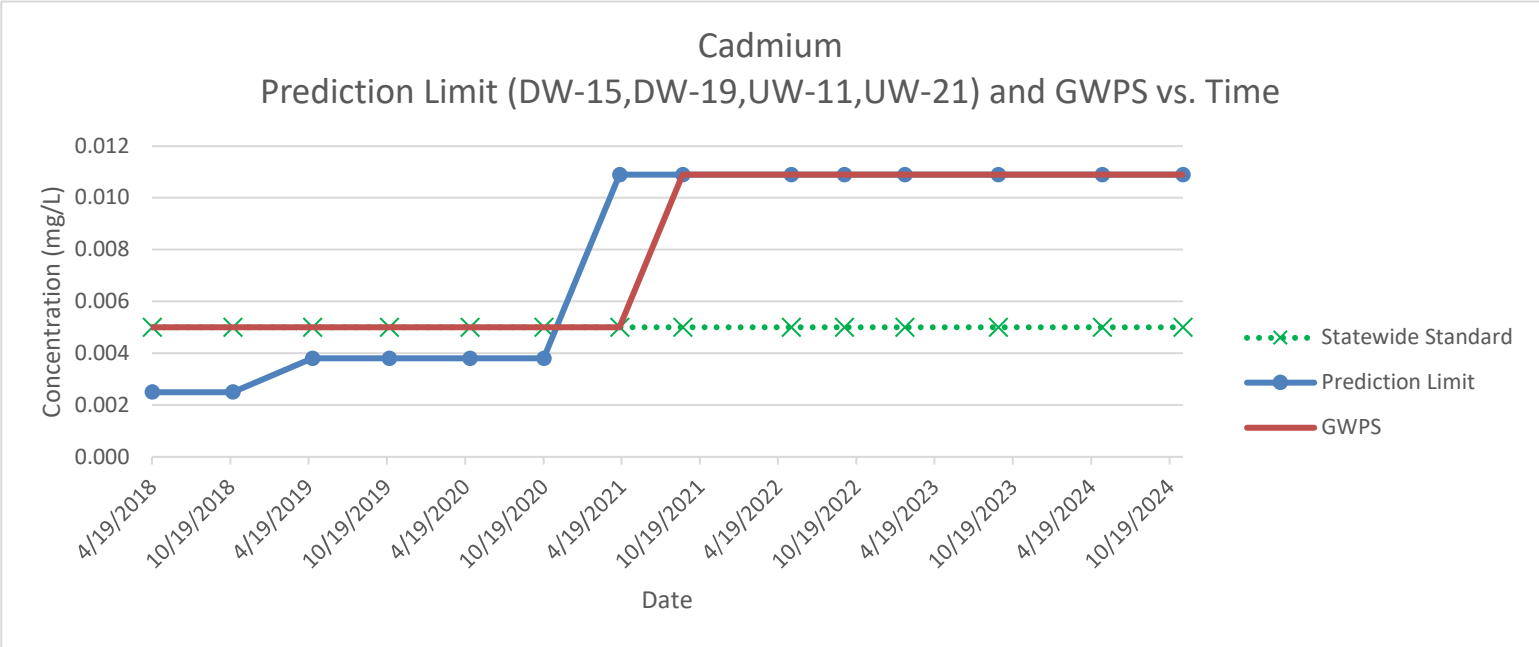
Monitoring Well	Constituent Name	Calculated Statistic		
		Decreasing Trend	Stable Trend	Increasing Trend
DW-8	Alkalinity, Total [CaCO3]		3	
	Aluminum		6	
	Iron		8	
	pH		1	
	Sulfate		6	
DW-15	Alkalinity, Total [CaCO3]		4	
	Aluminum		2	
	Iron		10	
	pH	-16		
	Sulfate		8	
DW-19	Alkalinity, Total [CaCO3]			14
	Aluminum		5	
	Iron		2	
	pH		-4	
	Sulfate			14
DW-23	Alkalinity, Total [CaCO3]		5	
	Aluminum		10	
	Iron		-10	
	pH		-12	
	Sulfate		-6	
DW-24	Aluminum			24
	Iron		4	
	pH		3	
	Sulfate			14
PZ-14	Alkalinity, Total [CaCO3]	-18		
	Aluminum		2	
	Iron			16
	pH	-14		
	Sulfate		6	
UW-10	Alkalinity, Total [CaCO3]		8	
	Aluminum		-3	
	Iron	-24		
	pH		0	
	Sulfate	-18		
UW-11	Alkalinity, Total [CaCO3]		6	
	Aluminum		-1	
	Iron	-25		
	pH			18
	Sulfate		-12	

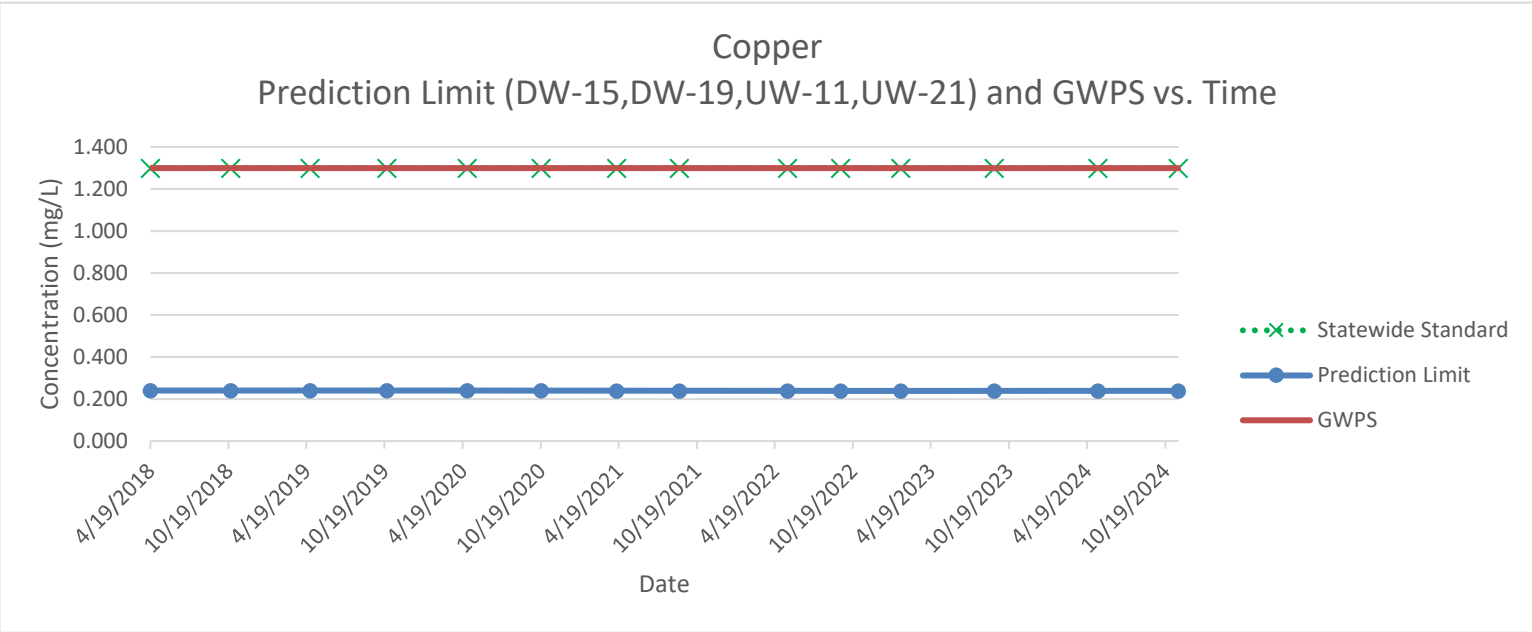
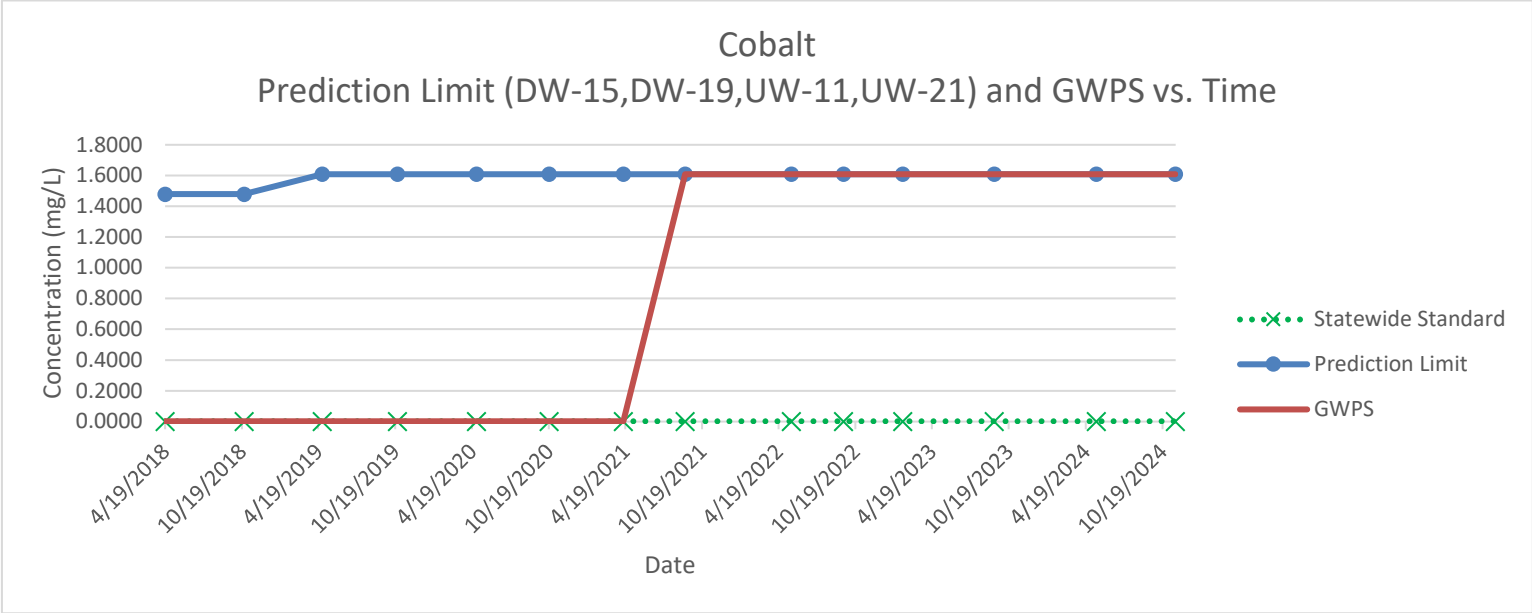
**Appendix H**  
**Standards History Graphs**

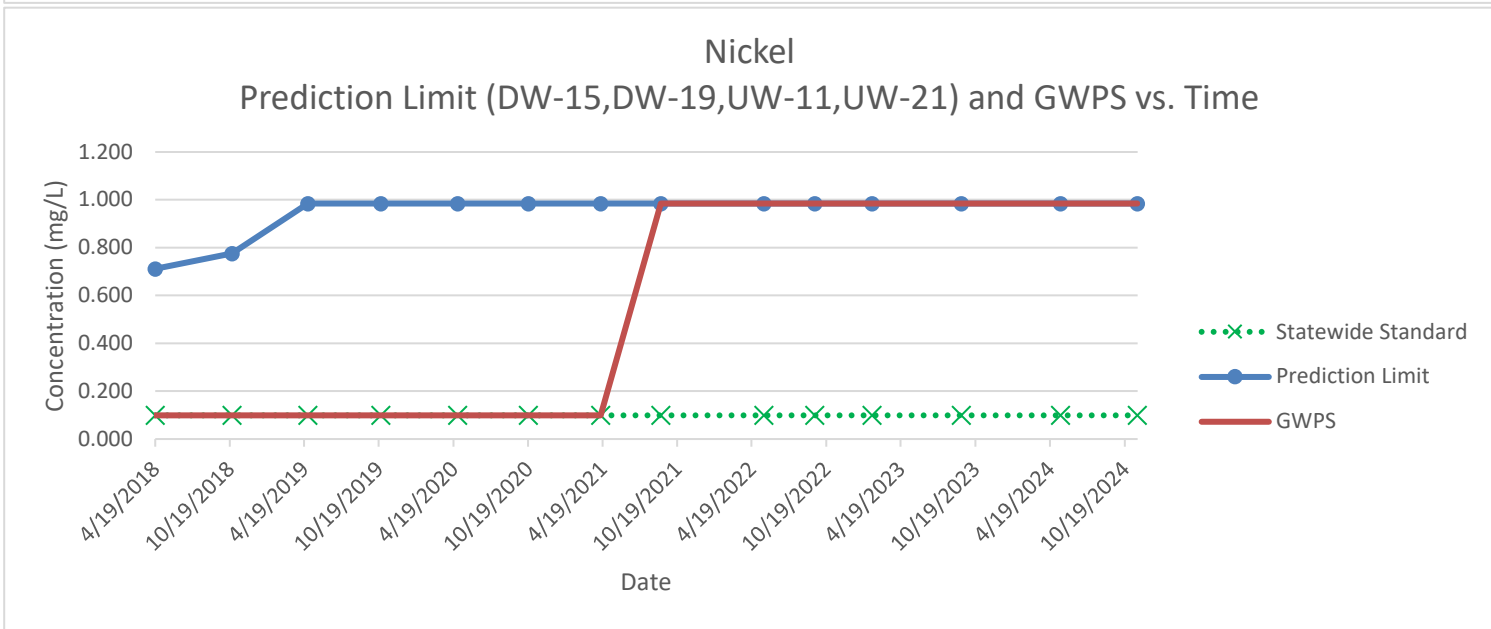
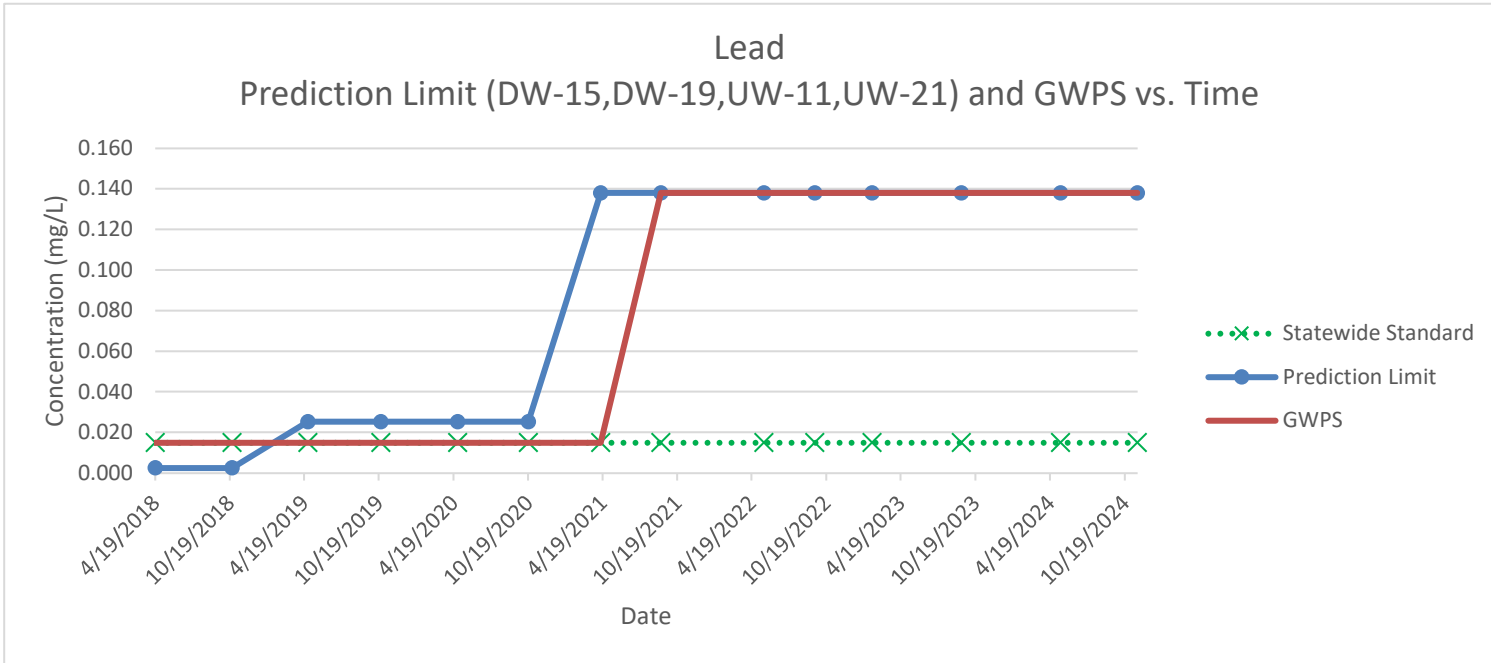


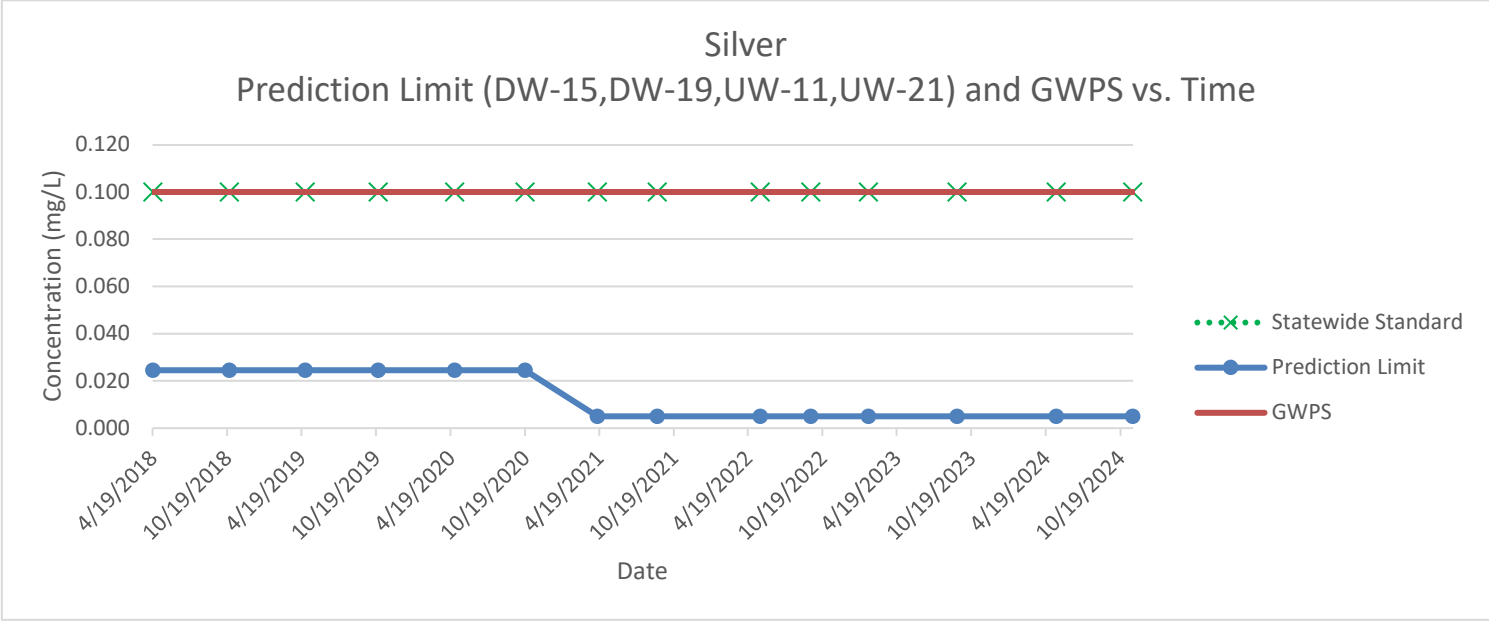
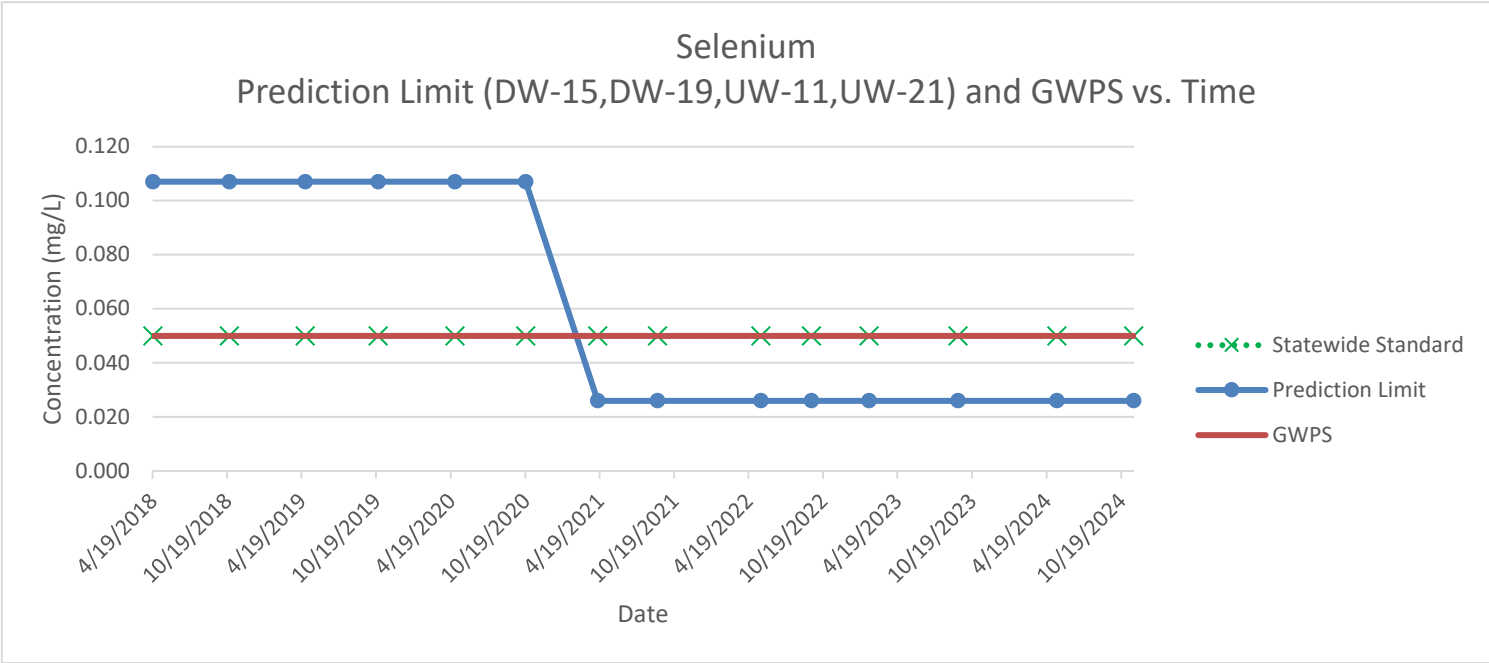


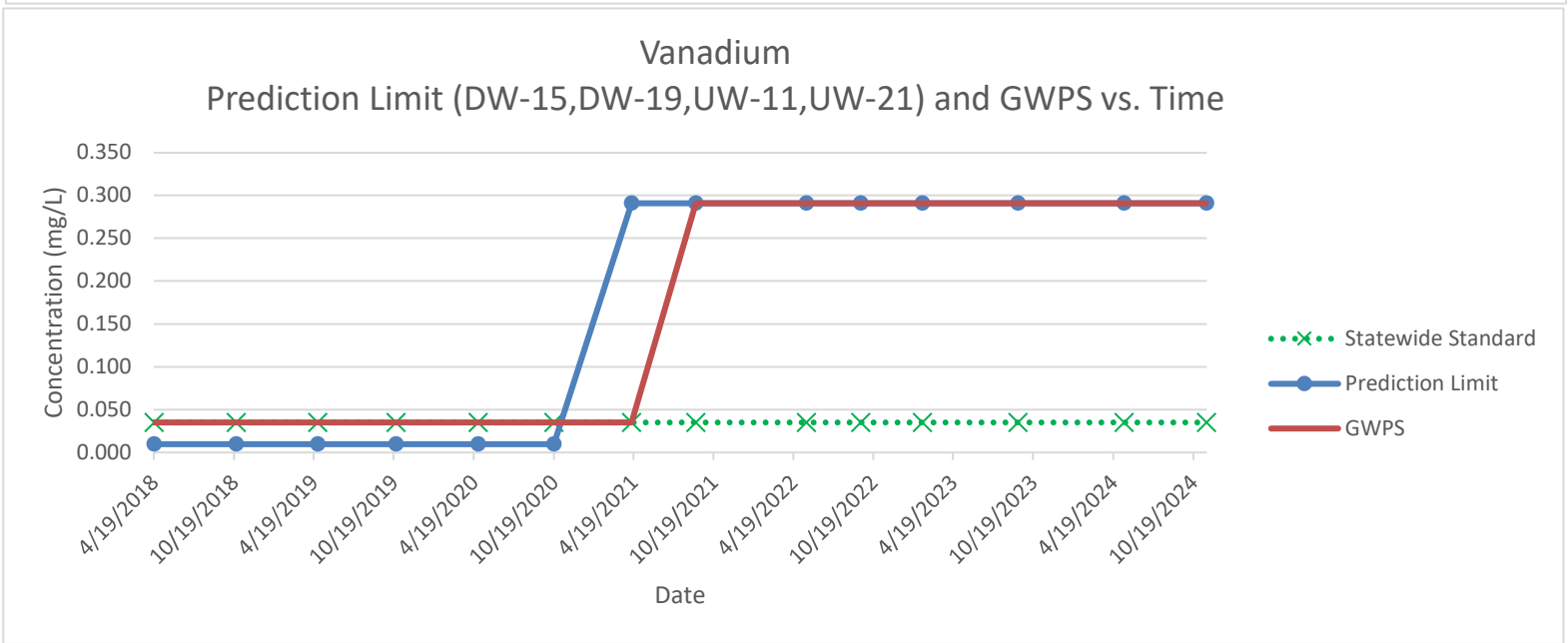
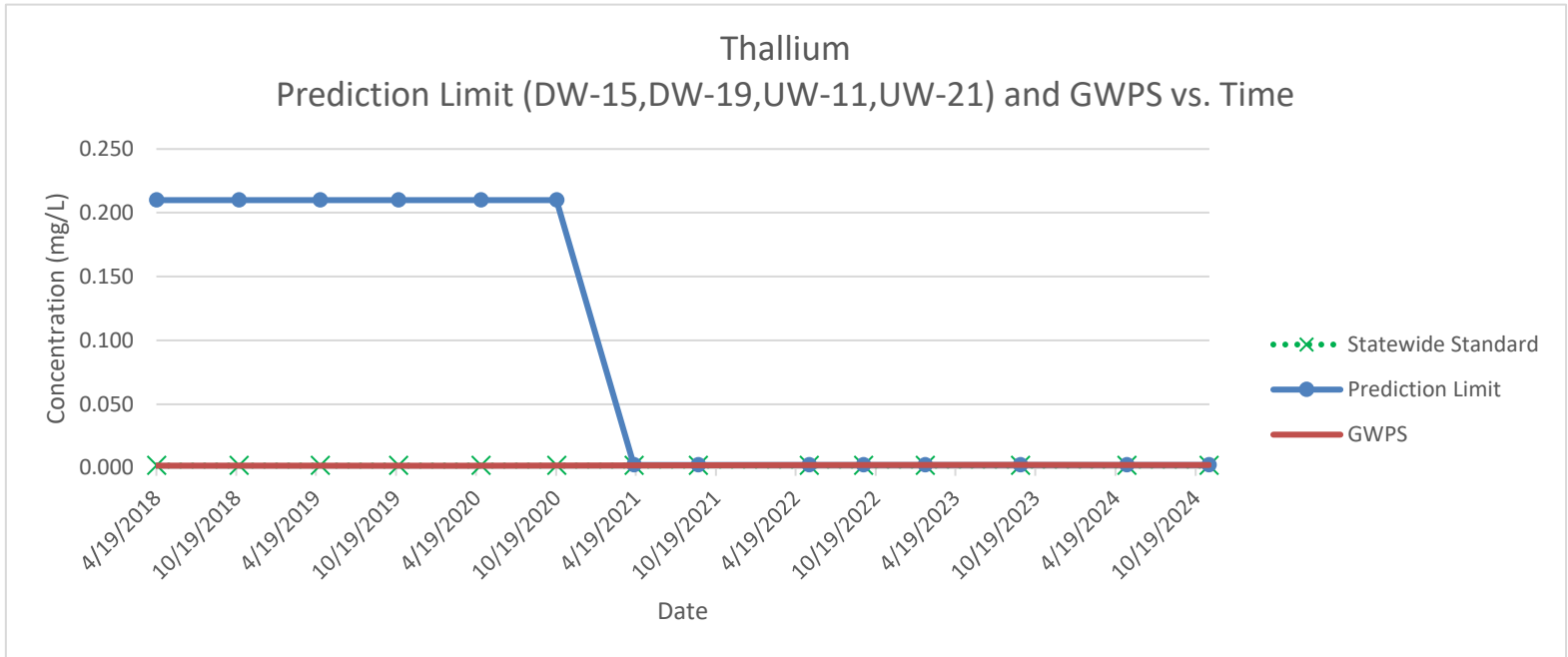




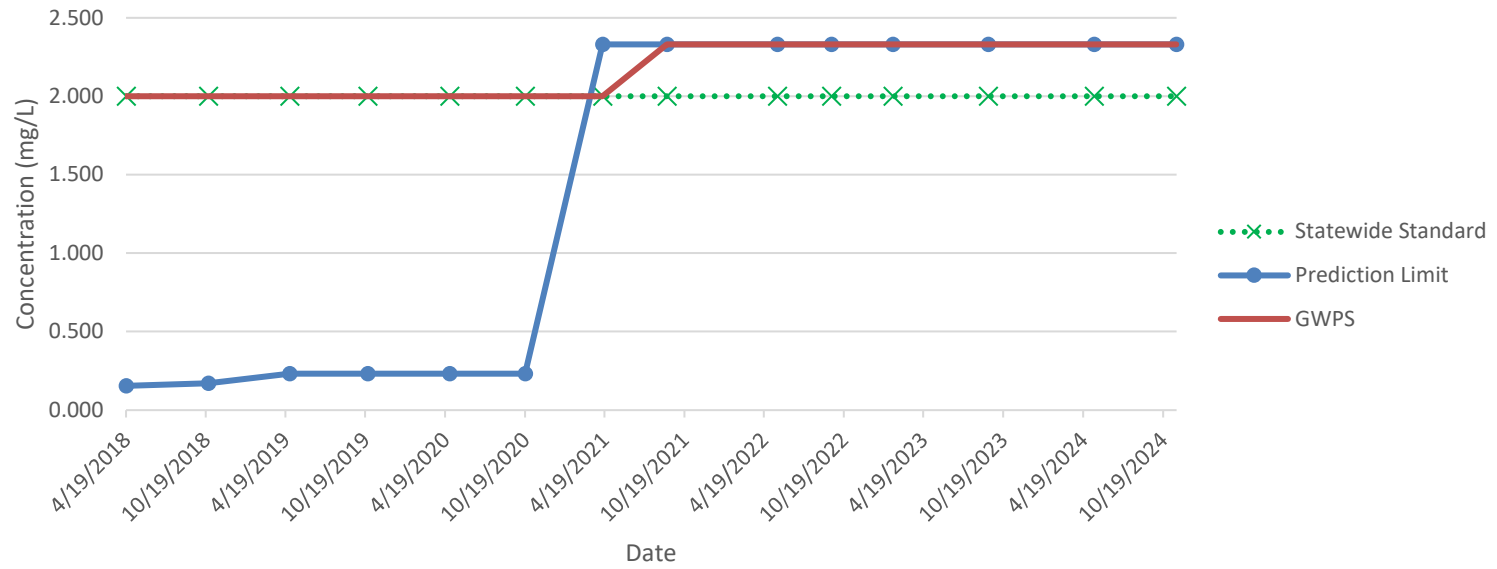






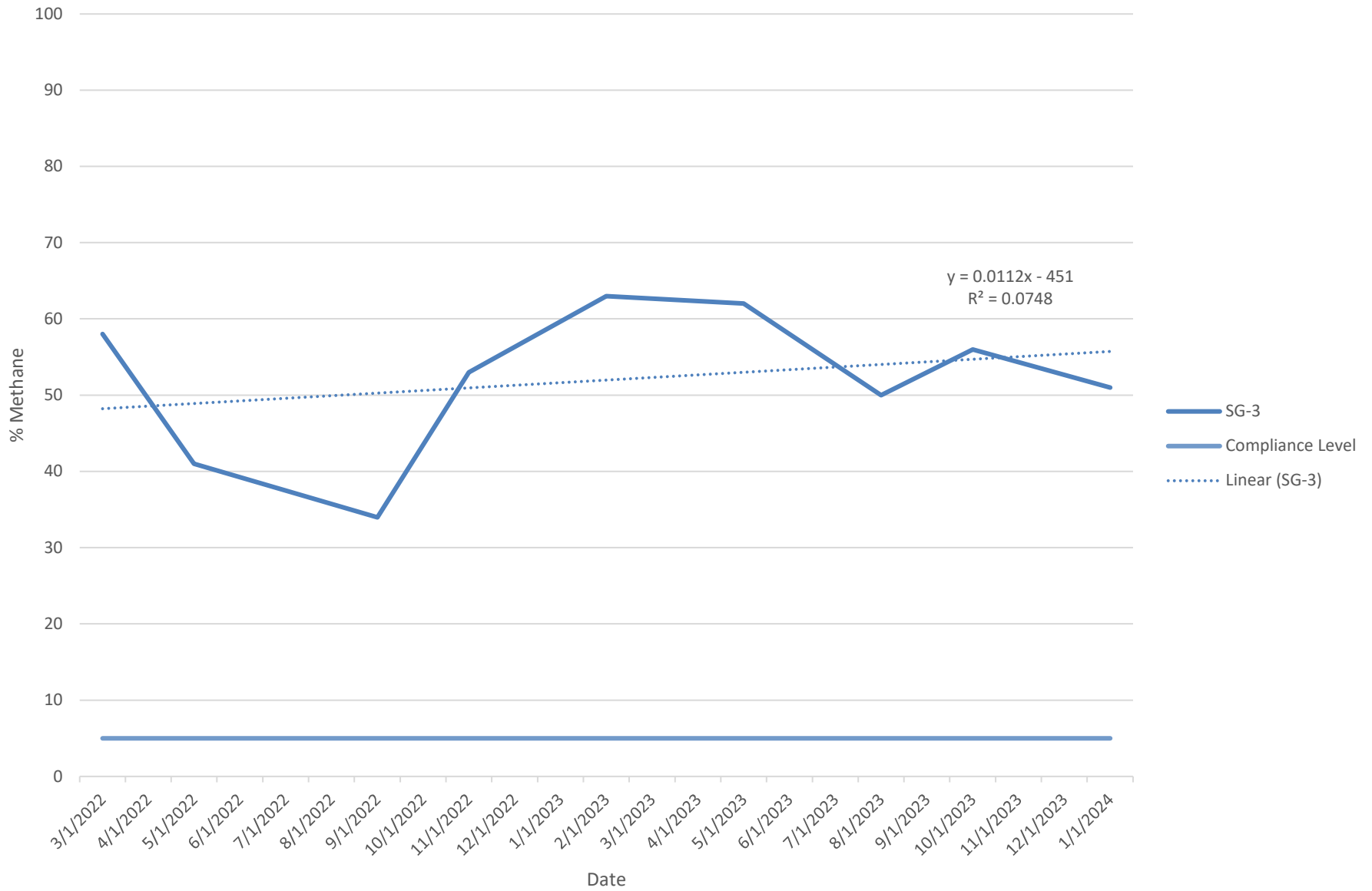


Zinc  
Prediction Limit (DW-15,DW-19,UW-11,UW-21) and GWPS vs. Time



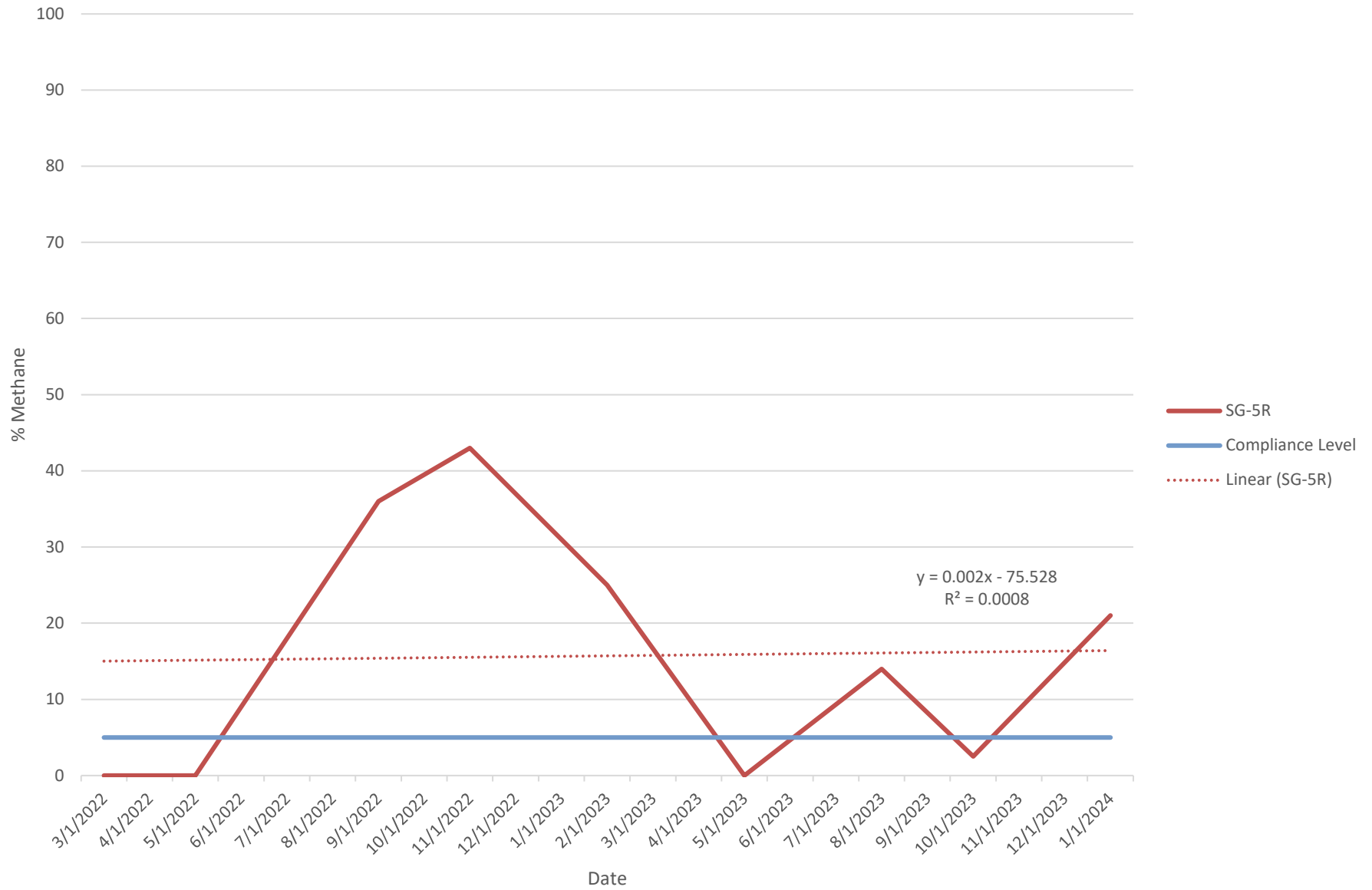
**Appendix I**  
**Methane Statistical Evaluation Graphs**

# SG-3R Methane by Volume

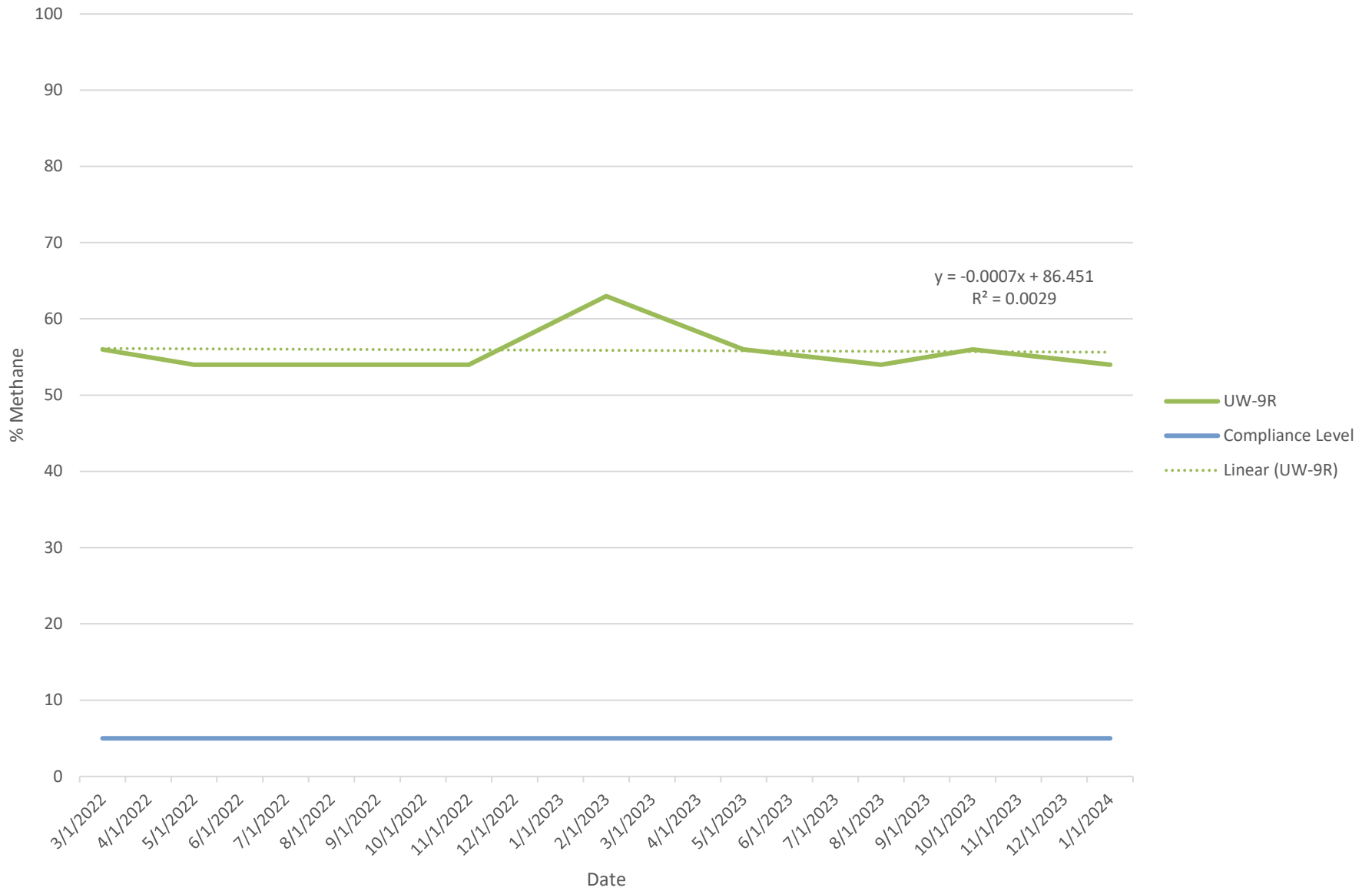




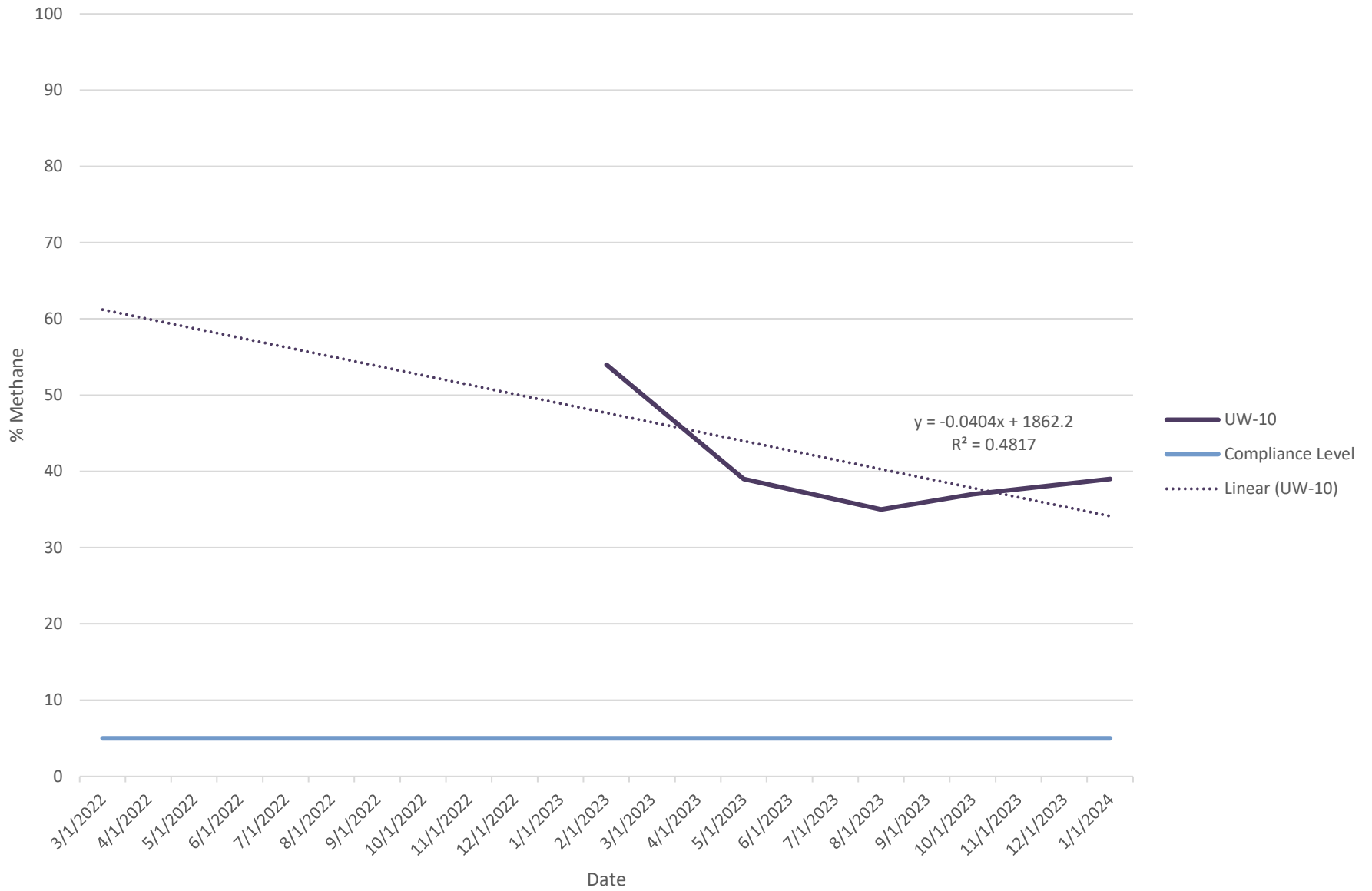
# SG-5R Methane by Volume



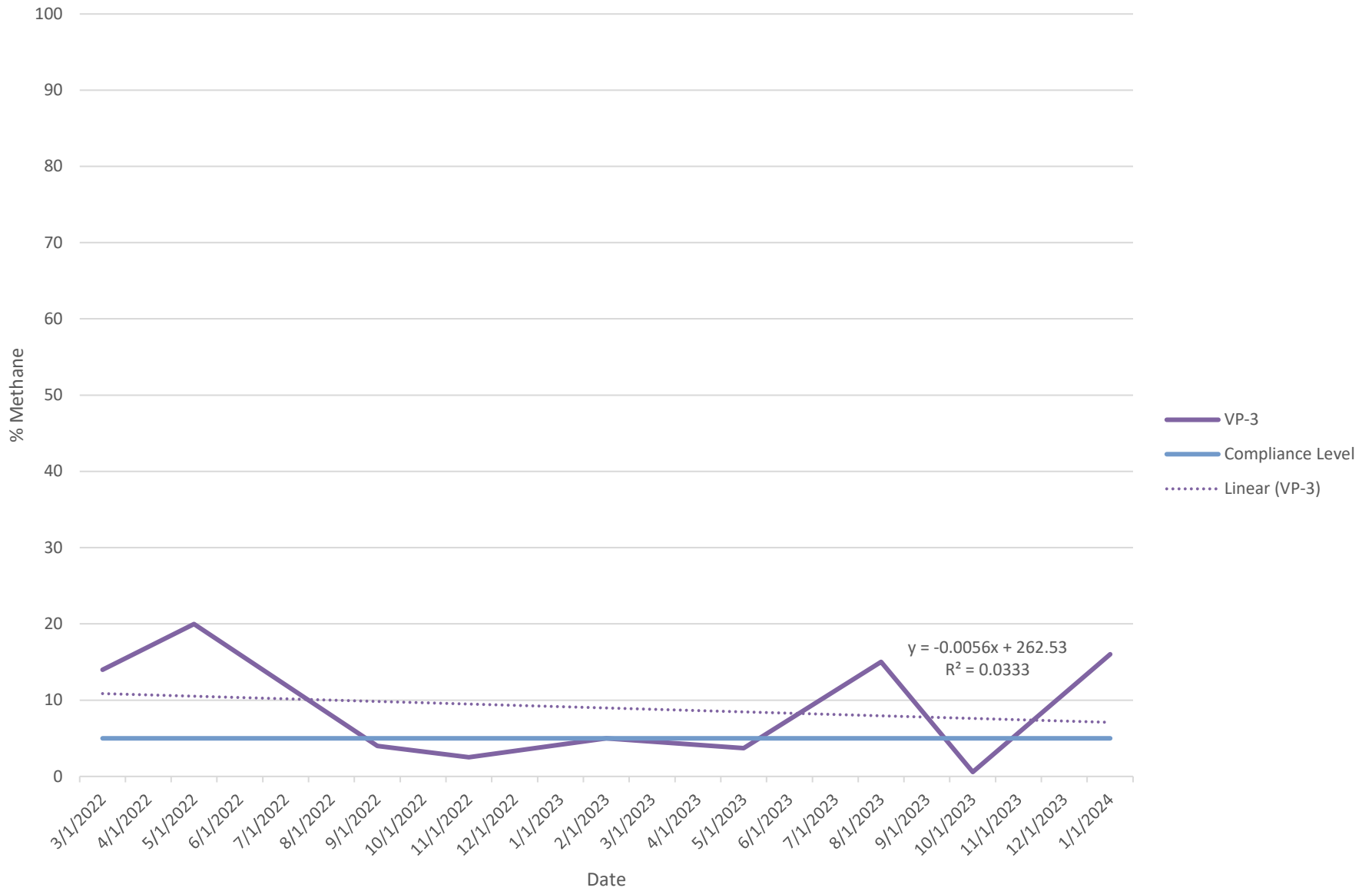
# UW-9R Methane by Volume



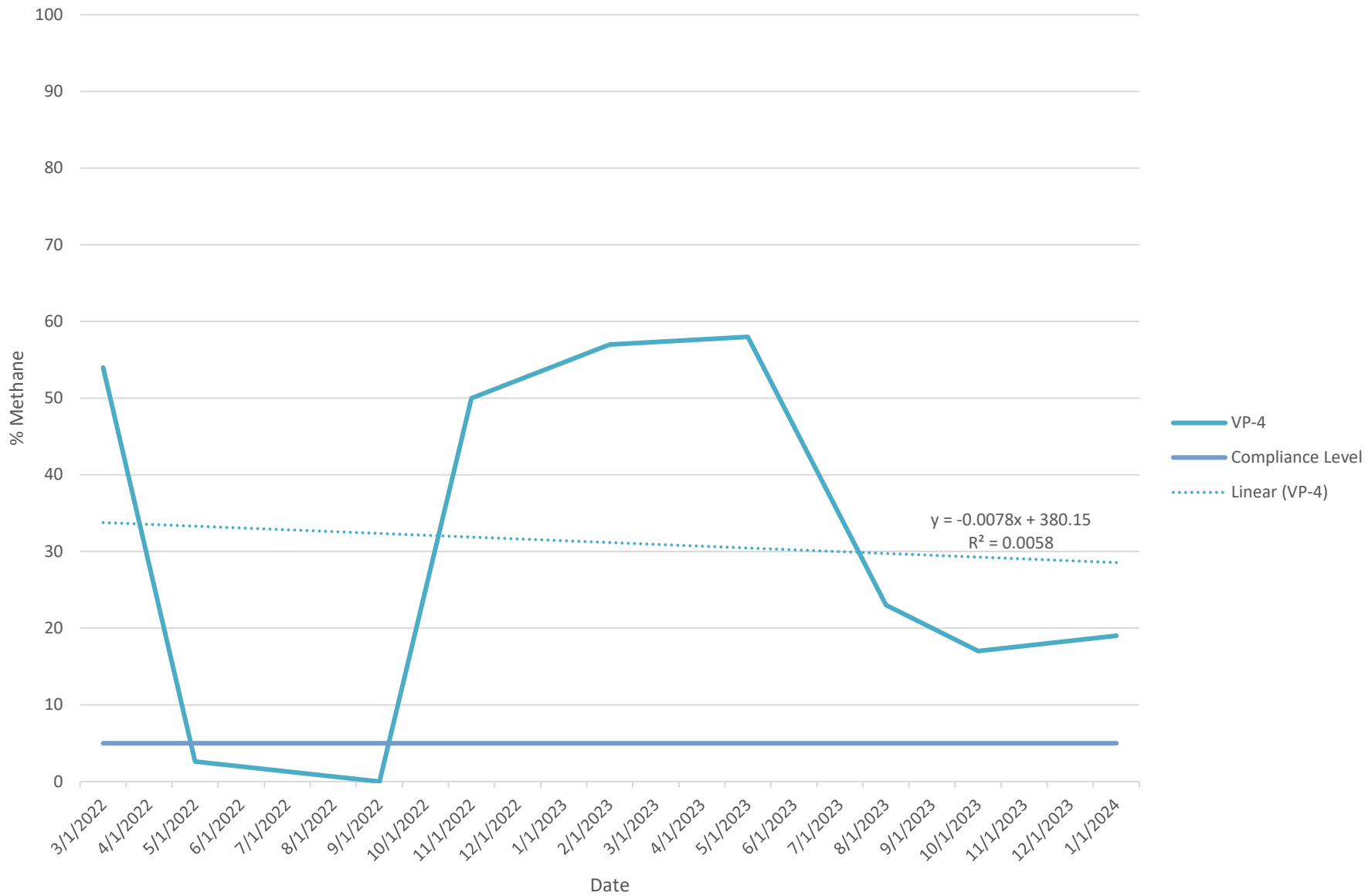
# UW-10 Methane by Volume



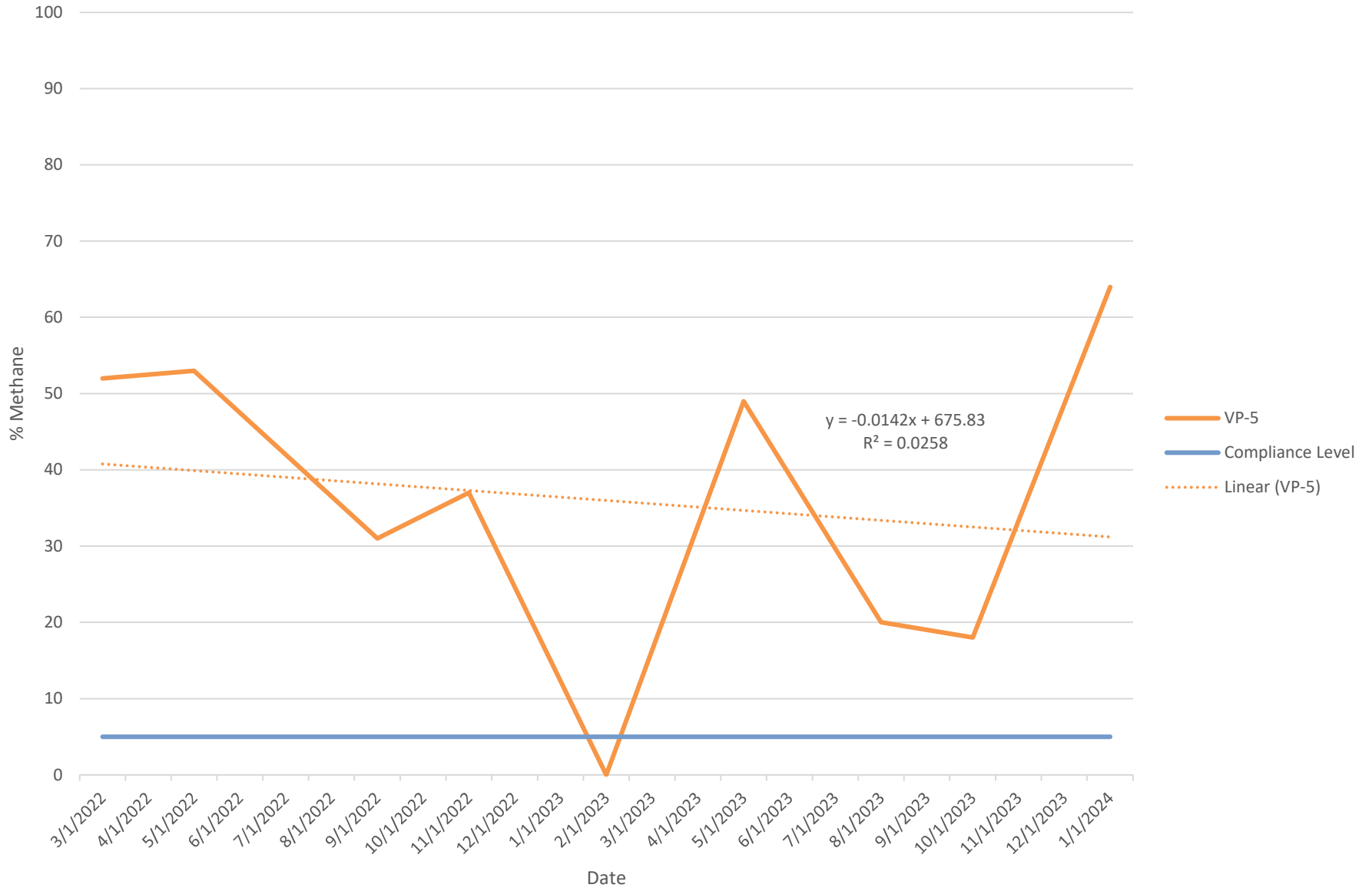
# VP-3 Methane by Volume



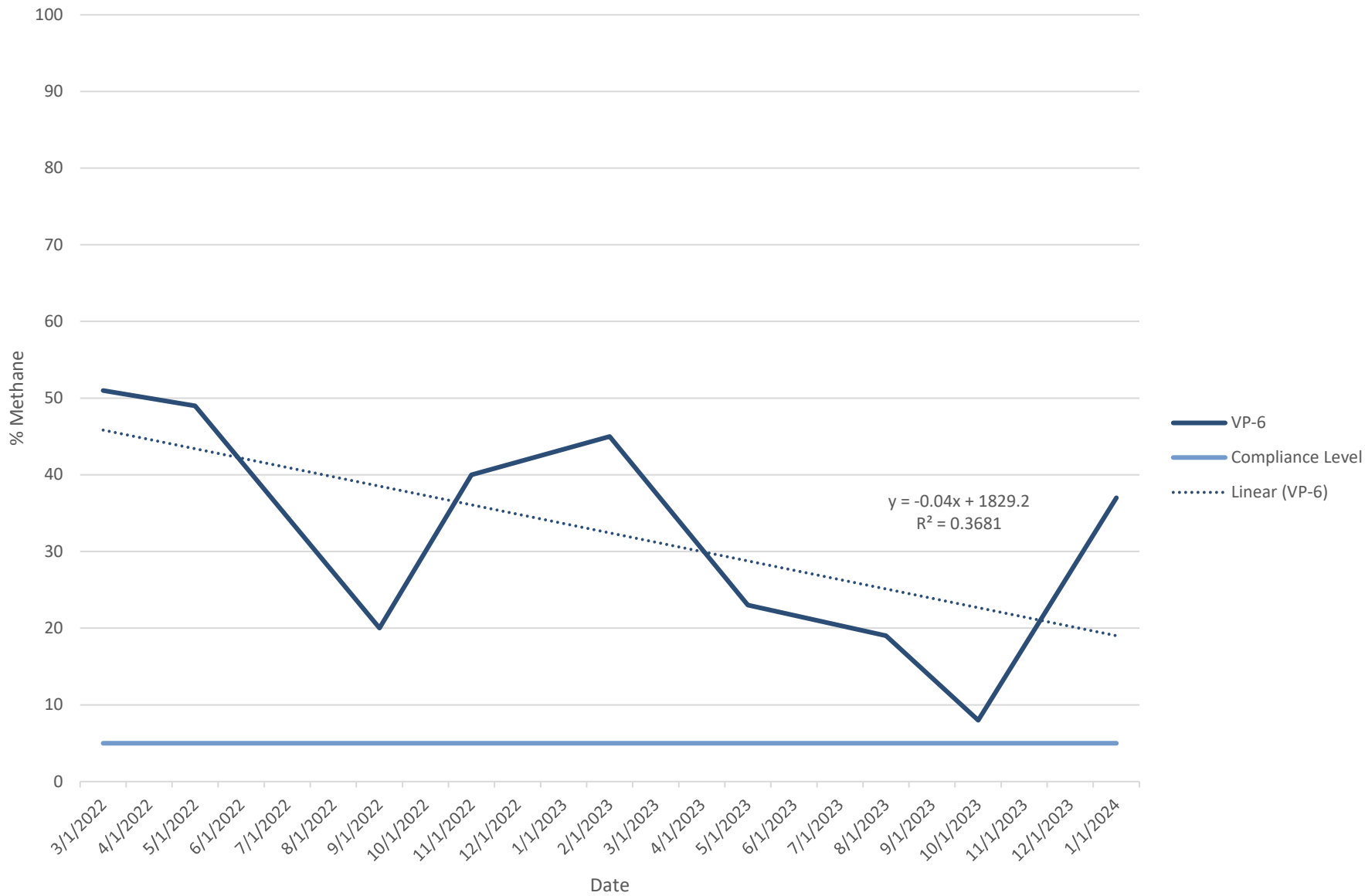
# VP-4 Methane by Volume



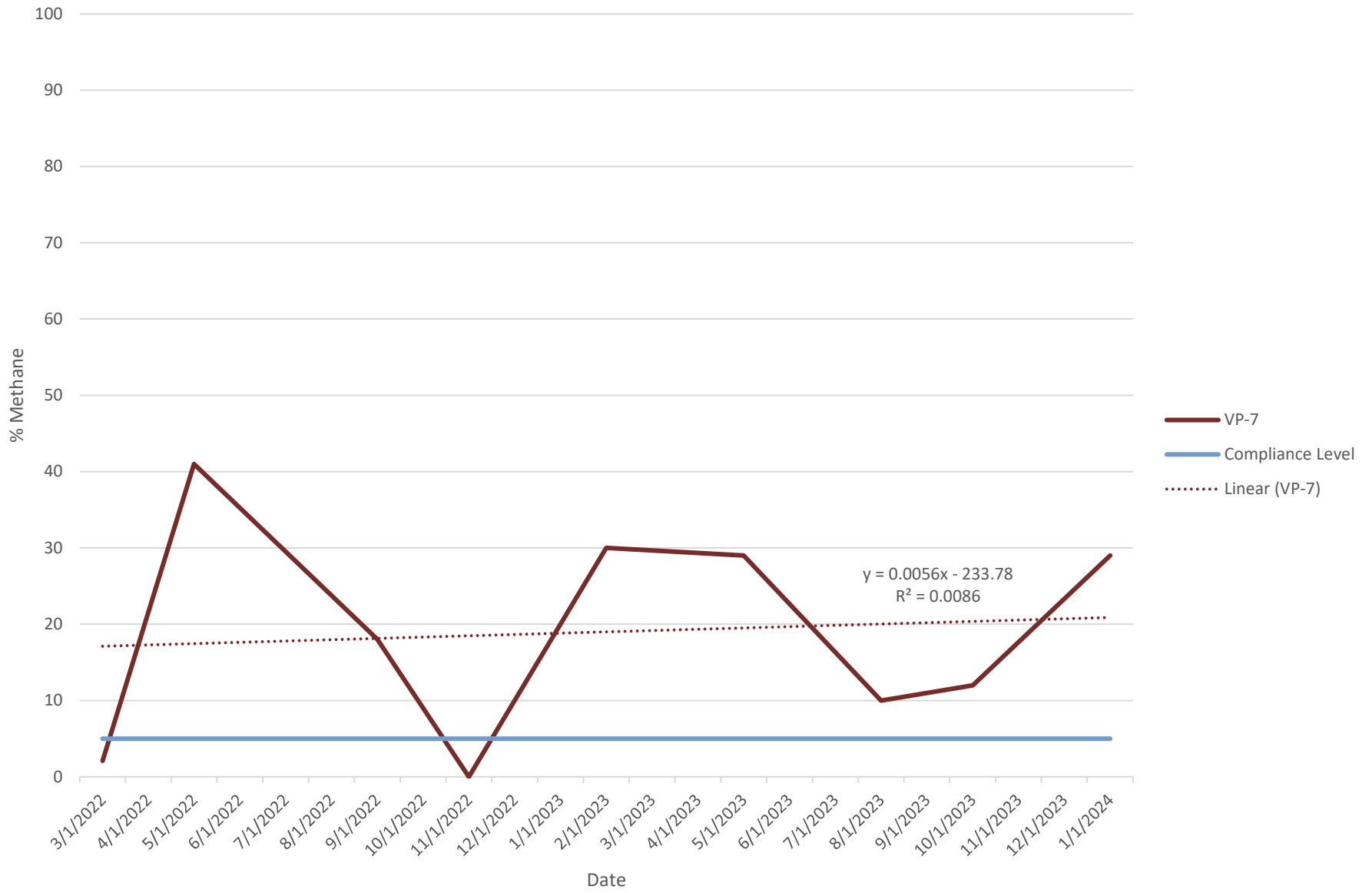
# VP-5 Methane by Volume



# VP-6 Methane by Volume

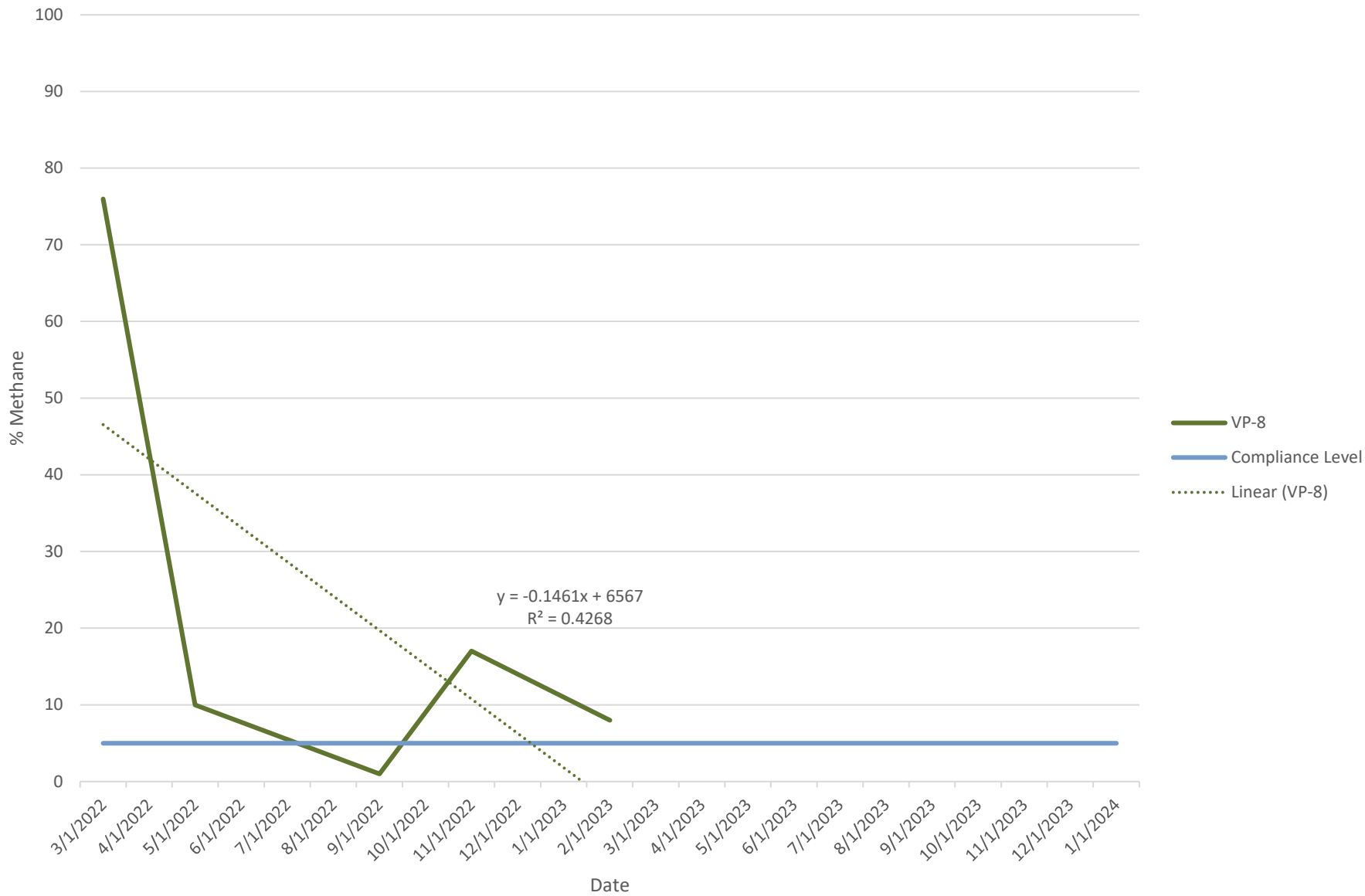


# VP-7 Methane by Volume

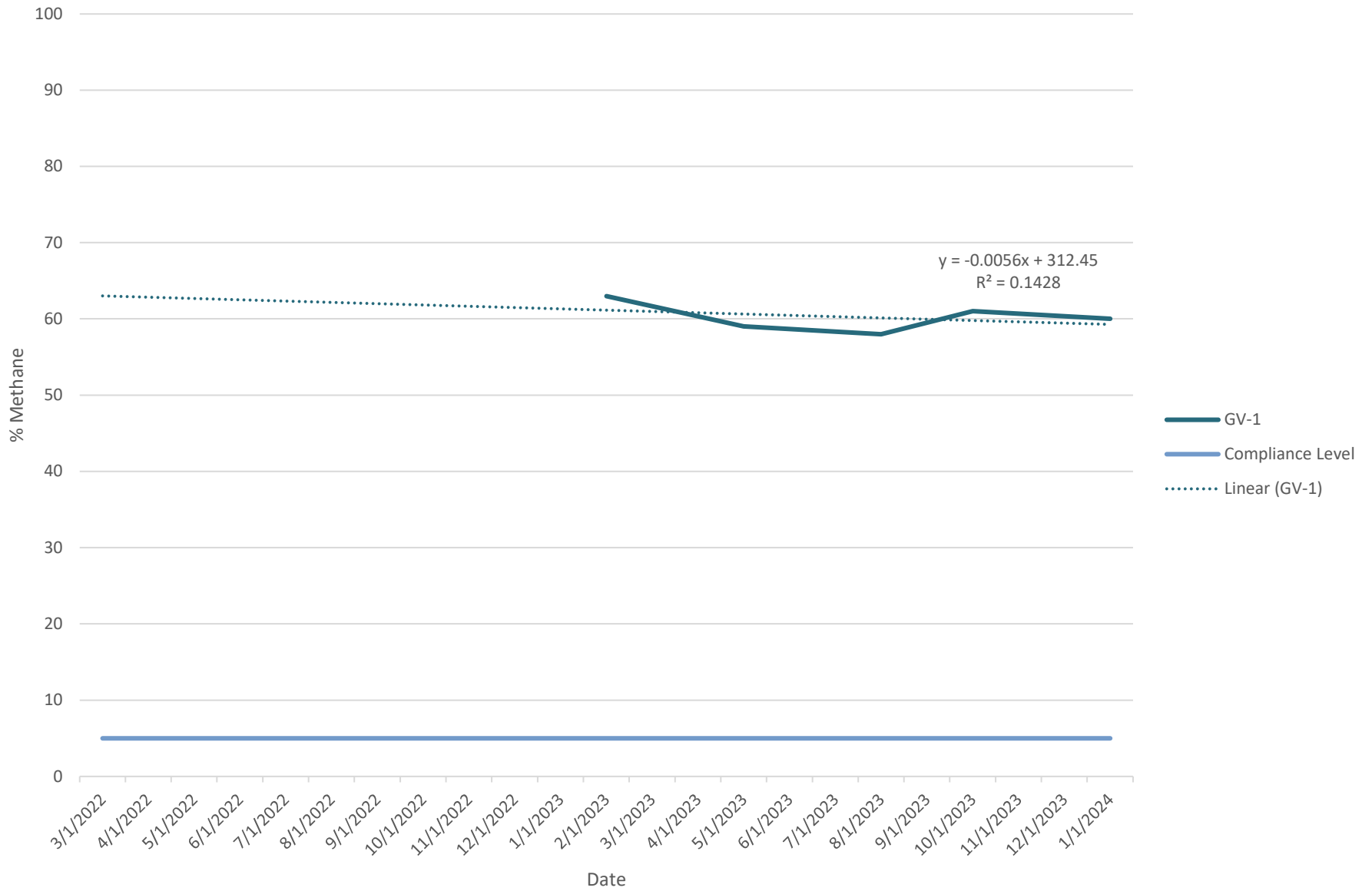




# VP-8 Methane by Volume



# GV-1 Methane by Volume



# GV-2 Methane by Volume

