

December 4, 2024

Mr. Brad Davison
Iowa Department of Natural Resources
502 E. 9th St.
Des Moines, IA 50319

RE: City of Keokuk Sanitary Landfill (Closed)
Permit No. 56-SDP-04-77C
Annual Landfill Monitoring Report

Dear Mr. Davison,

This letter is provided to the Iowa DNR to summarize the 2024 groundwater monitoring, landfill gas monitoring, leachate collection, and engineering inspection results for the Closed Keokuk Sanitary Landfill. In summary, the following was completed at the landfill during 2024:

- Landfill Gas Measurements were recorded on March 4, 2024 at GP1, GP2, and GP3
- An Engineering Inspection was completed on March 4, 2024.
- Groundwater sampling was completed by Klingner and Associates at MW7, MW9, MW12RR, and MW15 for Appendix I parameters in 567 IAC 11 and TSS. A Hydrasleeve™ was set in each well on March 4, 2024, and samples were collected on April 1, 2024.
- 705,700 gallons of leachate was hauled from the landfill between December 2023 and November 2024.
- Fill was added and grading was completed on the berm east of the leachate collection area to address ponding.
- The leachate seep area identified by Iowa DNR in 2023 was addressed with the installation of additional drain tile.

Permit Conditions:

The site permit was issued on September 10, 1992 and permit amendments have been issued including supplemental sampling requirements as stated in PA 4, 5, 6, & 8 (Replaced PA 7). Permit Amendment #8 was issued in a letter dated January 4, 2017 which required one round of groundwater sampling for Appendix I parameters and TSS at eight (8) wells in the spring and semi-annual gas monitoring at three (3) gas probes and two (2) monitoring wells. PA #9 incorporated the Gas Mitigation Trench Installation Report with As-Built into the permit and PA #10 incorporated the abandonment records for MW8 and MW12R. PA #11 was issued on March 6, 2018 and required annual sampling for Appendix 1 parameters and TSS using low flow techniques at all monitoring wells and monthly explosive gas monitoring at all gas probes and MW7, MW8R, MW12RR, MW15, and MW16. No permit amendments were issued in response to the 2018 AWQR. However, the DNR recommended that groundwater sampling be

continued with the same frequency and parameters as the previous year, that explosive gas readings be reduced to quarterly for 2019, that progress continued on a permanent solution for leachate management, and that an additional gas probe be installed. PA #12 was issued on October 29, 2019 and incorporated GP4 into the gas monitoring program. Additionally, PA #12 inadvertently included requirements for monthly landfill gas readings, however Mr. Graesch was contacted and approved the continuance of quarterly gas readings.

This report format comes in response to PA #13 dated March 16, 2022, and subsequent Revised PA #13 dated August 26, 2022 which reduced landfill monitoring and reporting requirements.

The following requirements were set by Permit Amendment #13:

- The permit is extended by two (2) years, until September 10, 2024
- The hydraulic monitoring system plan was reduced to include only wells MW7, MW9, MW12RR, and MW15. Sampling is required for each well on a biennial basis, though at least one well must be sampled in any given year such that the site as a whole is monitored annually.
- Landfill gas will be monitored annually at GP1, GP2, and GP3.
- An annual engineering inspection will be conducted by a professional engineer. The reporting for the inspection is contemporaneous with this report.
- This annual report will detail groundwater results, landfill gas results, leachate collection data, and engineering inspection results. Tables summarizing groundwater, landfill gas, and leachate data are provided with this report.

PA #14 was issued on September 4, 2024. The amendment extends the permit by two (2) years, to September 10, 2026.

Groundwater:

Sampling was conducted at MW7, MW9, MW12RR, and MW15. On March 4, 2024, each well was agitated, purged, and allowed to recharge prior to setting the Hydrasleeve™. On April 1, 2024, the Hydrasleeves™ were retrieved. Field measurements including temperature, pH, and specific conductance were recorded, and samples were placed into lab supplied containers. A table summarizing 2024 groundwater monitoring results as well as a complete lab report are included.

TSS was higher than in the previous two (2) years where Hydrasleeve™ samplers were also used. It is presumed that the TSS fluctuation is due to a variation in purging times and time allowed for settling and recharging prior to setting the Hydrasleeves™ when compared to previous years. Additional purging volume and recharge/settling time will be implemented for future sampling events.

Groundwater levels were measured by Klingner during the annual engineering inspection. A summary of groundwater levels is included.

Inorganics / Metals

Background levels of inorganics are determined using samples collected from MW9 which is the only well considered to be upstream at the site. The following inorganics were found to have either no detects, or detects below the MCL / statewide standards for all wells sampled in 2024:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Nickel
- Selenium
- Silver
- Thallium
- Vanadium
- Zinc

Cobalt

Cobalt was observed to be above the MCL/ statewide standards at MW7, MW9, and MW15, and was detected below the MCL/ statewide standards at MW12RR. Cobalt appears to increase with TSS at MW7, MW9, and MW15. The highest detection of cobalt occurred at MW9, the upgradient well. Cobalt levels above MCL / statewide standards are likely due to naturally occurring cobalt in the surrounding soils. Historically, background levels of cobalt have been observed at MW9 above statewide standards.

Organics

Background levels of inorganics are determined using samples collected from MW9 which is the only well considered to be upstream at the site. The following organics were found to have either no detects, or detects below the MCL / statewide standards for all wells sampled in 2024:

- 1,1,1,2-Tetrachloroethane
- 1,1,1-Trichloroethane
- 1,1,2,2-Tetrachloroethane
- 1,1,2-Trichloroethane
- 1,1-Dichloroethane
- 1,1-Dichloroethene
- 1,2,3-Trichloropropane
- 1,2-Dibromo-3-chloropropane
- 1,2-Dibromoethane
- 1,2-Dichlorobenzene
- 1,2-Dichloroethane
- 1,2-Dichloropropane
- Acetone
- Acrylonitrile
- Benzene
- Bromochloromethane
- Bromodichloromethane
- Bromoform
- Bromomethane
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chloroethane
- Chloroform
- Dibromomethane
- Ethylbenzene
- Iodomethane
- m,p-Xylene
- Methylene chloride
- o-Xylene
- Styrene
- Tetrachloroethene
- Toluene
- trans-1,2-Dichloroethene
- trans-1,3-Dichloropropene
- trans-1,4-Dichloro-2-butene

- 1,4-Dichlorobenzene
- 2-Butanone
- 2-Hexanone
- 4-Methyl-2-pentanone
- Chloromethane
- cis-1,2-Dichloroethene
- cis-1,3-Dichloropropene
- Dibromochloromethane
- Trichlorofluoromethane
- Vinyl acetate
- Vinyl chloride
- Xylenes, Total

Trichloroethene

Trichloroethene was observed to be above the MCL at MW7. No detects of trichloroethene were observed in MW9, MW12RR, or MW15. Historically, trichloroethene has fluctuated at MW7, and no detects at MW9, MW12RR, or MW15, have ever been observed. The last exceedance of trichloroethene was in 2021.

Landfill Gas Monitoring:

Explosive gas levels were measured by Klingner & Associates on March 4, 2024 at GP1, GP2, GP3, and GP4. Explosive gas measurements are collected using a GEM 5000 with tubing attached to a barbed hose fitting on the gas probe caps. A summary of the gas measurements taken in 2024 as well as a historical summary graph is included with this report.

Leachate Collection:

Leachate is collected in a series of holding tanks (total capacity of 10,000 gallons), pumped by the City of Keokuk, and trucked to the City wastewater treatment plant. Leachate volumes hauled are provided in the following table:

Month	Discharged to Keokuk WWTP (gal)	Precipitation (in)
Dec-23	45,500	-
Jan-24	124,100	-
Feb-24	51,200	-
Mar-24	67,800	-
Apr-24	100,700	5.00
May-24	63,600	3.30
Jun-24	42,300	2.40
Jul-24	65,100	9.70
Aug-24	50,400	1.60
Sep-24	34,700	1.70
Oct-24	30,800	2.10
Nov-24	29,500	2.00
2024 Annual Total	705,700	27.80

Pumping of the leachate collection tank is generally completed 2-3 days per week and multiple loads of leachate are pumped in a single day to allow for sufficient storage space. Pumping operations vary based on City staff availabilities.

The City installed a second 1,500-gallon leachate storage tank at the site in June of 2020 to address the need for immediate leachate storage. Two (2) additional 3,500-gallon tanks (7,000 gallons of additional storage capacity) were installed in November of 2020. The current leachate storage capacity has been increased to 10,000 gallons of total storage from 1,500 gallons prior to June of 2020.

Engineering Inspection:

March 4, 2024 Inspection

An annual engineering inspection was conducted at the landfill on March 4, 2024. During the spring inspection, conditions were clear with temperatures around 60 degrees Fahrenheit. The landfill entrance gate was locked. Access roads were well maintained with rock with some erosion noted on the access road by MW12RR and the leachate collection area. Signage at the entrance gate provided the site contact information. The landfill had generally good grass cover. Conditions were dry but evidence of areas that regularly hold water were observed.

The leachate seep area identified by Iowa DNR on May 31, 2023 (Reported to Klingner & the City of Keokuk on August 3, 2023) near the stormwater outfall was observed. No evidence of recent leachate discharges was observed and no odors of leachate were noted in the area. After being notified from The City of Keokuk that brush and trees in the area had been cleared, a follow-up visit was made on April 5, 2024. During the follow-up visit, leachate discharge was observed near the outfall.

2024 Landfill Repairs & Maintenance:

The City of Keokuk entered into a contract on October 10, 2023 with Klingner for surveying and civil/site design services to place fill on the landfill cap to improve drainage throughout the landfill, reduce the quantity of leachate produced due to infiltration, and address the seep identified by Iowa DNR in May of 2023. The City of Keokuk applied for congressional funding for the project in early 2024. Schematic design was completed in June of 2024 and Klingner met with Mr. Brian Rath, Iowa DNR, to discuss the schematic design to ensure that the state was in agreement of the proposed grading plan. Unfortunately, the city was notified that the project was not selected for congressional funding and without funding, the project cannot move forward at this time.

In September 2024, The City of Keokuk mobilized equipment to the landfill to address the leachate seeps observed east of the leachate collection area and near the stormwater outlet. Ms. Jessica Coca, PE, met Mr. Michael Clark, City of Keokuk, at the landfill to perform

exploratory excavation in the area of the observed seep. It was determined that leachate was draining through the rock fill around the storm sewer (solid pipe) leading to discharge near the stormwater outlet at the creek. To address the leachate around the seep, a perforated 4" drain was installed adjacent to the storm sewer backfill and directed to the easternmost leachate holding tank (3500 gallons). To provide sufficient fall to drain into the tank, the line had to be installed approximately 6' below the top of the tank so a backflow preventer valve was installed near the inlet to the tank to prevent leachate from draining into the line when the leachate level in the tank is higher than the inlet for the seep repair.

A concrete collar was poured around the storm sewer at the location where leachate seepage was observed to begin in the backfill to provide a hard barrier in the backfill around the storm sewer to prevent further seepage through the backfill. The area near the stormwater outlet will continue to be monitored to ensure the seep has been addressed by the repairs.

Additionally, since funding could not be secured for grading of the entire landfill cap, the City provided fill at the top of the hill east of the leachate collection area where stormwater regularly ponds in an effort to reduce the amount of infiltration behind the hillside which continues to be the area of most frequent leachate seeps over the last 5 years. The area behind the berm east of the leachate collection area was graded approximately 200 feet out from the storm water intake. Approximately 150 tons of fill material were placed in low areas to address ponding and improve drainage.

The landfill repairs were completed on October 30, 2024.

Conclusion / Recommendations:

At this time, no alterations to the current monitoring plan are recommended. The timeline for future landfill activities is as follows:

- Annual Engineering Inspection in early March, 2025. At this time, gas monitoring, well purging, and setting Hydrasleeves™ will be performed.
- In late March, 2025 or early April, 2025, each well will be sampled by pulling the Hydrasleeve™ device and transferring sample water into laboratory supplied sampling containers.

Please address any correspondence with the City of Keokuk to Mr. Brian Carroll, Public Works Director.

Davison, Brad
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As always, if you have any questions, please do not hesitate to contact us.

Sincerely,

KLINGNER & ASSOCIATES, P.C.

Jessica Coca, P.E.

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C: Becky Jolly, Iowa Department of Natural Resources
Brian Carroll, City of Keokuk

Enclosure: 2024 Groundwater Data Summary
Historic Groundwater Data Summary
Water Level Data
Laboratory Report
Groundwater Sampling Forms
2024 Landfill Gas Data Summary
Historic Landfill Gas Data Summary
2024 Annual Engineering Inspection Documentation

2024 GROUNDWATER DATA SUMMARY

2024 Groundwater Monitoring Summary
City of Keokuk Sanitary Landfill (Closed)
Permit No. 56-SDP-04-77C

April 1, 2024 Groundwater Sampling Results						
Constituent	MCL	SS	MW-7	MW-9 (Upgradient)	MW-12RR	MW-15
Total Suspended Solids (mg/L)	-	-	599	177	196	24
Metals (ug/L)						
Antimony	6	-	<2	<2	<2	<2
Arsenic	10	-	2.71	<1	<2	5.46
Barium	2000	-	479	443	16.5	223
Beryllium	4	-	<1	<1	<1	<1
Cadmium	5	-	0.334	0.344	<1	<1
Chromium	100	-	<5	<5	<5	<5
Cobalt	-	2.8	5.28	6.49	0.649	3.56
Copper	1300	-	<5	<5	<5	<5
Lead	15	-	2.28	1.53	1.56	0.546
Nickel	-	100	7.57	10.9	<5	7.18
Selenium	50	-	<5	23.6	<5	<5
Silver	-	100	<1	<1	<1	<1
Thallium	2	-	<1	<1	<1	<1
Vanadium	-	35	<5	<5	5.97	<5
Zinc	-	2000	<20	<20	<20	<20
Volatile Organics (ug/L)						
1,1,1,2-Tetrachloroethane	-	70	<1	<1	<1	<1
1,1,1-Trichloroethane	280	-	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	-	0.3	<1	<1	<1	<1
1,1,2-Trichloroethane	5	-	<1	<1	<1	<1
1,1-Dichloroethane	-	140	6.7	<1	<1	<1
1,1-Dichloroethene	7	-	<2	<2	<2	<2
1,2,3-Trichloropropane	-	0.0058	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	0.2	-	<5	<5	<5	<5
1,2-Dibromoethane	-	0.05	<1	<1	<1	<1
1,2-Dichlorobenzene	600	-	<1	<1	<1	<1
1,2-Dichloroethane	5	-	<1	<1	<1	<1
1,2-Dichloropropane	5	-	1.77	<1	<1	<1
1,4-Dichlorobenzene	75	-	<1	<1	<1	<1
2-Butanone	-	4000	<10	<10	<10	<10
2-Hexanone	-	-	<10	<10	<10	<10
4-Methyl-2-pentanone	-	560	<10	<10	<10	<10
Acetone	-	6300	<10.0	<10.0	<10.0	<10.0
Acrylonitrile	-	0.32	<5.00	<5.00	<5.00	<5.00
Benzene	5	-	0.649	<0.5	<0.5	<0.5
Bromochloromethane	-	90	<5.00	<5.00	<5.00	<5.00
Bromodichloromethane	-	80	<1.00	<1.00	<1.00	<1.00
Bromoform	-	80	<5.00	<5.00	<5.00	<5.00
Bromomethane	-	10	<4.00	<4.00	<4.00	<4.00

Constituent	MCL	SS	MW-7	MW-9 (Upgradient)	MW-12RR	MW-15
Carbon disulfide	-	700	<1.00	<1.00	<1.00	<1.00
Carbon tetrachloride	5	-	<2.00	<2.00	<2.00	<2.00
Chlorobenzene	100	-	<1.00	<1.00	<1.00	<1.00
Chloroethane	-	2800	<4.00	<4.00	<4.00	<4.00
Chloroform	-	80	<3.00	<3.00	<3.00	<3.00
Chloromethane	-	-	<3.00	<3.00	<3.00	<3.00
cis-1,2-Dichloroethene	70	-	45.6	<1.00	<1.00	9.73
cis-1,3-Dichloropropene	-	-	<5.00	<5.00	<5.00	<5.00
Dibromochloromethane	-	80	<5.00	<5.00	<5.00	<5.00
Dibromomethane	-	70	<1.00	<1.00	<1.00	<1.00
Ethylbenzene	700	-	<1.00	<1.00	<1.00	<1.00
Iodomethane	-	-	<10.0	<10.0	<10.0	<10.0
m,p-Xylene	-	-	<2.00	<2.00	<2.00	<2.00
Methylene chloride	-	5	<5.00	<5.00	<5.00	<5.00
o-Xylene	-	-	<1.00	<1.00	<1.00	<1.00
Styrene	100	-	<1.00	<1.00	<1.00	<1.00
Tetrachloroethene	5	-	<1.00	<1.00	<1.00	<1.00
Toluene	1000	-	<1.00	<1.00	<1.00	<1.00
trans-1,2-Dichloroethene	100	-	<1.00	<1.00	<1.00	<1.00
trans-1,3-Dichloropropene	-	-	<5.00	<5.00	<5.00	<5.00
trans-1,4-Dichloro-2-butene	-	1.8	<10.0	<10.0	<10.0	<10.0
Trichloroethene	5	-	10.3	<1.00	<1.00	<1.00
Trichlorofluoromethane	-	2000	<4.00	<4.00	<4.00	<4.00
Vinyl acetate	-	-	<10.0	<10.0	<10.0	<10.0
Vinyl chloride	2	-	1.66	<1.00	<1.00	<1.00
Xylenes, Total	10	-	<3.00	<3.00	<3.00	<3.00

Bold = Detection

Green = Exceedance of USEPA Maximum Contaminant Level (MCL)

Yellow = Exceedance of Iowa Statewide Standards (SS)

HISTORIC GROUNDWATER DATA SUMMARY

Analytical Data Summary
 2024 Annual Water Quality Report
 Keokuk (Closed) Sanitary Landfill
 Permit No. 56-SDP-04-77

Constituent (CAS #)	Sample Date	Units	MW6 DwnGrad	MW7 DwnGrad	MW8 DwnGrad	MW8R DwnGrad	MW9 Bkgrnd	MW12/R DwnGrad	MW12RR DwnGrad	MW14 DwnGrad	MW15 DwnGrad	MW16 DwnGrad
Antimony (Total) (7440-36-0) MCL = 6	9/22/2008	µg/l	NM	NM	<6	NM	NM	<6	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<3	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	3.6	<3	<3	NM	<3	NM	NM	3.3	<3	<3
	10/4/2016	µg/l	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	3/23/2017	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	9/15/2017	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	3/13/2018	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	8/28/2018	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	3/13/2019	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	9/17/2019	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	3/5/2020	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	9/28/2020	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	3/16/2021	µg/l	<3	<3	NM	<3	<3	NM	<3	<3	<3	<3
	9/28/2021	µg/l	NM	<3	NM	<3	<3	NM	<3	<3	<3	<3
	3/22/2022	µg/l	NM	<3	NM	NM	<3	NM	<5.4	NM	<3	NM
	3/28/2023	µg/l	NM	<3	NM	NM	<3	NM	<3	NM	<3	NM
3/4/2024	µg/l	NM	<2	NM	NM	<2	NM	<2	NM	<2	NM	
Arsenic (Total) (7440-38-2) MCL = 10	9/22/2008	µg/l	NM	NM	10.7	NM	NM	14.4	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	4.4	NM	NM	55.0	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	3.0	NM	NM	32.0	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	4.2	NM	NM	24.0	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	3.4	NM	NM	18.0	NM	NM	NM	NM
	9/16/2011	µg/l	NM	NM	3.8	NM	NM	20.0	NM	NM	NM	NM
	3/28/2012	µg/l	NM	NM	4.1	NM	NM	NM	NM	NM	NM	NM
	9/11/2012	µg/l	NM	NM	4.8	NM	NM	11.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1	NM	NM	NM	NM	NM	NM	NM
	9/5/2013	µg/l	NM	NM	<1	NM	NM	17.0	NM	NM	NM	NM
	3/25/2014	µg/l	NM	NM	NM	NM	NM	5.4	NM	NM	NM	NM
	9/25/2014	µg/l	NM	NM	4.1	NM	NM	11.0	NM	NM	NM	NM
	9/9/2015	µg/l	97.0	1.2	2.0	NM	17.0	NM	NM	12.0	6.0	2.3
	10/4/2016	µg/l	1.0	2.6	10.0	2.5	2.6	5.9	31.0	6.1	3.4	4
	3/23/2017	µg/l	<1	13.0	NM	2.4	1.6	NM	2.3	<1	4.8	2.5
	9/15/2017	µg/l	2.7	1.2	NM	4.7	14.0	NM	70.0	6.0	6.7	3
	3/13/2018	µg/l	1.7	2.3	NM	1.3	2.8	NM	<1	1.4	5.3	2.7
	8/28/2018	µg/l	1.4	2.3	NM	2.1	<1	NM	5.8	<1	5.6	3.2
	3/13/2019	µg/l	<1	2.2	NM	1.2	2.7	NM	1.0	1.0	9.1	4.9
	9/17/2019	µg/l	19	1.1	NM	7.5	2.0	NM	29.0	2.3	<1	4.9
	3/5/2020	µg/l	1.8	1.9	NM	3.5	<1	NM	2.8	1.6	4.7	1.7
	9/28/2020	µg/l	1.9	3.9	NM	3.2	<1	NM	23.0	2.5	4.3	1.6
	3/16/2021	µg/l	2.4	2.5	NM	7.5	<1	NM	2.7	1.6	5.4	1.9
	9/28/2021	µg/l	NM	3.0	NM	7.5	10.0	NM	43.0	2.6	3.6	1.9
3/22/2022	µg/l	NM	2.8	NM	NM	1.7	NM	36.0	NM	6.8	NM	
3/28/2023	µg/l	NM	1.2	NM	NM	<1	NM	9.0	NM	5.8	NM	
3/4/2024	µg/l	NM	2.71	NM	NM	<1	NM	<2	NM	5.46	NM	
Barium (Total) (7440-39-3) MCL = 2000	9/22/2008	µg/l	NM	NM	121	NM	NM	21	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	38	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	790	380	75	NM	980	NM	NM	95	790	130
	10/4/2016	µg/l	130	460	230	38	500	29	210	190	610	150
	3/23/2017	µg/l	140	540	NM	64	640	NM	27	100	360	160
	9/15/2017	µg/l	180	330	NM	160	730	NM	520	130	500	130
	3/13/2018	µg/l	150	380	NM	76	540	NM	18	120	220	140
	8/28/2018	µg/l	150	350	NM	89	450	NM	50	71	200	160
	3/13/2019	µg/l	140	330	NM	110	490	NM	19	46	210	140
	9/17/2019	µg/l	360	380	NM	110	540	NM	290	99	86	800
	3/5/2020	µg/l	180	380	NM	91	450	NM	49	71	180	150
	9/28/2020	µg/l	180	400	NM	89	420	NM	160.0	92.0	570.0	130.0
	3/16/2021	µg/l	190	420	NM	92	460	NM	67.0	77.0	310.0	140.0
	9/28/2021	µg/l	NM	410	NM	95	680	NM	2.8	97.0	630.0	170.0
3/22/2022	µg/l	NM	420	NM	NM	510	NM	490.0	NM	490.0	NM	
3/28/2023	µg/l	NM	360.0	NM	NM	420.0	NM	73.0	NM	120.0	NM	
3/4/2024	µg/l	NM	479	NM	NM	443	NM	16.5	NM	223	NM	
Beryllium (Total) (7440-41-7) MCL = 4	9/22/2008	µg/l	NM	NM	1.2	NM	NM	<1	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1	<1	<1	NM	1.5	NM	NM	<1	<1	<1
	10/4/2016	µg/l	<1	<1	<1	<1	<1	<1	1.6	<1	<1	<1
	3/23/2017	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/15/2017	µg/l	<1	<1	NM	<1	1.4	NM	4.8	<1	<1	<1
	3/13/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
8/28/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	3/13/2019	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/17/2019	µg/l	<1	<1	NM	<1	<1	NM	2.6	<1	<1	<1
	3/5/2020	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/28/2020	µg/l	<1	<1	NM	<1	<1	NM	1.3	<1	<1	<1
	3/16/2021	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/28/2021	µg/l	NM	<1	NM	<1	<1	NM	2.8	<1	<1	<1
	3/22/2022	µg/l	NM	<1	NM	NM	<1	NM	3.9	NM	<1	NM
	3/28/2023	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM
	3/4/2024	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM
Cadmium (Total) (7440-43-9) MCL = 5	9/22/2008	µg/l	NM	NM	6.2	NM	NM	7	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	1	NM	NM	NM	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	<5	NM	NM	NM	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	<5	NM	NM	NM	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	<1	NM	NM	NM	NM	NM	NM	NM
	9/16/2011	µg/l	NM	NM	1.2	NM	NM	NM	NM	NM	NM	NM
	3/28/2012	µg/l	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<5	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	26	<1	1.9	NM	1.6	NM	NM	<1	<1	<1
	10/4/2016	µg/l	<1	1.2	11	<1	<1	<1	1.3	1.6	1.3	<1
	3/23/2017	µg/l	<1	4.3	NM	<1	<1	NM	<1	<1	<1	<1
	9/15/2017	µg/l	<1	<1	NM	<1	1	NM	3.4	<1	<1	<1
	3/13/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	8/28/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	3/13/2019	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/17/2019	µg/l	2.6	1.5	NM	<1	<1	NM	2	<1	<1	<1
	3/5/2020	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/28/2020	µg/l	<1	<1	NM	<1	<1	NM	1.4	<1	<1	<1
	3/16/2021	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/28/2021	µg/l	NM	<1	NM	<1	1.6	NM	3.3	<1	<1	<1
3/22/2022	µg/l	NM	<1	NM	NM	<1	NM	2.6	NM	<1	NM	
3/28/2023	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM	
3/4/2024	µg/l	NM	0.334	NM	NM	0.344	NM	<1	NM	<1	NM	
Chromium (Total) (7440-47-3) MCL = 100	9/22/2008	µg/l	NM	NM	<20	NM	NM	<20	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<4	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	870	<4	6.3	NM	55	NM	NM	4	<4	<4
	10/4/2016	µg/l	<4	6.6	43	<4	5.4	<4	50	22	5.4	4.7
	3/23/2017	µg/l	<4	27	NM	<4	<4	NM	<4	<4	<4	<4
	9/15/2017	µg/l	<4	<4	NM	<4	41	NM	150	5.7	<4	<4
	3/13/2018	µg/l	<4	<4	NM	<4	<4	NM	<4	<4	<4	<4
	8/28/2018	µg/l	<4	<4	NM	<4	<4	NM	11	<4	<4	<4
	3/13/2019	µg/l	<4	<4	NM	<4	5.7	NM	<4	<4	<4	<4
	9/17/2019	µg/l	9	<4	NM	7.5	5.8	NM	81	5.3	<4	<4
	3/5/2020	µg/l	<4	<4	NM	7.8	<4	NM	10	5	<4	<4
	9/28/2020	µg/l	<4	<4	NM	4.2	<4	NM	37.0	<4	<4	<4
	3/16/2021	µg/l	<4	<4	NM	<4	<4	NM	15.0	<4	<4	<4
	9/28/2021	µg/l	NM	<4	NM	4.5	33	NM	80.0	8.1	18	7.2
	3/22/2022	µg/l	NM	<4	NM	NM	7.7	NM	150.0	NM	<4	NM
	3/28/2023	µg/l	NM	<4	NM	NM	<4	NM	21.0	NM	7.5	NM
	3/4/2024	µg/l	NM	<5	NM	NM	<5	NM	<5	NM	<5	NM
Cobalt (Total) (7440-48-4) SS = 2.8	9/22/2008	µg/l	NM	NM	<2	NM	NM	21.5	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	2.2	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	200	<5	4.3	NM	44	NM	NM	6	14	9.6
	10/4/2016	µg/l	<2	8.1	16	5	2.9	2.4	30	9	4.3	13
	3/23/2017	µg/l	<2	28	NM	24	4.3	NM	<2	<2	<2	5.8
	9/15/2017	µg/l	3.2	3.3	NM	31	34	NM	61	2.5	6.2	8.2
	3/13/2018	µg/l	<2	3.8	NM	18	4.2	NM	<2	<2	<2	6.5
	8/28/2018	µg/l	<2	2.6	NM	23	<2	NM	4.3	<2	<2	6.1
	3/13/2019	µg/l	<2	<2	NM	19.0	3.5	NM	<2	<2	3	<2
	9/17/2019	µg/l	11	2.9	NM	21	9	NM	38	3	9	3.4
	3/5/2020	µg/l	11	2.1	NM	19	<2	NM	<2	<2	4.2	5.2
	9/28/2020	µg/l	6.4	2.8	NM	26	<2	NM	22.0	<2	7.4	5.1
	3/16/2021	µg/l	6.3	<2	NM	25	<2	NM	2.5	<2	5.4	5.5
	9/28/2021	µg/l	NM	3.1	NM	30	38	NM	40.0	<2	7.6	6.1
	3/22/2022	µg/l	NM	5.1	NM	NM	6.8	NM	47.0	NM	9.5	NM
	3/28/2023	µg/l	NM	<2	NM	NM	<2	NM	7.0	NM	3.3	NM
	3/4/2024	µg/l	NM	5.28	NM	NM	6.49	NM	0.649	NM	3.56	NM
Copper (Total) (7440-50-8) MCL = 1300	9/22/2008	µg/l	NM	NM	37.4	NM	NM	<20	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	9.5	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	330	<3	54	NM	53	NM	NM	5.7	6.4	<3
	10/4/2016	µg/l	<3	17	410	4.9	4.7	<3	55	26	8.8	9.3
	3/23/2017	µg/l	<3	46	NM	3.6	<3	NM	<3	<3	4.6	<3
	9/15/2017	µg/l	5.7	<3	NM	6.8	36	NM	140	11	4.8	7.7
3/13/2018	µg/l	<3	<3	NM	5	<3	NM	<3	<3	<3	<3	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	8/28/2018	µg/l	<3	<3	NM	4.6	<3	NM	11	<3	<3	<3
	3/13/2019	µg/l	<3	<3	NM	4.5	7.8	NM	<3	<3	<3	<3
	9/17/2019	µg/l	53	<3	NM	4.7	4.6	NM	78	4.9	<3	<3
	3/5/2020	µg/l	<3	<3	NM	6.3	<3	NM	4.5	3.5	<3	<3
	9/28/2020	µg/l	<3	<3	NM	<3	<3	NM	48.0	<3	<3	<3
	3/16/2021	µg/l	3.1	<3	NM	4.2	3.8	NM	7.8	4.9	<3	3.9
	9/28/2021	µg/l	NM	<3	NM	<3	40	NM	78.0	23.0	<3	<3
	3/22/2022	µg/l	NM	<3	NM	NM	4.8	NM	99.0	NM	<3	NM
	3/28/2023	µg/l	NM	<3	NM	NM	<3	NM	16.0	NM	<3	NM
	3/4/2024	µg/l	NM	<5	NM	NM	<5	NM	<5	NM	<5	NM
Lead (Total) (7439-92-1) MCL = 15	9/22/2008	µg/l	NM	NM	11.5	NM	NM	<40	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	55	<1	2.5	NM	24	NM	NM	2.7	2.3	<1
	10/4/2016	µg/l	<1	3.8	2.1	<1	1.9	<1	28	15	4.1	5.4
	3/23/2017	µg/l	<1	15	NM	<1	<1	NM	<1	<1	<1	<1
	9/15/2017	µg/l	1.1	<1	NM	2.5	23	NM	75	4.7	3.7	4
	3/13/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	8/28/2018	µg/l	<1	<1	NM	<1	<1	NM	4.8	<1	<1	<1
	3/13/2019	µg/l	<1	<1	NM	1.9	3.2	NM	<1	<1	1	<1
	9/17/2019	µg/l	11	<1	NM	2.1	3.1	NM	42	2	<1	<1
	3/5/2020	µg/l	<1	<1	NM	1.4	<1	NM	2.2	1.3	1.3	<1
	9/28/2020	µg/l	<1	<1	NM	<1	<1	NM	25.0	<1	<1	<1
	3/16/2021	µg/l	<1	<1	NM	<1	<1	NM	2.3	1.0	<1	<1
	9/28/2021	µg/l	NM	<1	NM	<1	18	NM	45.0	4.1	<1	<1
	3/22/2022	µg/l	NM	<1	NM	NM	2.4	NM	56.0	NM	<1	NM
3/28/2023	µg/l	NM	<1	NM	NM	3.1	NM	9.8	NM	1.7	NM	
3/4/2024	µg/l	NM	2.28	NM	NM	1.53	NM	1.56	NM	0.546	NM	
Nickel (Total) (7440-02-0) SS = 100	9/22/2008	µg/l	NM	NM	57.9	NM	NM	<50	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	18	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	800	8.1	23.0	NM	96	NM	NM	34	18	17
	10/4/2016	µg/l	<5	28	68	17	14	<5	84	27	12	33
	3/23/2017	µg/l	<5	64.0	NM	54	14	NM	<5	<5	9.6	14
	9/15/2017	µg/l	7.0	5.4	NM	46	68	NM	170	5.8	11.0	16
	3/13/2018	µg/l	<5	<5	NM	48	8.2	NM	<5	<5	7.1	8.8
	8/28/2018	µg/l	<5	<5	NM	51	<5	NM	12	<5	<5	9
	3/13/2019	µg/l	<5	<5	NM	36.0	8.6	NM	<5	<5	12	21
	9/17/2019	µg/l	30	5.7	NM	50	21	NM	110	6	13	7.4
	3/5/2020	µg/l	31	<5	NM	51	6.3	NM	8.1	<5	8.5	8.9
	9/28/2020	µg/l	14	<5	NM	53.0	<5	NM	59.0	<5	<5	7.5
	3/16/2021	µg/l	11	<5	NM	50.0	<5	NM	13.0	<5	7.6	8.7
	9/28/2021	µg/l	NM	5.5	NM	49.0	57.0	NM	100.0	6.8	17.0	11.0
	3/22/2022	µg/l	NM	10.0	NM	NM	13	NM	140.0	NM	14.0	NM
3/28/2023	µg/l	NM	<5	NM	NM	<5	NM	22.0	NM	7.6	NM	
3/4/2024	µg/l	NM	7.57	NM	NM	10.9	NM	<5	NM	7.18	NM	
Selenium (Total) (7782-49-2) MCL = 50	9/22/2008	µg/l	NM	NM	<50	NM	NM	<25	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	1.4	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	9.1	<1	1.5	NM	9.2	NM	NM	<1	<1	35
	10/4/2016	µg/l	<1	2.1	4.6	<1	13	<1	5.1	2.2	<1	16
	3/23/2017	µg/l	<1	14	NM	1.2	7.1	NM	<1	<1	<1	5.6
	9/15/2017	µg/l	<1	<1	NM	<1	4.9	NM	11	<1	<1	27
	3/13/2018	µg/l	<1	<1	NM	<1	6.8	NM	<1	<1	<1	1.7
	8/28/2018	µg/l	<1	<1	NM	<1	16	NM	1.3	<1	<1	2.6
	3/13/2019	µg/l	<1	<1	NM	<1	17.0	NM	<1	<1	<1	16
	9/17/2019	µg/l	1.4	<1	NM	1	18	NM	11	<1	<1	31
	3/5/2020	µg/l	<1	<1	NM	<1	23	NM	<1	<1	<1	1.2
	9/28/2020	µg/l	<1	<1	NM	<1	19.0	NM	3.7	<1	<1	4.0
	3/16/2021	µg/l	<1	<1	NM	<1	24.0	NM	<1	<1	<1	1.6
	9/28/2021	µg/l	NM	<1	NM	<1	18.0	NM	6.9	<1	<1	<1
	3/22/2022	µg/l	NM	<1	NM	NM	22	NM	5.4	NM	<1	NM
3/28/2023	µg/l	NM	<1	NM	NM	16.0	NM	1.4	NM	<1	NM	
3/4/2024	µg/l	NM	<5	NM	NM	23.6	NM	<5	NM	<5	NM	
Silver (Total) (7440-22-4) SS = 100	9/22/2008	µg/l	NM	NM	<20	NM	NM	<20	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	26	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<5	<5	<5	NM	<5	NM	NM	<5	<5	<5
	10/4/2016	µg/l	<5	<5	<5	<5	7.2	13	<5	<5	<5	<5
	3/23/2017	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	9/15/2017	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	3/13/2018	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	8/28/2018	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	3/13/2019	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	9/17/2019	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
3/5/2020	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5	
9/28/2020	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	3/16/2021	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	9/28/2021	µg/l	NM	<5	NM	<5	<5	NM	<5	<5	<5	<5
	3/22/2022	µg/l	NM	<5	NM	NM	<5	NM	<5	NM	<5	NM
	3/28/2023	µg/l	NM	<5	NM	NM	<5	NM	<5	NM	<5	NM
	3/4/2024	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM
Thallium (Total) (7440-28-0) MCL = 2	9/22/2008	µg/l	NM	NM	<2	NM	NM	<2	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	1.9	<1	<1	NM	<1	NM	NM	<1	<1	<1
	10/4/2016	µg/l	<1	<1	2.2	<1	<1	<1	2.3	<1	<1	<1
	3/23/2017	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/15/2017	µg/l	<1	<1	NM	<1	<1	NM	2.5	<1	<1	<1
	3/13/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	8/28/2018	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	3/13/2019	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/17/2019	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	3/5/2020	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	9/28/2020	µg/l	<1	<1	NM	<1	<1	NM	<1	<1	<1	<1
	3/16/2021	µg/l	<1	<1	NM	<1	<1	NM	1.3	1.2	1.6	<1
	9/28/2021	µg/l	NM	<1	NM	<1	<1	NM	1.6	<1	<1	<1
3/22/2022	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM	
3/28/2023	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM	
3/4/2024	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM	
Vanadium (Total) (7440-62-2) SS = 35	9/22/2008	µg/l	NM	NM	<50	NM	NM	<50	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<5	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	71	<5	11	NM	86	NM	NM	<5	<5	<5
	10/4/2016	µg/l	<5	10	68	<5	10	<5	83	30	8.5	8.9
	3/23/2017	µg/l	<5	38	NM	<5	<5	NM	<5	<5	<5	<5
	9/15/2017	µg/l	<5	<5	NM	<5	68	NM	230	5.4	6.2	6.8
	3/13/2018	µg/l	<5	<5	NM	<5	<5	NM	<5	<5	<5	<5
	8/28/2018	µg/l	<5	<5	NM	<5	<5	NM	19	<5	<5	<5
	3/13/2019	µg/l	<5	<5	NM	<5	12.0	NM	5.7	5.7	<5	<5
	9/17/2019	µg/l	12	<5	NM	12	8.4	NM	120	6.1	<5	<5
	3/5/2020	µg/l	<5	<5	NM	<5	<5	NM	6.7	<5	<5	<5
	9/28/2020	µg/l	<5	<5	NM	<5	<5	NM	58	<5	<5	<5
	3/16/2021	µg/l	<5	<5	NM	<5	<5	NM	12	<5	<5	<5
	9/28/2021	µg/l	NM	<5	NM	<5	44.0	NM	120	13.0	<5	<5
3/22/2022	µg/l	NM	<5	NM	NM	12	NM	240.0	NM	<5	NM	
3/28/2023	µg/l	NM	<5	NM	NM	<5	NM	35.0	NM	5.8	NM	
3/4/2024	µg/l	NM	<5	NM	NM	<5	NM	5.97	NM	<5	NM	
Zinc (Total) (7440-66-6) SS = 2000	9/22/2008	µg/l	NM	NM	116	NM	NM	73.8	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	7.5	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	810	180	20	NM	120.0	NM	NM	11.0	<6	<6
	10/4/2016	µg/l	<6	29	150	31	12	11	170	46	14	14
	3/23/2017	µg/l	<6	110	NM	30	<6	NM	<6	<6	7.6	<6
	9/15/2017	µg/l	8.7	6	NM	16	95	NM	440	11	16	14
	3/13/2018	µg/l	<6	<6	NM	12	<6	NM	<6	<6	<6	<6
	8/28/2018	µg/l	<6	<6	NM	9.9	<6	NM	33	<6	<6	<6
	3/13/2019	µg/l	7.4	<6	NM	11.0	23.0	NM	<6	<6	<6	6.3
	9/17/2019	µg/l	50.0	6.0	NM	15.0	13.0	NM	230	11.0	<6	6.4
	3/5/2020	µg/l	56.0	19.0	NM	21.0	76.0	NM	16	9.5	16.0	<6
	9/28/2020	µg/l	27.0	9.6	NM	13.0	50.0	NM	170	<6	9.4	<6
	3/16/2021	µg/l	18.0	6.1	NM	13.0	27.0	NM	20	8.4	7.2	9.1
	9/28/2021	µg/l	NM	<6	NM	21.0	120.0	NM	340	32.0	13.0	<6
3/22/2022	µg/l	NM	<6	NM	NM	29	NM	340.0	NM	11.0	NM	
3/28/2023	µg/l	NM	<6	NM	NM	16.0	NM	50.0	NM	<6	NM	
3/4/2024	µg/l	NM	<20	NM	NM	<20	NM	<20	NM	<20	NM	
Total Suspended Solids (TSS)	10/14/2016	mg/l	7.2	6.4	4.8	<4	37	<4	<4	<4	11	<4
	3/23/2017	mg/l	<4	<4	NM	<4	<4	NM	<4	<4	<4	<4
	9/15/2017	mg/l	<4	<4	NM	<4	15.0	NM	8.4	<4	4.0	21.0
	3/13/2018	mg/l	<4	<4	NM	<4	8.8	NM	<4	<4	<4	<4
	8/28/2018	mg/l	<4	4.0	NM	<4	<4	NM	<4	<4	<4	4.4
	3/13/2019	mg/l	<4	9.2	NM	97.0	60.0	NM	28.0	<4	8.8	17.0
	9/17/2019	mg/l	290.0	7.6	NM	190.0	130.0	NM	2900.0	32.0	14.0	20.0
	3/5/2020	mg/l	4.8	4.0	NM	62.0	12.0	NM	120.0	82.0	32.0	5.6
	9/28/2020	mg/l	6.4	4.8	NM	30.0	8.8	NM	1400.0	18.0	24.0	6.4
	3/16/2021	mg/l	<4	<4	NM	22.0	6.4	NM	47.0	20.0	5.6	<4
	9/28/2021	mg/l	NM	4.8	NM	34.0	600.0	NM	800.0	70.0	8.0	<4
	3/22/2022	mg/l	NM	<4	NM	NM	42	NM	1600.0	NM	22.0	NM
	3/28/2023	mg/l	NM	<4	NM	NM	4.0	NM	460.0	NM	29.0	NM
	3/4/2024	mg/l	NM	599.0	NM	NM	177.0	NM	196.0	NM	24.0	NM
Acetone (67-64-1) SS = 6300	9/22/2008	µg/l	NM	NM	<10.0	NM	NM	<10.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<5.0	NM	NM	NM	NM	NM	NM	NM

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	9/9/2015	µg/l	15	<5.0	<5.0	NM	<5.0	NM	NM	11	6.2	<5.0
	10/4/2016	µg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/23/2017	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	9/15/2017	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	3/13/2018	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	8/28/2018	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	3/13/2019	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	9/17/2019	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	3/5/2020	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	9/28/2020	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	3/16/2021	µg/l	<5.0	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	9/28/2021	µg/l	NM	<5.0	NM	<5.0	<5.0	NM	<5.0	<5.0	<5.0	<5.0
	3/22/2022	µg/l	NM	<5.0	NM	NM	<5.0	NM	<5.0	NM	<5.0	NM
	3/28/2023	µg/l	NM	<5.0	NM	NM	<5.0	NM	<5.0	NM	<5.0	NM
	3/4/2024	µg/l	NM	<10.0	NM	NM	<10.0	NM	<10.0	NM	<10.0	NM
Acrylonitrile (107-13-1) SS = 0.32	9/22/2008	µg/l	NM	NM	<10.0	NM	NM	<10.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<10	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<10	<10	<10	NM	<10	NM	NM	<10	<10	<10
	10/4/2016	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/23/2017	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	9/15/2017	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	3/13/2018	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	8/28/2018	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	3/13/2019	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	9/17/2019	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	3/5/2020	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	9/28/2020	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	3/16/2021	µg/l	<10	<10	NM	<10	<10	NM	<10	<10	<10	<10
	9/28/2021	µg/l	NM	<10	NM	<10	<10	NM	<10	<10	<10	<10
	3/22/2022	µg/l	NM	<10	NM	NM	<10	NM	<10	NM	<10	NM
3/28/2023	µg/l	NM	<10	NM	NM	<10	NM	<10	NM	<10	NM	
3/4/2024	µg/l	NM	<5.00	NM	NM	<5.00	NM	<5.00	NM	<5.00	NM	
Benzene (71-43-2) MCL = 5	9/22/2008	µg/l	NM	NM	1.3	NM	NM	2	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	<5	NM	NM	<5	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	<5	NM	NM	<5	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	<5	NM	NM	<5.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	1.4	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	1.1	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	1	<1.0	NM	<1.0	<1.0	1.5	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/4/2024	µg/l	NM	0.649	NM	NM	<0.5	NM	<0.5	NM	<0.5	NM	
Bromochloromethane (74-97-5) SS = 90	9/22/2008	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/4/2024	µg/l	NM	<5.00	NM	NM	<5.00	NM	<5.00	NM	<5.00	NM	
Bromodichloromethane (75-27-4) SS = 80	9/22/2008	µg/l	NM	NM	<1.0	NM	NM	<1.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/4/2024	µg/l	NM	<1.00	NM	NM	<1.00	NM	<1.00	NM	<1.00	NM	
Chloroethane; Ethyl chloride (75-00-3) SS = 2800	9/22/2008	µg/l	NM	NM	5	NM	NM	7.6	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	<10	NM	NM	<10	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	<10	NM	NM	<10	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	<10	NM	NM	<10	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	<10	NM	NM	<10	NM	NM	NM	NM
	9/16/2011	µg/l	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	4.5	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	9.9	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	2	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	1.9	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	1.7	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	2.1	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	2.6	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	2.9	NM	2.0	<1.0	NM	<1.0	<1.0	1.4	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1	<1.0	NM	<1.0	2.0	<1.0	<1.0
	9/28/2021	µg/l	NM	1.5	NM	1.8	<1.0	NM	<1.0	<1.0	1.2	<1.0
	3/22/2022	µg/l	NM	1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/4/2024	µg/l	NM	<4.00	NM	NM	<4.00	NM	<4.00	NM	<4.00	NM	
Chloroform; Trichloromethane (67-66-3) SS = 80	9/22/2008	µg/l	NM	NM	<1.0	NM	NM	<1.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/4/2024	µg/l	NM	<3.00	NM	NM	<3.00	NM	<3.00	NM	<3.00	NM	
Dibromochloromethane (124-48-1) SS = 80	9/22/2008	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/4/2024	µg/l	NM	<5.00	NM	NM	<5.00	NM	<5.00	NM	<5.00	NM	
1,2-Dibromo-3-chloropropane (96-12-8) DBCP MCL - 0.2	9/22/2008	µg/l	NM	NM	<0.9	NM	NM	<0.9	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	10/4/2016	µg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	3/23/2017	µg/l	<0.05	<0.05	NM	<0.05	<0.05	NM	<0.05	<0.05	<0.05	<0.05
	9/15/2017	µg/l	<0.05	<0.05	NM	<0.05	<0.05	NM	<0.05	<0.05	<0.05	<0.05
	3/13/2018	µg/l	<0.05	<0.05	NM	<0.05	<0.05	NM	<0.05	<0.05	<0.05	<0.05
8/28/2018	µg/l	<0.05	<0.05	NM	<0.05	<0.05	NM	<0.05	<0.05	<0.05	<0.05	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<2.5	NM	NM	<2.5	NM	<2.5	NM	<2.5	NM
	3/28/2023	µg/l	NM	<2.5	NM	NM	<2.5	NM	<2.5	NM	<2.5	NM
	3/4/2024	µg/l	NM	<10.0	NM	NM	<10.0	NM	<10.0	NM	<10.0	NM
1,1-Dichloroethane (75-34-3) SS = 140	9/22/2008	µg/l	NM	NM	6.9	NM	NM	36.4	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	6.7	NM	NM	15	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	7.9	NM	NM	6.8	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	12	NM	NM	28	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	9.5	NM	NM	15	NM	NM	NM	NM
	12/6/2011	µg/l	NM	NM	10	NM	NM	26	NM	NM	NM	NM
	3/28/2012	µg/l	NM	NM	8.4	NM	NM	NM	NM	NM	NM	NM
	9/11/2012	µg/l	NM	NM	8	NM	NM	<5.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	7.7	NM	NM	NM	NM	NM	NM	NM
	9/5/2013	µg/l	NM	NM	5.4	NM	NM	<5.0	NM	NM	NM	NM
	3/25/2014	µg/l	NM	NM	NM	NM	NM	<5.0	NM	NM	NM	NM
	9/24/2014	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	8.6	8.5	NM	<1.0	NM	NM	3	4.4	<1.0
	10/4/2016	µg/l	<1.0	4.2	5.3	<1.0	<1.0	<1.0	<1.0	2.1	2.8	<1.0
	3/23/2017	µg/l	<1.0	5.3	NM	1.4	<1.0	NM	<1.0	<1.0	2	<1.0
	9/15/2017	µg/l	<1.0	7.4	NM	1.3	<1.0	NM	<1.0	1.1	6.2	<1.0
	3/13/2018	µg/l	<1.0	5	NM	1.3	<1.0	NM	<1.0	1.6	<1.0	<1.0
	8/28/2018	µg/l	<1.0	4.2	NM	<1.0	<1.0	NM	<1.0	<1.0	1.3	<1.0
	3/13/2019	µg/l	<1.0	2.9	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	5.4	NM	2.1	<1.0	NM	<1.0	<1.0	8	<1.0
	3/5/2020	µg/l	<1.0	2	NM	1.8	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	2.4	NM	2.1	<1.0	NM	<1.0	<1.0	6.8	<1.0
	3/16/2021	µg/l	<1.0	1.4	NM	<1	<1.0	NM	<1.0	1.9	2.2	<1.0
	9/28/2021	µg/l	NM	4.8	NM	2.1	<1.0	NM	<1.0	<1.0	6.0	<1.0
	3/22/2022	µg/l	NM	4.3	NM	NM	<1.0	NM	<1.0	NM	2.8	NM
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/4/2024	µg/l	NM	6.7	NM	NM	<1	NM	<1	NM	<1	NM	
1,2-Dichloroethane (107-06-2) MCL = 5	9/22/2008	µg/l	NM	NM	<1.0	NM	NM	<1.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	1.6	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	NM	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	NM	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM
3/4/2024	µg/l	NM	<1	NM	NM	<1	NM	<1	NM	<1	NM	
1,1-Dichloroethylene (75-35-4) 1,1-Dichloroethene MCL = 7	9/22/2008	µg/l	NM	NM	<2.0	NM	NM	<2.0	NM	NM	NM	NM
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0
3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/4/2024	µg/l	NM	6.7	NM	NM	<1	NM	<1	NM	<1	NM	
cis-1,2-Dichloroethylene (156-59-2) MCL - 70	9/22/2008	µg/l	NM	NM	9.6	NM	NM	2.8	NM	NM	NM	NM
	9/16/2009	µg/l	NM	NM	8.4	NM	NM	5.0	NM	NM	NM	NM
	3/17/2010	µg/l	NM	NM	<5	NM	NM	9.7	NM	NM	NM	NM
	9/22/2010	µg/l	NM	NM	15.0	NM	NM	<5	NM	NM	NM	NM
	3/16/2011	µg/l	NM	NM	14.0	NM	NM	<5.0	NM	NM	NM	NM
	12/6/2011	µg/l	NM	NM	16.0	NM	NM	<5.0	NM	NM	NM	NM
	3/28/2012	µg/l	NM	NM	12.0	NM	NM	NM	NM	NM	NM	NM
9/11/2012	µg/l	NM	NM	12.0	NM	NM	NM	NM	NM	NM	NM	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16	
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad	
	3/22/2013	µg/l	NM	NM	13.0	NM	NM	NM	NM	NM	NM	NM	
	9/5/2013	µg/l	NM	NM	8.6	NM	NM	NM	NM	NM	NM	NM	
	9/24/2014	µg/l	NM	NM	8.1	NM	NM	NM	NM	NM	NM	NM	
	9/9/2015	µg/l	<1.0	29.0	14.0	NM	<1.0	NM	NM	4.2	32.0	7.9	
	10/4/2016	µg/l	<1.0	20.0	8.9	1.2	<1.0	<1.0	<1.0	2.9	<1.0	4.0	
	3/23/2017	µg/l	<1.0	23.0	NM	3.2	<1.0	NM	<1.0	<1.0	12.0	2.7	
	9/15/2017	µg/l	<1.0	23.0	NM	3.6	<1.0	NM	<1.0	3.3	50.0	6.0	
	3/13/2018	µg/l	<1.0	24.0	NM	3.0	<1.0	NM	<1.0	3.5	14.0	7.5	
	8/28/2018	µg/l	<1.0	19.0	NM	4.4	<1.0	NM	<1.0	<1.0	6.2	5.6	
	3/13/2019	µg/l	<1.0	16.0	NM	1.5	<1.0	NM	<1.0	<1.0	6.3	2.2	
	9/17/2019	µg/l	<1.0	19.0	NM	4.7	<1.0	NM	<1.0	<1.0	110.0	8.7	
	3/5/2020	µg/l	<1.0	36.0	NM	2.9	<1.0	NM	<1.0	<1.0	11.0	11.0	
	9/28/2020	µg/l	<1.0	32.0	NM	4.0	<1.0	NM	<1.0	<1.0	66.0	9.5	
	3/16/2021	µg/l	<1.0	28.0	NM	<1	<1.0	NM	<1.0	3.5	33.0	6.0	
	9/28/2021	µg/l	NM	35.0	NM	4.1	<1.0	NM	<1.0	<1.0	52.0	9.0	
	3/22/2022	µg/l	NM	29.0	NM	NM	3.9	NM	1.1	NM	37.0	NM	
	3/28/2023	µg/l	NM	4.6	NM	NM	<1.0	NM	<1.0	NM	4.3	NM	
	3/4/2024	µg/l	NM	45.6	NM	NM	<1.00	NM	<1.00	NM	9.73	NM	
	trans-1,2-Dichloroethylene (156-60-5) trans-1,2-Dichloroethene MCL = 100	9/22/2008	µg/l	NM	NM	<1.0	NM	NM	<1.0	NM	NM	NM	NM
		3/22/2013	µg/l	NM	NM	1.4	NM	NM	NM	NM	NM	NM	NM
9/9/2015		µg/l	<1.0	<1.0	1.1	NM	<1.0	NM	NM	<1.0	<1.0	<1.0	
10/4/2016		µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
3/23/2017		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
9/15/2017		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/13/2018		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
8/28/2018		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/13/2019		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
9/17/2019		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/5/2020		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
9/28/2020		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/16/2021		µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
9/28/2021		µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/22/2022		µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM		
3/4/2024	µg/l	NM	<1.00	NM	NM	<1.00	NM	<1.00	NM	<1.00	NM		
1,2-Dichloropropane (78-87-5) MCL = 5	9/22/2008	µg/l	NM	NM	<1.0	NM	NM	<1.0	NM	NM	NM	NM	
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM	
	9/9/2015	µg/l	<1.0	1.7	<1.0	NM	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/23/2017	µg/l	<1.0	1.2	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/15/2017	µg/l	<1.0	1.6	NM	<1.0	<1.0	NM	<1.0	<1.0	1.4	<1.0	
	3/13/2018	µg/l	<1.0	1.1	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	8/28/2018	µg/l	<1.0	1.1	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/17/2019	µg/l	<1.0	1.4	NM	<1.0	<1.0	NM	<1.0	<1.0	2.6	<1.0	
	3/5/2020	µg/l	<1.0	1.5	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/28/2020	µg/l	<1.0	1.4	NM	<1.0	<1.0	NM	<1.0	<1.0	1.8	<1.0	
	3/16/2021	µg/l	<1.0	1.3	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/28/2021	µg/l	NM	1.4	NM	<1.0	<1.0	NM	<1.0	<1.0	1.6	<1.0	
	3/22/2022	µg/l	NM	1.2	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM		
3/4/2024	µg/l	NM	1.77	NM	NM	<1	NM	<1	NM	<1	NM		
cis-1,3-Dichloropropene (10061-01-5)	9/22/2008	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM	
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM	
	3/25/2014	µg/l	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0	
	10/4/2016	µg/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
	3/23/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/15/2017	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/28/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/16/2021	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/28/2021	µg/l	NM	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
3/22/2022	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM		
3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM		
3/4/2024	µg/l	NM	<5.00	NM	NM	<5.00	NM	<5.00	NM	<5.00	NM		
trans-1,3-Dichloropropene (10061-02-6)	9/22/2008	µg/l	NM	NM	<5.0	NM	NM	<5.0	NM	NM	NM	NM	
	3/22/2013	µg/l	NM	NM	<1.0	NM	NM	NM	NM	NM	NM	NM	
	9/9/2015	µg/l	<1.0	<1.0	<1.0	NM	<1.0	NM	NM	<1.0	<1.0	<1.0	

Constituent (CAS #)	Sample Date	Units	MW6	MW7	MW8	MW8R	MW9	MW12/R	MW12RR	MW14	MW15	MW16	
			DwnGrad	DwnGrad	DwnGrad	DwnGrad	Bkgrnd	DwnGrad	DwnGrad	DwnGrad	DwnGrad	DwnGrad	
	9/15/2017	µg/l	<1.0	1	NM	<1.0	<1.0	NM	<1.0	<1.0	4.3	<1.0	
	3/13/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	8/28/2018	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/13/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/17/2019	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	3/5/2020	µg/l	<1.0	<1.0	NM	<1.0	<1.0	NM	<1.0	<1.0	<1.0	<1.0	
	9/28/2020	µg/l	<1.0	3.6	NM	<1.0	<1.0	NM	<1.0	<1.0	9.1	<1.0	
	3/16/2021	µg/l	<1.0	3.8	NM	<1.0	<1.0	NM	<1.0	<1.0	2.1	<1.0	
	9/28/2021	µg/l	NM	2.9	NM	<1.0	<1.0	NM	<1.0	<1.0	9.8	<1.0	
	3/22/2022	µg/l	NM	2.5	NM	NM	<1.0	NM	<1.0	NM	3.8	NM	
	3/28/2023	µg/l	NM	<1.0	NM	NM	<1.0	NM	<1.0	NM	<1.0	NM	
	3/4/2024	µg/l	NM	1.66	NM	NM	<1.00	NM	<1.00	NM	<1.00	NM	
	Xylene (total) (1330-20-7) MCL = 10	9/22/2008	µg/l	NM	NM	<3.0	NM	NM	<3.0	NM	NM	NM	NM
		3/22/2013	µg/l	NM	NM	<2.9	NM	NM	NM	NM	NM	NM	NM
9/9/2015		µg/l	<3.0	<3.0	<3.0	NM	<3.0	NM	NM	<3.0	<3.0	<3.0	
10/4/2016		µg/l	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
3/23/2017		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
9/15/2017		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
3/13/2018		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
8/28/2018		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
3/13/2019		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
9/17/2019		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
3/5/2020		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
9/28/2020		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
3/16/2021		µg/l	<3.0	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
9/28/2021		µg/l	NM	<3.0	NM	<3.0	<3.0	NM	<3.0	<3.0	<3.0	<3.0	
3/22/2022	µg/l	NM	<3.0	NM	NM	<3.0	NM	<3.0	NM	<3.0	NM		
3/28/2023	µg/l	NM	<3.0	NM	NM	<3.0	NM	<3.0	NM	<3.0	NM		
3/4/2024	µg/l	NM	<3.00	NM	NM	<3.00	NM	<3.00	NM	<3.00	NM		

Key:
Detections are in bold
MCL = USEPA Maximum Contaminant Level
SS = Iowa Statewide Standards

Comments:
This is landfill data since December 2007.

This worksheet;
1) Determines if 5 samples for a new well and/or new contaminant have been collected within 1 year.
2) Determines if resamples are being collected within 90 days.
3) Looks for gaps in data record and if an explanation for those gaps was prepared.
4) Ensures that DQR is being correctly applied.
5) Examines if RLs are reasonable and if they have changed over the course of the project.

WATER LEVEL DATA

**HISTORIC WATER LEVEL MEASUREMENTS
CITY OF KEOKUK LANDFILL (CLOSED)**

DATE	MW6	MW7	MW8	MW8R	MW9	MW12	MW12R	MW12RR	MW14	MW15	MW16
TOP OF CASING	655.57	675.66	611.17	612.49	679.57	645.19	644.78	644.09	674.07	675.97	654.69
6/21/1989	579.56	648.78	606.07		648.84	NM			NM	NM	NM
1/30/1991	Dry	646.66	606.17		643.57	NM			NM	NM	NM
4/20/1991	Dry	646.98	607.69		646.72	567.67			623.06	647.12	625.89
12/19/1991	Dry	646.16	605.67		646.07	565.31			624.28	NM	NM
9/28/1992	Dry	646.87	603.22		648.76	567.12			Dry	649.13	625.62
12/29/1992	Dry	649.29	607.32		650.20	567.57			Dry	649.53	626.15
3/25/1993	Dry	650.55	608.32		651.62	567.48			Dry	650.90	627.98
6/30/1993	Dry	651.86	607.75		653.09	567.81			Dry	652.18	629.27
4/4/1994	Dry	654.48	NM		655.02	568.06			618.73	654.74	630.34
9/28/1994	Dry	654.18	604.30		654.34	568.05			616.83	654.43	628.19
5/30/1995	Dry	654.56	NM		655.90	568.04			621.69	654.57	630.81
6/28/1995	Dry	654.76	606.37		656.27	568.39			617.70	654.82	631.04
7/25/1995	Dry	654.86	605.57		656.11	568.39			618.30	655.17	630.34
8/24/1995	Dry	654.84	605.92		655.72	568.23			619.00	655.15	629.53
9/27/1995	Dry	654.92	605.71		655.52	568.25			619.00	655.18	628.97
10/25/1995	Dry	654.86	605.22		655.27	568.39			618.85	654.95	628.69
11/29/1995	Dry	654.66	606.12		655.47	568.29			621.20	654.77	628.49
4/8/1996	Dry	654.34	606.87		654.47	568.41			638.12	654.48	629.12
4/17/1996	Dry	654.54	607.66		654.87	568.52			639.43	654.83	629.41
5/16/1996	Dry	654.46	607.30		655.23	568.61			626.57	654.57	630.59
6/4/1996	Dry	654.86	606.77		655.47	568.79			628.52	655.14	630.94
7/24/1996	Dry	655.06	NM		656.07	568.59			635.27	655.37	629.99
8/30/1996	Dry	654.86	NM		656.17	568.34			635.77	655.07	NM
9/19/1996	580.62	654.78	604.36		655.57	568.45			636.08	655.00	629.01
10/25/1996	Dry	654.56	NM		NM	568.84			626.29	654.87	628.57
3/11/1997	583.80	652.98	607.37		653.91	568.40			639.07	653.22	628.15
3/26/1998	598.57	655.04	607.55		657.39	569.08			640.51	655.36	632.37
5/4/1998	NM	655.66	NM		658.35	569.09			627.27	655.97	630.09
6/23/1998	NM	NM	NM		NM	568.79			637.77	NM	NM
7/24/1998	NM	656.08	NM		658.76	568.77			640.29	656.39	NM
8/26/1998	NM	656.14	NM		658.09	568.89			640.86	656.45	NM
9/22/1998	NM	655.91	NM		657.45	568.84			642.67	656.22	NM
10/11/1998	616.26	656.03	606.83		657.18	568.89			644.59	655.25	631.80
3/2/2000	617.83	654.39	607.25		654.89	569.14			643.75	654.59	629.44
5/31/2000	655.57	653.46	NM		654.14	569.49			641.89	653.77	NM
6/28/2000	NM	653.21	NM		654.16	569.29			642.87	653.52	NM
7/26/2000	NM	653.51	NM		655.02	569.39			642.07	652.82	NM
8/31/2000	NM	653.66	NM		654.97	569.59			641.57	653.97	NM
9/19/2000	619.63	653.71	604.76		654.97	569.89			641.69	653.90	628.48
10/24/2000	NM	653.16	NM		654.17	569.19			641.17	653.47	626.89
3/28/2001	619.68	652.97	605.95		654.97	569.63			641.20	653.23	629.87
9/5/2001	621.09	654.80	607.25		656.47	569.49			643.76	655.00	630.05
3/29/2002	621.12	656.36	604.07		658.57	569.99			643.97	656.72	630.99
10/1/2002	624.21	656.80	604.72		658.26	569.97			645.96	656.86	629.75
3/26/2003	623.42	653.90	605.12		654.89	570.02			645.17	654.04	628.84
9/30/2003	624.66	653.56	605.12		654.85	568.54			644.05	653.69	630.34
3/18/2004	626.92	656.16	607.07		658.27	570.04			647.35	656.07	631.59
9/9/2004	627.67	657.26	605.47		658.57	569.97			647.15	656.97	630.79
3/30/2005	629.67	658.36	607.57		660.19	570.84			648.47	658.57	633.49
9/16/2005	628.67	657.16	604.55		654.42	570.06			647.57	657.34	631.27
3/29/2006	629.97	654.86	608.52		655.99	569.99			648.97	656.17	633.49
9/13/2006	629.00	654.31	604.51		655.48	570.37			645.57	654.54	634.33
3/8/2007	629.02	652.66	607.22		653.77	570.19			644.47	652.87	632.04
9/13/2007	624.87	653.21	605.22		654.84	570.49			644.54	652.12	633.08
3/11/2008	621.34	652.19	NM		646.05	569.98			638.86	651.49	630.31
9/22/2008	621.41	652.33	604.78		646.18	570.13			638.97	651.65	630.52
3/17/2009	631.62	656.76	607.82		655.62	573.04			646.97	656.97	635.79
9/16/2009	631.85	658.96	605.67		660.62	573.09			647.57	659.20	636.02
3/17/2010	633.12	660.81	607.82		662.97	571.98			659.87	661.05	638.25
9/22/2010	633.92	662.09	607.99		663.05	585.93			651.19	661.94	638.16
3/16/2011	633.42	659.44	607.52		660.62	594.62			656.60	659.69	637.84
9/14/2011	632.39	660.22	604.09		660.87	592.04			648.99	660.44	636.95
3/28/2012	633.91	658.52	607.25		659.50	(4)			650.55	658.52	637.35
9/12/2012	631.51	657.77	604.10		656.92	(5)	571.86		647.77	657.97	636.14
3/22/2013	632.91	655.11	607.27		655.32	(5)	571.78		652.64	655.12	637.34
9/5/2013	631.60	653.02	603.97		653.84	(5)	571.50		646.13	655.45	636.10
3/25/2014	633.41	625.85	(6)		653.32	(5)	584.58		650.57	652.37	634.49
9/24/2014	632.45	668.52	606.42		647.54	(5)	571.36		641.17	648.23	637.59
4/16/2015	633.79	634.21	651.67		629.95	(5)	582.41		629.19	634.15	638.41
9/9/2015	629.47	655.46	605.17		653.27	(5)	571.68		643.67	655.47	636.29
10/4/2016	632.67	655.96	603.87	602.94	655.84	(5)	576.66	571.54	645.82	656.17	638.57

**HISTORIC WATER LEVEL MEASUREMENTS
CITY OF KEOKUK LANDFILL (CLOSED)**

DATE	MW6	MW7	MW8	MW8R	MW9	MW12	MW12R	MW12RR	MW14	MW15	MW16
TOP OF CASING	655.57	675.66	611.17	612.49	679.57	645.19	644.78	644.09	674.07	675.97	654.69
3/23/2017	633.61	653.76	(7)	603.72	647.75	(5)	(7)	571.95	642.07	655.01	636.99
9/15/2017	631.71	654.68	(7)	602.56	654.79	(5)	(7)	571.65	645.07	654.57	636.61
3/13/2018	633.59	655.96	(7)	604.16	653.17	(5)	(7)	571.44	646.59	653.79	636.69
8/28/2018	632.42	655.01	(7)	602.58	652.42	(5)	(7)	569.91	646.00	653.97	635.08
3/13/2019	636.64	658.07	(7)	607.48	655.39	(5)	(7)	579.91	669.87	655.99	638.29
9/17/2019	634.06	656.70	(7)	603.44	656.55	(5)	(7)	571.62	646.80	656.82	638.47
3/5/2020	636.47	658.36	(7)	604.56	658.68	(5)	(7)	571.79	657.57	658.44	640.39
9/28/2020	634.40	657.97	(7)	603.57	658.26	(5)	(7)	571.90	648.25	658.08	638.70
3/16/2021	636.28	657.98	(7)	605.08	657.87	(5)	(7)	571.96	670.87	658.01	640.30
9/28/2021	(8)	658.72	(7)	603.54	659.12	(5)	(7)	571.97	648.41	658.83	638.80
3/22/2022	634.91	656.91	(7)	605.44	657.17	(5)	(7)	572.38	671.43	656.98	639.49
9/1/2022	633.24	657.56	(7)	602.83	658.04	(5)	(7)	571.82	648.22	657.68	637.78
3/2/2023	634.51	635.66	(7)	636.25	673.80	(5)	(7)	569.18	688.97	654.29	639.65
8/31/2023	635.78	613.76	(7)	669.67	689.56	(5)	(7)	566.54	729.72	650.90	641.52
4/1/2024	634.58	655.25	(7)	636.46	654.99	(5)	(7)	540.27	670.03	655.32	638.94

NOTES:

- 1.) Data for 1994 through 2001 as reported in the 2001 AWQR prepared by MWH.
- 2.) Data for 2002 through March 18, 2009 as reported in 2008 AWQR and 2009 Semi-Annual Water Quality Report, Barker Lemar.
- 3.) Data for September 2009 through present collected by PDC Laboratories sampling crew.
- 4.) MW12 did not pass 2011 slug test and is scheduled for replacement in 2012
- 5.) MW12 abandoned and replace by MW12R
- 6.) MW8 lock frozen under water; could not open well to sample

LABORATORY RESULTS

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Jessica A Coca, P.E.
Klingner & Associates PC
610 N 4th St
Suite #100
Burlington, Iowa 52601

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JOB DESCRIPTION

Keokuk Landfill 21-2010

JOB NUMBER

310-277915-1

Eurofins Cedar Falls

Job Notes

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Authorization



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Case Narrative

Client: Klingner & Associates PC
Project: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Job ID: 310-277915-1

Eurofins Cedar Falls

**Job Narrative
310-277915-1**

REVISION

The report being provided is a revision of the original report sent on 4/9/2024. The report (revision 1) is being revised due to This report was revised 10/21/2024. Additional VOCs added to the job..

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 4/2/2024 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.9°C.

GC/MS VOA

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: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-277915-1	MW-7	Water	04/01/24 11:00	04/02/24 10:00
310-277915-2	MW-9	Water	04/01/24 10:30	04/02/24 10:00
310-277915-3	MW-12RR	Water	04/01/24 09:30	04/02/24 10:00
310-277915-4	MW-15	Water	04/01/24 10:50	04/02/24 10:00

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Detection Summary

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-7

Lab Sample ID: 310-277915-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethane	6.70		1.00		ug/L	1		8260D	Total/NA
1,2-Dichloropropane	1.77		1.00		ug/L	1		8260D	Total/NA
Benzene	0.649		0.500		ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	45.6		1.00		ug/L	1		8260D	Total/NA
Trichloroethene	10.3		1.00		ug/L	1		8260D	Total/NA
Vinyl chloride	1.66		1.00		ug/L	1		8260D	Total/NA
Arsenic	0.00271		0.00200		mg/L	1		6020B	Total/NA
Barium	0.479		0.00200		mg/L	1		6020B	Total/NA
Cadmium	0.000334		0.000200		mg/L	1		6020B	Total/NA
Cobalt	0.00528		0.000500		mg/L	1		6020B	Total/NA
Lead	0.00228		0.000500		mg/L	1		6020B	Total/NA
Nickel	0.00757		0.00500		mg/L	1		6020B	Total/NA
Total Suspended Solids	599		15.0		mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-9

Lab Sample ID: 310-277915-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.443		0.00200		mg/L	1		6020B	Total/NA
Cadmium	0.000344		0.000200		mg/L	1		6020B	Total/NA
Cobalt	0.00649		0.000500		mg/L	1		6020B	Total/NA
Lead	0.00153		0.000500		mg/L	1		6020B	Total/NA
Nickel	0.0109		0.00500		mg/L	1		6020B	Total/NA
Selenium	0.0236		0.00500		mg/L	1		6020B	Total/NA
Total Suspended Solids	177		15.0		mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-12RR

Lab Sample ID: 310-277915-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0165		0.00200		mg/L	1		6020B	Total/NA
Cobalt	0.000649		0.000500		mg/L	1		6020B	Total/NA
Lead	0.00156		0.000500		mg/L	1		6020B	Total/NA
Vanadium	0.00597		0.00500		mg/L	1		6020B	Total/NA
Total Suspended Solids	196		30.0		mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-15

Lab Sample ID: 310-277915-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	9.73		1.00		ug/L	1		8260D	Total/NA
Arsenic	0.00546		0.00200		mg/L	1		6020B	Total/NA
Barium	0.223		0.00200		mg/L	1		6020B	Total/NA
Cobalt	0.00356		0.000500		mg/L	1		6020B	Total/NA
Lead	0.000546		0.000500		mg/L	1		6020B	Total/NA
Nickel	0.00718		0.00500		mg/L	1		6020B	Total/NA
Total Suspended Solids	24.0		10.0		mg/L	1		I-3765-85	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-7

Lab Sample ID: 310-277915-1

Date Collected: 04/01/24 11:00

Matrix: Water

Date Received: 04/02/24 10:00

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		ug/L			04/02/24 21:46	1
1,1,1-Trichloroethane	<1.00		1.00		ug/L			04/02/24 21:46	1
1,1,2,2-Tetrachloroethane	<1.00		1.00		ug/L			04/02/24 21:46	1
1,1,2-Trichloroethane	<1.00		1.00		ug/L			04/02/24 21:46	1
1,1-Dichloroethane	6.70		1.00		ug/L			04/02/24 21:46	1
1,1-Dichloroethene	<2.00		2.00		ug/L			04/02/24 21:46	1
1,2,3-Trichloropropane	<1.00		1.00		ug/L			04/02/24 21:46	1
1,2-Dibromo-3-chloropropane	<5.00		5.00		ug/L			04/02/24 21:46	1
1,2-Dibromoethane (EDB)	<1.00		1.00		ug/L			04/02/24 21:46	1
1,2-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 21:46	1
1,2-Dichloroethane	<1.00		1.00		ug/L			04/02/24 21:46	1
1,2-Dichloropropane	1.77		1.00		ug/L			04/02/24 21:46	1
1,4-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 21:46	1
2-Butanone (MEK)	<10.0		10.0		ug/L			04/02/24 21:46	1
2-Hexanone	<10.0		10.0		ug/L			04/02/24 21:46	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0		ug/L			04/02/24 21:46	1
Acetone	<10.0		10.0		ug/L			04/02/24 21:46	1
Acrylonitrile	<5.00		5.00		ug/L			04/02/24 21:46	1
Benzene	0.649		0.500		ug/L			04/02/24 21:46	1
Bromochloromethane	<5.00		5.00		ug/L			04/02/24 21:46	1
Bromodichloromethane	<1.00		1.00		ug/L			04/02/24 21:46	1
Bromoform	<5.00		5.00		ug/L			04/02/24 21:46	1
Bromomethane	<4.00		4.00		ug/L			04/02/24 21:46	1
Carbon disulfide	<1.00		1.00		ug/L			04/02/24 21:46	1
Carbon tetrachloride	<2.00		2.00		ug/L			04/02/24 21:46	1
Chlorobenzene	<1.00		1.00		ug/L			04/02/24 21:46	1
Chloroethane	<4.00		4.00		ug/L			04/02/24 21:46	1
Chloroform	<3.00		3.00		ug/L			04/02/24 21:46	1
Chloromethane	<3.00		3.00		ug/L			04/02/24 21:46	1
cis-1,2-Dichloroethene	45.6		1.00		ug/L			04/02/24 21:46	1
cis-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 21:46	1
Dibromochloromethane	<5.00		5.00		ug/L			04/02/24 21:46	1
Dibromomethane	<1.00		1.00		ug/L			04/02/24 21:46	1
Ethylbenzene	<1.00		1.00		ug/L			04/02/24 21:46	1
Iodomethane	<10.0		10.0		ug/L			04/02/24 21:46	1
m,p-Xylene	<2.00		2.00		ug/L			04/02/24 21:46	1
Methylene chloride	<5.00		5.00		ug/L			04/02/24 21:46	1
o-Xylene	<1.00		1.00		ug/L			04/02/24 21:46	1
Styrene	<1.00		1.00		ug/L			04/02/24 21:46	1
Tetrachloroethene	<1.00		1.00		ug/L			04/02/24 21:46	1
Toluene	<1.00		1.00		ug/L			04/02/24 21:46	1
trans-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 21:46	1
trans-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 21:46	1
trans-1,4-Dichloro-2-butene	<10.0		10.0		ug/L			04/02/24 21:46	1
Trichloroethene	10.3		1.00		ug/L			04/02/24 21:46	1
Trichlorofluoromethane	<4.00		4.00		ug/L			04/02/24 21:46	1
Vinyl acetate	<10.0		10.0		ug/L			04/02/24 21:46	1
Vinyl chloride	1.66		1.00		ug/L			04/02/24 21:46	1
Xylenes, Total	<3.00		3.00		ug/L			04/02/24 21:46	1

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Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-7
Date Collected: 04/01/24 11:00
Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-1
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		80 - 120		04/02/24 21:46	1
Dibromofluoromethane (Surr)	108		73 - 130		04/02/24 21:46	1
Toluene-d8 (Surr)	97		80 - 120		04/02/24 21:46	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/03/24 09:30	04/05/24 17:10	1
Arsenic	0.00271		0.00200		mg/L		04/03/24 09:30	04/04/24 16:13	1
Barium	0.479		0.00200		mg/L		04/03/24 09:30	04/04/24 16:13	1
Beryllium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:13	1
Cadmium	0.000334		0.000200		mg/L		04/03/24 09:30	04/04/24 16:13	1
Chromium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Cobalt	0.00528		0.000500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Copper	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Lead	0.00228		0.000500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Nickel	0.00757		0.00500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Selenium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Silver	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:13	1
Thallium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:13	1
Vanadium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:13	1
Zinc	<0.0200		0.0200		mg/L		04/03/24 09:30	04/04/24 16:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	599		15.0		mg/L			04/05/24 13:58	1

Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-9

Lab Sample ID: 310-277915-2

Date Collected: 04/01/24 10:30

Matrix: Water

Date Received: 04/02/24 10:00

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		ug/L			04/02/24 22:09	1
1,1,1-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,1,2,2-Tetrachloroethane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,1,2-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,1-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,1-Dichloroethene	<2.00		2.00		ug/L			04/02/24 22:09	1
1,2,3-Trichloropropane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,2-Dibromo-3-chloropropane	<5.00		5.00		ug/L			04/02/24 22:09	1
1,2-Dibromoethane (EDB)	<1.00		1.00		ug/L			04/02/24 22:09	1
1,2-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:09	1
1,2-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,2-Dichloropropane	<1.00		1.00		ug/L			04/02/24 22:09	1
1,4-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:09	1
2-Butanone (MEK)	<10.0		10.0		ug/L			04/02/24 22:09	1
2-Hexanone	<10.0		10.0		ug/L			04/02/24 22:09	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0		ug/L			04/02/24 22:09	1
Acetone	<10.0		10.0		ug/L			04/02/24 22:09	1
Acrylonitrile	<5.00		5.00		ug/L			04/02/24 22:09	1
Benzene	<0.500		0.500		ug/L			04/02/24 22:09	1
Bromochloromethane	<5.00		5.00		ug/L			04/02/24 22:09	1
Bromodichloromethane	<1.00		1.00		ug/L			04/02/24 22:09	1
Bromoform	<5.00		5.00		ug/L			04/02/24 22:09	1
Bromomethane	<4.00		4.00		ug/L			04/02/24 22:09	1
Carbon disulfide	<1.00		1.00		ug/L			04/02/24 22:09	1
Carbon tetrachloride	<2.00		2.00		ug/L			04/02/24 22:09	1
Chlorobenzene	<1.00		1.00		ug/L			04/02/24 22:09	1
Chloroethane	<4.00		4.00		ug/L			04/02/24 22:09	1
Chloroform	<3.00		3.00		ug/L			04/02/24 22:09	1
Chloromethane	<3.00		3.00		ug/L			04/02/24 22:09	1
cis-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 22:09	1
cis-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:09	1
Dibromochloromethane	<5.00		5.00		ug/L			04/02/24 22:09	1
Dibromomethane	<1.00		1.00		ug/L			04/02/24 22:09	1
Ethylbenzene	<1.00		1.00		ug/L			04/02/24 22:09	1
Iodomethane	<10.0		10.0		ug/L			04/02/24 22:09	1
m,p-Xylene	<2.00		2.00		ug/L			04/02/24 22:09	1
Methylene chloride	<5.00		5.00		ug/L			04/02/24 22:09	1
o-Xylene	<1.00		1.00		ug/L			04/02/24 22:09	1
Styrene	<1.00		1.00		ug/L			04/02/24 22:09	1
Tetrachloroethene	<1.00		1.00		ug/L			04/02/24 22:09	1
Toluene	<1.00		1.00		ug/L			04/02/24 22:09	1
trans-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 22:09	1
trans-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:09	1
trans-1,4-Dichloro-2-butene	<10.0		10.0		ug/L			04/02/24 22:09	1
Trichloroethene	<1.00		1.00		ug/L			04/02/24 22:09	1
Trichlorofluoromethane	<4.00		4.00		ug/L			04/02/24 22:09	1
Vinyl acetate	<10.0		10.0		ug/L			04/02/24 22:09	1
Vinyl chloride	<1.00		1.00		ug/L			04/02/24 22:09	1
Xylenes, Total	<3.00		3.00		ug/L			04/02/24 22:09	1

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Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-9

Lab Sample ID: 310-277915-2

Date Collected: 04/01/24 10:30

Matrix: Water

Date Received: 04/02/24 10:00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		80 - 120		04/02/24 22:09	1
Dibromofluoromethane (Surr)	112		73 - 130		04/02/24 22:09	1
Toluene-d8 (Surr)	97		80 - 120		04/02/24 22:09	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/03/24 09:30	04/05/24 17:13	1
Arsenic	<0.00200		0.00200		mg/L		04/03/24 09:30	04/04/24 16:16	1
Barium	0.443		0.00200		mg/L		04/03/24 09:30	04/04/24 16:16	1
Beryllium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:16	1
Cadmium	0.000344		0.000200		mg/L		04/03/24 09:30	04/04/24 16:16	1
Chromium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Cobalt	0.00649		0.000500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Copper	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Lead	0.00153		0.000500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Nickel	0.0109		0.00500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Selenium	0.0236		0.00500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Silver	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:16	1
Thallium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:16	1
Vanadium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:16	1
Zinc	<0.0200		0.0200		mg/L		04/03/24 09:30	04/04/24 16:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	177		15.0		mg/L			04/05/24 13:58	1

Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-12RR

Lab Sample ID: 310-277915-3

Date Collected: 04/01/24 09:30

Matrix: Water

Date Received: 04/02/24 10:00

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		ug/L			04/02/24 22:32	1
1,1,1-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,1,2,2-Tetrachloroethane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,1,2-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,1-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,1-Dichloroethene	<2.00		2.00		ug/L			04/02/24 22:32	1
1,2,3-Trichloropropane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,2-Dibromo-3-chloropropane	<5.00		5.00		ug/L			04/02/24 22:32	1
1,2-Dibromoethane (EDB)	<1.00		1.00		ug/L			04/02/24 22:32	1
1,2-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:32	1
1,2-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,2-Dichloropropane	<1.00		1.00		ug/L			04/02/24 22:32	1
1,4-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:32	1
2-Butanone (MEK)	<10.0		10.0		ug/L			04/02/24 22:32	1
2-Hexanone	<10.0		10.0		ug/L			04/02/24 22:32	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0		ug/L			04/02/24 22:32	1
Acetone	<10.0		10.0		ug/L			04/02/24 22:32	1
Acrylonitrile	<5.00		5.00		ug/L			04/02/24 22:32	1
Benzene	<0.500		0.500		ug/L			04/02/24 22:32	1
Bromochloromethane	<5.00		5.00		ug/L			04/02/24 22:32	1
Bromodichloromethane	<1.00		1.00		ug/L			04/02/24 22:32	1
Bromoform	<5.00		5.00		ug/L			04/02/24 22:32	1
Bromomethane	<4.00		4.00		ug/L			04/02/24 22:32	1
Carbon disulfide	<1.00		1.00		ug/L			04/02/24 22:32	1
Carbon tetrachloride	<2.00		2.00		ug/L			04/02/24 22:32	1
Chlorobenzene	<1.00		1.00		ug/L			04/02/24 22:32	1
Chloroethane	<4.00		4.00		ug/L			04/02/24 22:32	1
Chloroform	<3.00		3.00		ug/L			04/02/24 22:32	1
Chloromethane	<3.00		3.00		ug/L			04/02/24 22:32	1
cis-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 22:32	1
cis-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:32	1
Dibromochloromethane	<5.00		5.00		ug/L			04/02/24 22:32	1
Dibromomethane	<1.00		1.00		ug/L			04/02/24 22:32	1
Ethylbenzene	<1.00		1.00		ug/L			04/02/24 22:32	1
Iodomethane	<10.0		10.0		ug/L			04/02/24 22:32	1
m,p-Xylene	<2.00		2.00		ug/L			04/02/24 22:32	1
Methylene chloride	<5.00		5.00		ug/L			04/02/24 22:32	1
o-Xylene	<1.00		1.00		ug/L			04/02/24 22:32	1
Styrene	<1.00		1.00		ug/L			04/02/24 22:32	1
Tetrachloroethene	<1.00		1.00		ug/L			04/02/24 22:32	1
Toluene	<1.00		1.00		ug/L			04/02/24 22:32	1
trans-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 22:32	1
trans-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:32	1
trans-1,4-Dichloro-2-butene	<10.0		10.0		ug/L			04/02/24 22:32	1
Trichloroethene	<1.00		1.00		ug/L			04/02/24 22:32	1
Trichlorofluoromethane	<4.00		4.00		ug/L			04/02/24 22:32	1
Vinyl acetate	<10.0		10.0		ug/L			04/02/24 22:32	1
Vinyl chloride	<1.00		1.00		ug/L			04/02/24 22:32	1
Xylenes, Total	<3.00		3.00		ug/L			04/02/24 22:32	1

Eurofins Cedar Falls

Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-12RR

Lab Sample ID: 310-277915-3

Date Collected: 04/01/24 09:30

Matrix: Water

Date Received: 04/02/24 10:00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		04/02/24 22:32	1
Dibromofluoromethane (Surr)	112		73 - 130		04/02/24 22:32	1
Toluene-d8 (Surr)	91		80 - 120		04/02/24 22:32	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/03/24 09:30	04/05/24 17:17	1
Arsenic	<0.00200		0.00200		mg/L		04/03/24 09:30	04/04/24 16:19	1
Barium	0.0165		0.00200		mg/L		04/03/24 09:30	04/04/24 16:19	1
Beryllium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:19	1
Cadmium	<0.000200		0.000200		mg/L		04/03/24 09:30	04/04/24 16:19	1
Chromium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Cobalt	0.000649		0.000500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Copper	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Lead	0.00156		0.000500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Nickel	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Selenium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Silver	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:19	1
Thallium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:19	1
Vanadium	0.00597		0.00500		mg/L		04/03/24 09:30	04/04/24 16:19	1
Zinc	<0.0200		0.0200		mg/L		04/03/24 09:30	04/04/24 16:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	196		30.0		mg/L			04/05/24 13:58	1

Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-15

Lab Sample ID: 310-277915-4

Date Collected: 04/01/24 10:50

Matrix: Water

Date Received: 04/02/24 10:00

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		ug/L			04/02/24 22:55	1
1,1,1-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,1,2,2-Tetrachloroethane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,1,2-Trichloroethane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,1-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,1-Dichloroethene	<2.00		2.00		ug/L			04/02/24 22:55	1
1,2,3-Trichloropropane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,2-Dibromo-3-chloropropane	<5.00		5.00		ug/L			04/02/24 22:55	1
1,2-Dibromoethane (EDB)	<1.00		1.00		ug/L			04/02/24 22:55	1
1,2-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:55	1
1,2-Dichloroethane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,2-Dichloropropane	<1.00		1.00		ug/L			04/02/24 22:55	1
1,4-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 22:55	1
2-Butanone (MEK)	<10.0		10.0		ug/L			04/02/24 22:55	1
2-Hexanone	<10.0		10.0		ug/L			04/02/24 22:55	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0		ug/L			04/02/24 22:55	1
Acetone	<10.0		10.0		ug/L			04/02/24 22:55	1
Acrylonitrile	<5.00		5.00		ug/L			04/02/24 22:55	1
Benzene	<0.500		0.500		ug/L			04/02/24 22:55	1
Bromochloromethane	<5.00		5.00		ug/L			04/02/24 22:55	1
Bromodichloromethane	<1.00		1.00		ug/L			04/02/24 22:55	1
Bromoform	<5.00		5.00		ug/L			04/02/24 22:55	1
Bromomethane	<4.00		4.00		ug/L			04/02/24 22:55	1
Carbon disulfide	<1.00		1.00		ug/L			04/02/24 22:55	1
Carbon tetrachloride	<2.00		2.00		ug/L			04/02/24 22:55	1
Chlorobenzene	<1.00		1.00		ug/L			04/02/24 22:55	1
Chloroethane	<4.00		4.00		ug/L			04/02/24 22:55	1
Chloroform	<3.00		3.00		ug/L			04/02/24 22:55	1
Chloromethane	<3.00		3.00		ug/L			04/02/24 22:55	1
cis-1,2-Dichloroethene	9.73		1.00		ug/L			04/02/24 22:55	1
cis-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:55	1
Dibromochloromethane	<5.00		5.00		ug/L			04/02/24 22:55	1
Dibromomethane	<1.00		1.00		ug/L			04/02/24 22:55	1
Ethylbenzene	<1.00		1.00		ug/L			04/02/24 22:55	1
Iodomethane	<10.0		10.0		ug/L			04/02/24 22:55	1
m,p-Xylene	<2.00		2.00		ug/L			04/02/24 22:55	1
Methylene chloride	<5.00		5.00		ug/L			04/02/24 22:55	1
o-Xylene	<1.00		1.00		ug/L			04/02/24 22:55	1
Styrene	<1.00		1.00		ug/L			04/02/24 22:55	1
Tetrachloroethene	<1.00		1.00		ug/L			04/02/24 22:55	1
Toluene	<1.00		1.00		ug/L			04/02/24 22:55	1
trans-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 22:55	1
trans-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 22:55	1
trans-1,4-Dichloro-2-butene	<10.0		10.0		ug/L			04/02/24 22:55	1
Trichloroethene	<1.00		1.00		ug/L			04/02/24 22:55	1
Trichlorofluoromethane	<4.00		4.00		ug/L			04/02/24 22:55	1
Vinyl acetate	<10.0		10.0		ug/L			04/02/24 22:55	1
Vinyl chloride	<1.00		1.00		ug/L			04/02/24 22:55	1
Xylenes, Total	<3.00		3.00		ug/L			04/02/24 22:55	1

Eurofins Cedar Falls

Client Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-15
Date Collected: 04/01/24 10:50
Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-4
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		80 - 120		04/02/24 22:55	1
Dibromofluoromethane (Surr)	112		73 - 130		04/02/24 22:55	1
Toluene-d8 (Surr)	99		80 - 120		04/02/24 22:55	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/03/24 09:30	04/05/24 17:20	1
Arsenic	0.00546		0.00200		mg/L		04/03/24 09:30	04/04/24 16:23	1
Barium	0.223		0.00200		mg/L		04/03/24 09:30	04/04/24 16:23	1
Beryllium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:23	1
Cadmium	<0.000200		0.000200		mg/L		04/03/24 09:30	04/04/24 16:23	1
Chromium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Cobalt	0.00356		0.000500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Copper	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Lead	0.000546		0.000500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Nickel	0.00718		0.00500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Selenium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Silver	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:23	1
Thallium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 16:23	1
Vanadium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 16:23	1
Zinc	<0.0200		0.0200		mg/L		04/03/24 09:30	04/04/24 16:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	24.0		10.0		mg/L			04/05/24 13:58	1

Definitions/Glossary

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Surrogate Summary

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	TOL
		(80-120)	(73-130)	(80-120)
310-277915-1	MW-7	100	108	97
310-277915-2	MW-9	102	112	97
310-277915-3	MW-12RR	99	112	91
310-277915-4	MW-15	103	112	99
LCS 310-417633/6	Lab Control Sample	104	98	101
LCS 310-417633/7	Lab Control Sample	104	109	99
MB 310-417633/5	Method Blank	102	108	98

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

TOL = Toluene-d8 (Surr)

QC Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Lab Sample ID: MB 310-417633/5
Matrix: Water
Analysis Batch: 417633

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		ug/L			04/02/24 17:12	1
1,1,1-Trichloroethane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,1,2,2-Tetrachloroethane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,1,2-Trichloroethane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,1-Dichloroethane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,1-Dichloroethene	<2.00		2.00		ug/L			04/02/24 17:12	1
1,2,3-Trichloropropane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,2-Dibromo-3-chloropropane	<5.00		5.00		ug/L			04/02/24 17:12	1
1,2-Dibromoethane (EDB)	<1.00		1.00		ug/L			04/02/24 17:12	1
1,2-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 17:12	1
1,2-Dichloroethane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,2-Dichloropropane	<1.00		1.00		ug/L			04/02/24 17:12	1
1,4-Dichlorobenzene	<1.00		1.00		ug/L			04/02/24 17:12	1
2-Butanone (MEK)	<10.0		10.0		ug/L			04/02/24 17:12	1
2-Hexanone	<10.0		10.0		ug/L			04/02/24 17:12	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0		ug/L			04/02/24 17:12	1
Acetone	<10.0		10.0		ug/L			04/02/24 17:12	1
Acrylonitrile	<5.00		5.00		ug/L			04/02/24 17:12	1
Benzene	<0.500		0.500		ug/L			04/02/24 17:12	1
Bromochloromethane	<5.00		5.00		ug/L			04/02/24 17:12	1
Bromodichloromethane	<1.00		1.00		ug/L			04/02/24 17:12	1
Bromoform	<5.00		5.00		ug/L			04/02/24 17:12	1
Bromomethane	<4.00		4.00		ug/L			04/02/24 17:12	1
Carbon disulfide	<1.00		1.00		ug/L			04/02/24 17:12	1
Carbon tetrachloride	<2.00		2.00		ug/L			04/02/24 17:12	1
Chlorobenzene	<1.00		1.00		ug/L			04/02/24 17:12	1
Chloroethane	<4.00		4.00		ug/L			04/02/24 17:12	1
Chloroform	<3.00		3.00		ug/L			04/02/24 17:12	1
Chloromethane	<3.00		3.00		ug/L			04/02/24 17:12	1
cis-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 17:12	1
cis-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 17:12	1
Dibromochloromethane	<5.00		5.00		ug/L			04/02/24 17:12	1
Dibromomethane	<1.00		1.00		ug/L			04/02/24 17:12	1
Ethylbenzene	<1.00		1.00		ug/L			04/02/24 17:12	1
Iodomethane	<10.0		10.0		ug/L			04/02/24 17:12	1
m,p-Xylene	<2.00		2.00		ug/L			04/02/24 17:12	1
Methylene chloride	<5.00		5.00		ug/L			04/02/24 17:12	1
o-Xylene	<1.00		1.00		ug/L			04/02/24 17:12	1
Styrene	<1.00		1.00		ug/L			04/02/24 17:12	1
Tetrachloroethene	<1.00		1.00		ug/L			04/02/24 17:12	1
Toluene	<1.00		1.00		ug/L			04/02/24 17:12	1
trans-1,2-Dichloroethene	<1.00		1.00		ug/L			04/02/24 17:12	1
trans-1,3-Dichloropropene	<5.00		5.00		ug/L			04/02/24 17:12	1
trans-1,4-Dichloro-2-butene	<10.0		10.0		ug/L			04/02/24 17:12	1
Trichloroethene	<1.00		1.00		ug/L			04/02/24 17:12	1
Trichlorofluoromethane	<4.00		4.00		ug/L			04/02/24 17:12	1
Vinyl acetate	<10.0		10.0		ug/L			04/02/24 17:12	1
Vinyl chloride	<1.00		1.00		ug/L			04/02/24 17:12	1

Eurofins Cedar Falls

QC Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Lab Sample ID: MB 310-417633/5
Matrix: Water
Analysis Batch: 417633

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	<3.00		3.00		ug/L			04/02/24 17:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	102		80 - 120		04/02/24 17:12	1
Dibromofluoromethane (Surr)	108		73 - 130		04/02/24 17:12	1
Toluene-d8 (Surr)	98		80 - 120		04/02/24 17:12	1

Lab Sample ID: LCS 310-417633/6
Matrix: Water
Analysis Batch: 417633

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	19.29		ug/L		96	71 - 120
1,1,1-Trichloroethane	20.0	19.25		ug/L		96	73 - 129
1,1,2,2-Tetrachloroethane	20.0	18.32		ug/L		92	68 - 124
1,1,2-Trichloroethane	20.0	19.94		ug/L		100	73 - 123
1,1-Dichloroethane	20.0	17.66		ug/L		88	70 - 127
1,1-Dichloroethene	20.0	17.94		ug/L		90	63 - 132
1,2,3-Trichloropropane	20.0	18.27		ug/L		91	65 - 127
1,2-Dibromo-3-chloropropane	20.0	24.14		ug/L		121	50 - 150
1,2-Dibromoethane (EDB)	20.0	19.87		ug/L		99	75 - 125
1,2-Dichlorobenzene	20.0	18.73		ug/L		94	74 - 120
1,2-Dichloroethane	20.0	18.72		ug/L		94	71 - 125
1,2-Dichloropropane	20.0	19.88		ug/L		99	73 - 124
1,4-Dichlorobenzene	20.0	18.18		ug/L		91	72 - 120
2-Butanone (MEK)	40.0	40.43		ug/L		101	50 - 150
2-Hexanone	40.0	40.86		ug/L		102	60 - 140
4-Methyl-2-pentanone (MIBK)	40.0	39.22		ug/L		98	60 - 139
Acetone	40.0	37.94		ug/L		95	50 - 150
Acrylonitrile	200	195.2		ug/L		98	50 - 150
Benzene	20.0	18.96		ug/L		95	72 - 124
Bromochloromethane	20.0	18.47		ug/L		92	73 - 130
Bromodichloromethane	20.0	19.17		ug/L		96	74 - 122
Bromoform	20.0	20.14		ug/L		101	61 - 122
Carbon disulfide	20.0	17.82		ug/L		89	59 - 135
Carbon tetrachloride	20.0	19.92		ug/L		100	67 - 132
Chlorobenzene	20.0	18.45		ug/L		92	76 - 120
Chloroform	20.0	17.57		ug/L		88	72 - 125
cis-1,2-Dichloroethene	20.0	18.08		ug/L		90	74 - 123
cis-1,3-Dichloropropene	20.0	19.46		ug/L		97	71 - 125
Dibromochloromethane	20.0	19.32		ug/L		97	71 - 121
Dibromomethane	20.0	19.34		ug/L		97	74 - 125
Ethylbenzene	20.0	18.68		ug/L		93	74 - 122
Iodomethane	20.0	19.16		ug/L		96	10 - 150
m,p-Xylene	20.0	18.30		ug/L		91	73 - 124
Methylene chloride	20.0	18.56		ug/L		93	50 - 150
o-Xylene	20.0	18.56		ug/L		93	73 - 122
Styrene	20.0	18.18		ug/L		91	74 - 121

Eurofins Cedar Falls

QC Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Lab Sample ID: LCS 310-417633/6
Matrix: Water
Analysis Batch: 417633

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Tetrachloroethene	20.0	19.93		ug/L		100	71 - 130
Toluene	20.0	19.22		ug/L		96	74 - 123
trans-1,2-Dichloroethene	20.0	18.79		ug/L		94	70 - 126
trans-1,3-Dichloropropene	20.0	19.65		ug/L		98	69 - 123
trans-1,4-Dichloro-2-butene	20.0	18.24		ug/L		91	50 - 150
Trichloroethene	20.0	19.98		ug/L		100	72 - 126
Vinyl acetate	40.0	39.75		ug/L		99	50 - 150
Xylenes, Total	40.0	36.86		ug/L		92	73 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	104		80 - 120
Dibromofluoromethane (Surr)	98		73 - 130
Toluene-d8 (Surr)	101		80 - 120

Lab Sample ID: LCS 310-417633/7
Matrix: Water
Analysis Batch: 417633

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	19.43		ug/L		97	23 - 150
Chloroethane	20.0	20.66		ug/L		103	54 - 136
Chloromethane	20.0	21.10		ug/L		106	38 - 150
Trichlorofluoromethane	20.0	22.84		ug/L		114	54 - 149
Vinyl chloride	20.0	21.74		ug/L		109	56 - 140

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	104		80 - 120
Dibromofluoromethane (Surr)	109		73 - 130
Toluene-d8 (Surr)	99		80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-417631/1-A
Matrix: Water
Analysis Batch: 417890

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 417631

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200		mg/L		04/03/24 09:30	04/04/24 14:24	1
Barium	<0.00200		0.00200		mg/L		04/03/24 09:30	04/04/24 14:24	1
Beryllium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 14:24	1
Cadmium	<0.000200		0.000200		mg/L		04/03/24 09:30	04/04/24 14:24	1
Chromium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Cobalt	<0.000500		0.000500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Copper	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Lead	<0.000500		0.000500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Nickel	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Selenium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Silver	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 14:24	1

Eurofins Cedar Falls

QC Sample Results

Client: Klingner & Associates PC
 Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Lab Sample ID: MB 310-417631/1-A
Matrix: Water
Analysis Batch: 417890

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 417631

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<0.00100		0.00100		mg/L		04/03/24 09:30	04/04/24 14:24	1
Vanadium	<0.00500		0.00500		mg/L		04/03/24 09:30	04/04/24 14:24	1
Zinc	<0.0200		0.0200		mg/L		04/03/24 09:30	04/04/24 14:24	1

Lab Sample ID: MB 310-417631/1-A
Matrix: Water
Analysis Batch: 418044

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 417631

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/03/24 09:30	04/05/24 16:34	1

Lab Sample ID: LCS 310-417631/2-A
Matrix: Water
Analysis Batch: 417890

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 417631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.1983		mg/L		99	80 - 120
Barium	0.100	0.09823		mg/L		98	80 - 120
Beryllium	0.100	0.1066		mg/L		107	80 - 120
Cadmium	0.100	0.09434		mg/L		94	80 - 120
Chromium	0.100	0.1029		mg/L		103	80 - 120
Cobalt	0.100	0.1006		mg/L		101	80 - 120
Copper	0.200	0.2017		mg/L		101	80 - 120
Lead	0.200	0.1936		mg/L		97	80 - 120
Nickel	0.200	0.2069		mg/L		103	80 - 120
Selenium	0.400	0.3604		mg/L		90	80 - 120
Silver	0.100	0.1042		mg/L		104	80 - 120
Thallium	0.100	0.08160		mg/L		82	80 - 120
Vanadium	0.100	0.09947		mg/L		99	80 - 120
Zinc	0.200	0.1884		mg/L		94	80 - 120

Lab Sample ID: LCS 310-417631/2-A
Matrix: Water
Analysis Batch: 418044

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 417631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2066		mg/L		103	80 - 120

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

Lab Sample ID: MB 310-418010/1
Matrix: Water
Analysis Batch: 418010

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	<5.0		5.0		mg/L			04/05/24 13:58	1

Eurofins Cedar Falls

QC Sample Results

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Lab Sample ID: LCS 310-418010/2
Matrix: Water
Analysis Batch: 418010

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	104.0		mg/L		104	75 - 116

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QC Association Summary

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

GC/MS VOA

Analysis Batch: 417633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-277915-1	MW-7	Total/NA	Water	8260D	
310-277915-2	MW-9	Total/NA	Water	8260D	
310-277915-3	MW-12RR	Total/NA	Water	8260D	
310-277915-4	MW-15	Total/NA	Water	8260D	
MB 310-417633/5	Method Blank	Total/NA	Water	8260D	
LCS 310-417633/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-417633/7	Lab Control Sample	Total/NA	Water	8260D	

Metals

Prep Batch: 417631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-277915-1	MW-7	Total/NA	Water	3005A	
310-277915-2	MW-9	Total/NA	Water	3005A	
310-277915-3	MW-12RR	Total/NA	Water	3005A	
310-277915-4	MW-15	Total/NA	Water	3005A	
MB 310-417631/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-417631/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 417890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-417631/1-A	Method Blank	Total/NA	Water	6020B	417631
LCS 310-417631/2-A	Lab Control Sample	Total/NA	Water	6020B	417631

Analysis Batch: 417969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-277915-1	MW-7	Total/NA	Water	6020B	417631
310-277915-2	MW-9	Total/NA	Water	6020B	417631
310-277915-3	MW-12RR	Total/NA	Water	6020B	417631
310-277915-4	MW-15	Total/NA	Water	6020B	417631

Analysis Batch: 418044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-417631/1-A	Method Blank	Total/NA	Water	6020B	417631
LCS 310-417631/2-A	Lab Control Sample	Total/NA	Water	6020B	417631

Analysis Batch: 418086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-277915-1	MW-7	Total/NA	Water	6020B	417631
310-277915-2	MW-9	Total/NA	Water	6020B	417631
310-277915-3	MW-12RR	Total/NA	Water	6020B	417631
310-277915-4	MW-15	Total/NA	Water	6020B	417631

General Chemistry

Analysis Batch: 418010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-277915-1	MW-7	Total/NA	Water	I-3765-85	
310-277915-2	MW-9	Total/NA	Water	I-3765-85	
310-277915-3	MW-12RR	Total/NA	Water	I-3765-85	
310-277915-4	MW-15	Total/NA	Water	I-3765-85	
MB 310-418010/1	Method Blank	Total/NA	Water	I-3765-85	

Eurofins Cedar Falls

QC Association Summary

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

General Chemistry (Continued)

Analysis Batch: 418010 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-418010/2	Lab Control Sample	Total/NA	Water	I-3765-85	

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Lab Chronicle

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

Client Sample ID: MW-7

Date Collected: 04/01/24 11:00

Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	417633	FE5V	EET CF	04/02/24 21:46
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	417969	DHM5	EET CF	04/04/24 16:13
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	418086	NFT2	EET CF	04/05/24 17:10
Total/NA	Analysis	I-3765-85		1	418010	HE7K	EET CF	04/05/24 13:58

Client Sample ID: MW-9

Date Collected: 04/01/24 10:30

Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	417633	FE5V	EET CF	04/02/24 22:09
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	417969	DHM5	EET CF	04/04/24 16:16
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	418086	NFT2	EET CF	04/05/24 17:13
Total/NA	Analysis	I-3765-85		1	418010	HE7K	EET CF	04/05/24 13:58

Client Sample ID: MW-12RR

Date Collected: 04/01/24 09:30

Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	417633	FE5V	EET CF	04/02/24 22:32
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	417969	DHM5	EET CF	04/04/24 16:19
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	418086	NFT2	EET CF	04/05/24 17:17
Total/NA	Analysis	I-3765-85		1	418010	HE7K	EET CF	04/05/24 13:58

Client Sample ID: MW-15

Date Collected: 04/01/24 10:50

Date Received: 04/02/24 10:00

Lab Sample ID: 310-277915-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	417633	FE5V	EET CF	04/02/24 22:55
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	417969	DHM5	EET CF	04/04/24 16:23
Total/NA	Prep	3005A			417631	QTZ5	EET CF	04/03/24 09:30
Total/NA	Analysis	6020B		1	418086	NFT2	EET CF	04/05/24 17:20
Total/NA	Analysis	I-3765-85		1	418010	HE7K	EET CF	04/05/24 13:58

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: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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	05-27-24

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
8260D		Water	m,p-Xylene
8260D		Water	o-Xylene

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- 14
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Method Summary

Client: Klingner & Associates PC
Project/Site: Keokuk Landfill 21-2010

Job ID: 310-277915-1

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

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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





Environment Testing
America



310-277915 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Klinger & Associates</u>			
City/State:	CITY <u>Burlington</u>	STATE <u>IA</u>	Project:
Receipt Information			
Date/Time Received:	DATE <u>4/2/24</u>	TIME <u>1000</u>	Received By: <u>JS</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: _____			
Condition of Cooler/Containers			
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 checked="" 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? ↓	
Temperature Record			
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>X</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>19</u>		Corrected Temp (°C): <u>19</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
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			
Additional Comments			



Chain of Custody Record



Client Information Client Contact: Jessica Coca (Cary), P.E. Company: Klingner & Associates PC Address: 610 N 4th St Suite #100 City: Burlington State: IA, Zip: 52601 Phone: 319-752-3603 (Tel) Email: jcoca@klingner.com Project Name: Keokuk Landfill Site:		Lab PM: Hummel, Matthew R E-Mail: Matthew.Hummel@et.eurofins.com State of Origin:		Carrier Tracking No(s): 310-90939-25103 1 Page: Page 1 of 1 Job #:	
Due Date Requested TAT Requested (days): Standard TAT Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Purchase Order not required PO #: Project #: 31013849 SSOW#:		Analysis Requested			
Sample Identification MW-7 MW-9 MW-12R MW-15		Sample Date 4.1.24 4.1.24 4.1.24 4.1.24		Sample Time 09:00 10:30 09:30 10:50	
Sample Type (C=Comp, G=grab) G G G G		Matrix (W=water, S=solid, O=waste/oil, etc.) Water Water Water Water		Preservation Code: G G G G	
Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/>		6020B - Client List ICP/MS Metals 8260D - 1.3765_85 - Residue, Non-Filterable (TSS)	
Total Number of Containers:		Special Instructions/Note:			
Preservation Codes: 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:		Preservation Codes: M Hexane N None O AsNaO2 P Na2O4S Q Na2SO3 R Na2S2O3 S H2SO4 T TSP Dodecahydrate U Acetone V MCAA W pH 4-5 Y Trizma Z other (specify)			
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					
Deliverable Requested <input type="checkbox"/> I, II, III, IV, Other (specify)					
Empty Kit Relinquished by:					
Relinquished by: [Signature] Date/Time: 4.1.24 / 1500		Received by: MV Date/Time: 4.2.24 1000			
Relinquished by:		Received by:			
Relinquished by:		Received by:			
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks:			



Login Sample Receipt Checklist

Client: Klingner & Associates PC

Job Number: 310-277915-1

Login Number: 277915

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Costello, Mackenzie K

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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	

GROUNDWATER SAMPLING FORMS



Groundwater Sampling Field Sheet

Disposal Site Name: _____ Permit No.: _____

Well/Piezometer: _____ Weather: _____

Date: _____ Sampler Name: _____

Monitoring Well Details

Construction Data

Borehole Diameter (in): _____ Depth to Top of Screen (ft): _____

Casing Diameter (in): _____ Casing Material: _____

Top of Casing Elevation (ft. MSL): _____ Ground Surface Elevation (ft. MSL): _____

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			
Water Elevation (ft. MSL):			

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time							
Depth to Water (ft)							
Volume Purged ()							
Temp (°F)							
Sp. Cond (umhos/cm)							
pH							
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: _____ Permit No.: _____

Well/Piezometer: _____ Weather: _____

Date: _____ Sampler Name: _____

Monitoring Well Details

Construction Data

Borehole Diameter (in): _____ Depth to Top of Screen (ft): _____

Casing Diameter (in): _____ Casing Material: _____

Top of Casing Elevation (ft. MSL): _____ Ground Surface Elevation (ft. MSL): _____

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			
Water Elevation (ft. MSL):			

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time							
Depth to Water (ft)							
Volume Purged ()							
Temp (°F)							
Sp. Cond (umhos/cm)							
pH							
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: _____ Permit No.: _____

Well/Piezometer: _____ Weather: _____

Date: _____ Sampler Name: _____

Monitoring Well Details

Construction Data

Borehole Diameter (in): _____ Depth to Top of Screen (ft): _____

Casing Diameter (in): _____ Casing Material: _____

Top of Casing Elevation (ft. MSL): _____ Ground Surface Elevation (ft. MSL): _____

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			
Water Elevation (ft. MSL):			

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time							
Depth to Water (ft)							
Volume Purged ()							
Temp (°F)							
Sp. Cond (umhos/cm)							
pH							
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: _____ Permit No.: _____

Well/Piezometer: _____ Weather: _____

Date: _____ Sampler Name: _____

Monitoring Well Details

Construction Data

Borehole Diameter (in): _____ Depth to Top of Screen (ft): _____

Casing Diameter (in): _____ Casing Material: _____

Top of Casing Elevation (ft. MSL): _____ Ground Surface Elevation (ft. MSL): _____

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			
Water Elevation (ft. MSL):			

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time							
Depth to Water (ft)							
Volume Purged ()							
Temp (°F)							
Sp. Cond (umhos/cm)							
pH							
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____

2024 METHANE SUMMARY



Engineers • Architects • Surveyors

Date 03/04/24
Eng Proj # 21-2010

Inspected by STT
Checked by JAC

METHANE GAS MEASUREMENTS

FACILITY INFORMATION

CITY OF KEOKUK SANITARY
LANDFILL

PERMIT NUMBER 56-SDP-04-77C PERMIT ISSUED 9/10/1992, EXPIRES 9/10/2024

INSPECTION INFORMATION

TAKEN BY: STT DATE: March 4, 2024
EQUIPMENT: LANDTEC GEM 5000, TUBING ATTACHED TO PVC CAP WITH BARBED HOSE FITTING / TUBING ATTACHED TO SAMPLE PORTS ON GAS VENTS

WEATHER CONDITIONS CLOUDY

WIND: 10 MPH EAST TEMPERATURE: 74 DEGREES FAHRENHEIT

LOCATION	% LOWER EXPLOSIVE LIMIT	TIME OF MEASUREMENT	CO2 CONTENT	O2 CONTENT	COMMENTS
GP #1	0.0%	10:45 AM	1.9%	18.9%	
GP #2	16.5%	10:58 AM	12.1%	9.8%	0.8% CH4
GP #3	46.1%	10:51 AM	23.0%	5.1%	2.3% CH4
GP #4	0.0%	11:00 AM	2.6%	14.3%	

** METHANE LOWER EXPLOSIVE LIMIT = 5%
** METHANE UPPER EXPLOSIVE LIMIT = 15%

HISTORIC METHANE SUMMARY

2024 ANNUAL INSPECTION DOCUMENTS



Date 03/04/24 Inspected by JAC
 Eng Proj # 21-2010

CLOSED LANDFILL INSPECTION CHECKLIST

CITY OF KEOKUK LANDFILL (NORTH) **LANDFILL CONTACTS: Brian Carroll, Public Works Director**
PERMIT NUMBER 56-SDP-04-77C **PERMIT ISSUED 9/10/1992, EXPIRES 9/10/2024**

Weather Conditions: 70F, Cloudy

GENERAL

1.) Landfill ID and contact info posted?	Yes
2.) Is entrance gate locked?	Yes
3.) Entrance Road Conditions	Good

COVER

4.) Condition of Final Cover: Vegetation	Generally good
5.) Has topsoil been placed on the landfill?	Only in areas that received fill
6.) Has the landfill been properly graded and seeded?	Generally yes. Some areas of ponded water were noted, see attached photo log.

EROSION

7.) Is drainage and erosion being controlled on the landfill?	Yes
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LEACHATE

8.) Is there evidence of leachate on the surface of the landfill?	No.
9.) Is there any leachate flows leaving the site?	Seep observed by DNR near outfall south of leachate collection area.
10.) Has the landfill submitted plans for a leachate collection/treatment system?	Yes
11.) Has the approved leachate collection and treatment system been constructed?	Yes
12.) Does the landfill have a permit to discharge leachate?	No

LANDFILL GAS

13.) Is there evidence of landfill gas problems?	No odors present. Took landfill gas measurements, see attached.
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MONITORING WELLS

14.) Are monitoring wells in good condition?	Yes
15.) Are monitoring wells marked and identified?	Yes

MISCELLANEOUS

16.) Is there evidence of open burning?	No
17.) Is there evidence of open dumping, litter?	No
18.) Is there evidence of rodents or insects as a result of improper landfilling operations?	No

Additional Comments:

