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Doc # 109447

**DNR SPECIAL USE PERMIT
07-BUD-20-02**

**BMC AGGREGATES END USER
REPORT
FOR YEAR 2023
SUBMITTED MARCH 1, 2024**

**IN COMPLIANCE WITH SPECIAL CONDITION #7
AS PROSCRIBED IN THE PERMIT**

**SUBMITTED BY
SHERMAN LUNDY
GEOLOGIST AND PROJECT MANAGER
BMC AGGREGATES
101 BMC DRIVE
ELK RUN HEIGHTS, IA 50707**



BMC Aggregates L.C.

101 BMC Drive • Elk Run Heights, IA 50707
P.O. Box 2277 • Waterloo, IA 50704
Ph. 319-235-6583 • Fax 319-235-7065

February 27, 2024

Chad Stobbe
Environmental Specialist Senior
Solid Waste and Contaminated Sites Section
Iowa Department of Natural Resources
502 E. 9th St.
Des Moines, IA 50319-0034

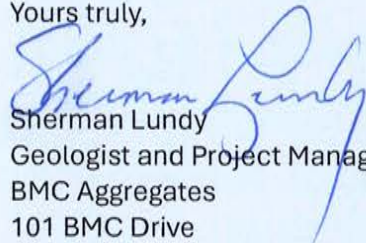
Dear Chad:

Enclosed, please find the March 1, 2024, summary report of the placement of Beneficial Use Materials (CCPs and Foundry Sand) at the BMC Aggregates South Quarry facility located at 11305 Dysart Rd., LaPorte City, Iowa 50651, in accordance with the requirements of DNR Special Use Permit, 07-BUD-20-02, in compliance with Special Condition #7 as proscribed in the Permit.

These pages contain the required information and data sheets for the year 2023, as part of the Special Condition #7 of the Permit.

If there are any questions or concerns, please contact me and our Engineering Consultant, SCS Engineers Consulting.

Yours truly,


Sherman Lundy
Geologist and Project Manager
BMC Aggregates
101 BMC Drive
Elk Run Height, Iowa 50707

RECEIVED

MAR 01 2024

**DNR SPECIAL USE PERMIT 07-BUD-20-02
BMC AGGREGATES, END USER REPORT
MARCH 1, 2024
IN COMPLIANCE WITH SPECIAL CONDITION #7
AS PROSCRIBED IN THE PERMIT**

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Section 7: Brief Summary of Report.
(Including BMC Biannual Test Results from Keystone Labs)

Section 1: Certified By Product Generators Laboratory Results.

All of the Quarterly Certified Laboratory Reports for 2023, from the By-Product Generators have been furnished to BMC Aggregates (as the End-User) and the IDNR Solid Waste Division. As a result, only the DNR Form for Analytical Testing Results accompanies this report. **Notice: UNI (University of Northern Iowa) and ISU (Iowa State University) have discontinued bringing fly ash and coal residue products to the BUD site for the last several years.**

Only the University of Iowa and Deere Foundry (Waterloo) brought materials to the Beneficial Use Site during the calendar year of 2023.

The IDNR Certified Analytical Test Reports for each quarter of the year, 2023, for the University of Iowa and Deere Foundry can be found in this section. As noted above, all of these reports were formerly filed with IDNR Solid Waste Division and BMC Aggregates for review prior to this submission.

**JOHN DEERE
2023**

QUARTERLY REPORTS



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.
Lab Report Date: 1/26/2023
By-Product Generator: John Deere Foundry
City: Waterloo, State: IA, Zip: 50701
By-Product Name: Refractory Brick Bunker

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*Deere
 1st Quarter
 2023*

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)						Total Metals		
Required	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.0023 mg/L	31	0.70		mg/kg
X	Arsenic	0.01	0.1	<0.0032 mg/L	17	4.97		mg/kg
X	Barium	2	20	0.0164 mg/L	15000	61.20		mg/kg
X	Beryllium	0.004	0.04	<0.0005 mg/L	110	0.40		mg/kg
X	Boron				16000	54.90		mg/kg
X	Cadmium	0.005	0.05	<0.0009 mg/L	70	0.30		mg/kg
X	Chromium	0.1	1	<0.0085 mg/L		210	147.00	mg/kg
					(Hexavalent - VI)	210	<1.5	mg/kg
					(Trivalent - III)	97000	147	mg/kg
X	Cobalt				23	5.67		mg/kg
X	Copper	1.3	13	<0.0043 mg/L	15000	427.00		mg/kg
X	Fluoride	4	40	2.8 mg/L	4700	123.00		mg/kg
X	Lead	0.015	0.15	0.0067 mg/L	400	541.00		mg/kg
X	Lithium				160	32.00		mg/kg
X	Manganese				10000	610.00		mg/kg
X	Mercury	0.002	0.02	<0.00015 mg/L	23	<0.02		mg/kg
X	Molybdenum				390	16.70		mg/kg
X	Nickel				1500	51.30		mg/kg
X	Selenium	0.05	0.5	<0.0021 mg/L	390	7.60		mg/kg
X	Silver				370	3.90		mg/kg
X	Thallium	0.002	0.02	0.0014 mg/L	0.78	<0.2		mg/kg
X	Vanadium				350	25.90		mg/kg
X	Zinc				23000	12300.00		mg/kg

Exceeds
 ↓
Cumulative Risk Factor
 ↓
 ?

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.24	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	2.72	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.061	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	11.1

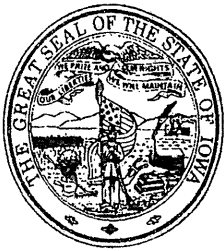
BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>West Sand Dock</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)						Total Metals			
Required	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.001	mg/L	31	<0.33	mg/kg	
X	Arsenic	0.01	0.1	0.0032	mg/L	17	0.85	mg/kg	
X	Barium	2	20	0.0147	mg/L	15000	26.60	mg/kg	
X	Beryllium	0.004	0.04	<0.0005	mg/L	110	0.20	mg/kg	
X	Boron					16000	<5.7	mg/kg	
X	Cadmium	0.005	0.05	<0.0009	mg/L	70	0.20	mg/kg	
X	Chromium	0.1	1	0.009	mg/L	(Hexavalent - VI)	210	<1.5	mg/kg
						(Trivalent - III)	97000	4.31	mg/kg
X	Cobalt					23	0.97	mg/kg	
X	Copper	1.3	13	0.0198	mg/L	15000	15.70	mg/kg	
X	Fluoride	4	40	0.6	mg/L	4700	53.60	mg/kg	
X	Lead	0.015	0.15	0.0044	mg/L	400	4.15	mg/kg	
X	Lithium					160	1.00	mg/kg	
X	Manganese					10000	34.00	mg/kg	
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg	
X	Molybdenum					390	1.00	mg/kg	
X	Nickel					1500	3.90	mg/kg	
X	Selenium	0.05	0.5	<0.0021	mg/L	390	<1.7	mg/kg	
X	Silver					370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0013	mg/L	0.78	<0.2	mg/kg	
X	Vanadium					350	1.42	mg/kg	
X	Zinc					23000	22.60	mg/kg	

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

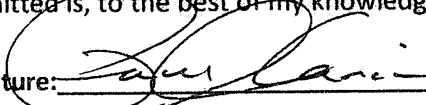
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.252	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.016	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.284	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.039	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>East Dust Pelletizer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

*	Required Contaminant	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals			
		MCL	10 X MCL	Test Result		Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.001	mg/L	31	<0.33	mg/kg	
X	Arsenic	0.01	0.1	<0.0032	mg/L	17	2.72	mg/kg	
X	Barium	2	20	0.0189	mg/L	15000	61.00	mg/kg	
X	Beryllium	0.004	0.04	<0.0005	mg/L	110	0.30	mg/kg	
X	Boron					16000	9.10	mg/kg	
X	Cadmium	0.005	0.05	<0.0009	mg/L	70	<0.2	mg/kg	
X	Chromium	0.1	1	0.0101	mg/L		210	83.90	mg/kg
						(Hexavalent - VI)	210	<1.5	mg/kg
						(Trivalent - III)	97000	83.9	mg/kg
X	Cobalt					23	4.65	mg/kg	
X	Copper	1.3	13	0.0933	mg/L	15000	224.00	mg/kg	
X	Fluoride	4	40	4	mg/L	4700	387.00	mg/kg	
X	Lead	0.015	0.15	0.0071	mg/L	400	8.91	mg/kg	
X	Lithium					160	3.00	mg/kg	
X	Manganese					10000	644.00	mg/kg	
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg	
X	Molybdenum					390	11.10	mg/kg	
X	Nickel					1500	35.50	mg/kg	
X	Selenium	0.05	0.5	0.0027	mg/L	390	<1.7	mg/kg	
X	Silver					370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0013	mg/L	0.78	<0.2	mg/kg	
X	Vanadium					350	6.56	mg/kg	
X	Zinc					23000	75.10	mg/kg	

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

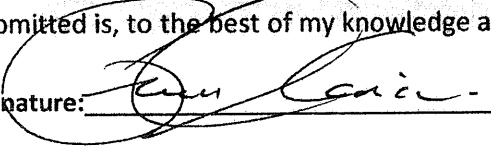
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.309	mg/L		Carbon	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.018	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.066	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.2

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

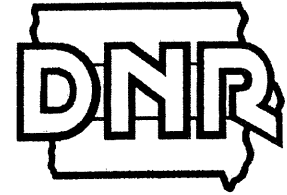
Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>802 Dust Pelletizer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.0012 mg/L	31	<0.33	mg/kg	
X	Arsenic	0.01	0.1	0.0057 mg/L	17	1.03	mg/kg	
X	Barium	2	20	0.126 mg/L	15000	21.90	mg/kg	
X	Beryllium	0.004	0.04	0.0011 mg/L	110	0.20	mg/kg	
X	Boron				16000	<5.7	mg/kg	
X	Cadmium	0.005	0.05	<0.0009 mg/L	70	<0.2	mg/kg	
X	Chromium	0.1	1	0.0189 mg/L		210	3.90	mg/kg **
					(Hexavalent - VI)	210	<1.5	mg/kg
					(Trivalent - III)	97000	3.85	mg/kg
X	Cobalt				23	1.29	mg/kg	
X	Copper	1.3	13	0.0455 mg/L	15000	11.50	mg/kg	
X	Fluoride	4	40	2.2 mg/L	4700	111.00	mg/kg	
X	Lead	0.015	0.15	0.02 mg/L	400	3.50	mg/kg	
X	Lithium				160	1.00	mg/kg	
X	Manganese				10000	37.90	mg/kg	
X	Mercury	0.002	0.02	<0.00015 mg/L	23	<0.02	mg/kg	
X	Molybdenum				390	1.00	mg/kg	
X	Nickel				1500	3.00	mg/kg	
X	Selenium	0.05	0.5	0.0032 mg/L	390	<1.7	mg/kg	
X	Silver				370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0013 mg/L	0.78	<0.2	mg/kg	
X	Vanadium				350	1.67	mg/kg	
X	Zinc				23000	17.70	mg/kg	

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

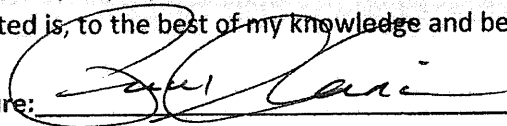
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.246	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.006	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.051	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.032	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.9

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>871 Baghouse Dust</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.0009	mg/L	31	0.93	mg/kg
X	Arsenic	0.01	0.1	<0.0032	mg/L	17	11.70	mg/kg
X	Barium	2	20	<0.0059	mg/L	15000	31.70	mg/kg
X	Beryllium	0.004	0.04	<0.0005	mg/L	110	0.20	mg/kg
X	Boron					16000	10.90	mg/kg
X	Cadmium	0.005	0.05	<0.0009	mg/L	70	<0.2	mg/kg
X	Chromium	0.1	1	<0.0085	mg/L	210	879.00	mg/kg**
						(Hexavalent - VI)	<1.5	mg/kg
						210	(Trivalent - III)	879
		97000						
X	Cobalt					23	19.60	mg/kg
X	Copper	1.3	13	<0.0043	mg/L	15000	1110.00	mg/kg
X	Fluoride	4	40	0.5	mg/L	4700	67.20	mg/kg
X	Lead	0.015	0.15	<0.0023	mg/L	400	5.67	mg/kg
X	Lithium					160	3.00	mg/kg
X	Manganese					10000	3750.00	mg/kg
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	158.00	mg/kg
X	Nickel					1500	301.00	mg/kg
X	Selenium	0.05	0.5	<0.0021	mg/L	390	3.50	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0013	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	50.20	mg/kg
X	Zinc					23000	30.40	mg/kg

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

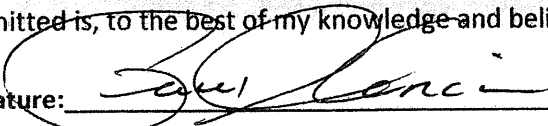
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals				Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
X	Arsenic	5	0.016 mg/L		Benzene	0.5 mg/L	mg/L
X	Barium	100	0.238 mg/L		Carbon tetrachloride	0.5 mg/L	mg/L
X	Cadmium	1	<0.003 mg/L		Chlorobenzene	100.0 mg/L	mg/L
X	Chromium	5	<0.005 mg/L		Chloroform	6.0 mg/L	mg/L
X	Lead	5	0.027 mg/L		1,2-Dichloroethane	0.5 mg/L	mg/L
X	Mercury	0.2	<0.00012 mg/L		1,1-Dichloroethylene	0.7 mg/L	mg/L
X	Selenium	1	0.104 mg/L		Methyl ethyl ketone	200.0 mg/L	mg/L
X	Silver	5	<0.004 mg/L		Tetrachloroethylene	0.7 mg/L	mg/L
					Trichloroethylene	0.5 mg/L	mg/L
					Vinyl chloride	0.2 mg/L	mg/L
Pesticides				Semi-Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
	Chlordane	0.03 mg/L	mg/L		o-Cresol	200.0 mg/L	mg/L
	Endrin	0.02 mg/L	mg/L		m-Cresol	200.0 mg/L	mg/L
	Heptachlor (& its epoxide)	0.008 mg/L	mg/L		p-Cresol	200.0 mg/L	mg/L
	Lindane	0.4 mg/L	mg/L		Cresol	200.0 mg/L	mg/L
	Methoxychlor	10.0 mg/L	mg/L		1,4-Dichlorobenzene	7.5 mg/L	mg/L
	Toxaphene	0.5 mg/L	mg/L		2,4-Dinitrotoluene	0.13 mg/L	mg/L
					Hexachlorobenzene	0.13 mg/L	mg/L
					Hexachlorobutadiene	0.5 mg/L	mg/L
					Hexachloroethane	3.0 mg/L	mg/L
					Nitrobenzene	2.0 mg/L	mg/L
Herbicides					Pentachlorophenol	100.0 mg/L	mg/L
	2,4-D	10.0 mg/L	mg/L		Pyridine	5.0 mg/L	mg/L
	2,4,5-TP (Silvex)	1.0 mg/L	mg/L		2,4,5-Trichlorophenol	400.0 mg/L	mg/L
					2,4,6-Trichlorophenol	2.0 mg/L	mg/L

By-Product pH	
X	9.6

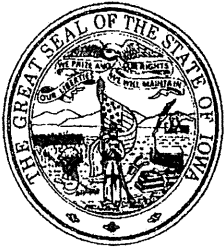
BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>850/3 Cleaning Room</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals			
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.0014	mg/L	31	0.92	mg/kg	
X	Arsenic	0.01	0.1	<0.0032	mg/L	17	10.50	mg/kg	
X	Barium	2	20	<0.0059	mg/L	15000	29.40	mg/kg	
X	Beryllium	0.004	0.04	<0.0005	mg/L	110	0.20	mg/kg	
X	Boron					16000	7.00	mg/kg	
X	Cadmium	0.005	0.05	<0.0009	mg/L	70	<0.2	mg/kg	
X	Chromium	0.1	1	<0.0085	mg/L		210	650.00	mg/kg**
						(Hexavalent - VI)	210	<1.5	mg/kg
						(Trivalent - III)	97000	650	mg/kg
X	Cobalt					23	19.30	mg/kg	
X	Copper	1.3	13	<0.0043	mg/L	15000	1000.00	mg/kg	
X	Fluoride	4	40	1.9	mg/L	4700	91.10	mg/kg	
X	Lead	0.015	0.15	0.0029	mg/L	400	9.50	mg/kg	
X	Lithium					160	2.00	mg/kg	
X	Manganese					10000	2450.00	mg/kg	
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg	
X	Molybdenum					390	103.00	mg/kg	
X	Nickel					1500	237.00	mg/kg	
X	Selenium	0.05	0.5	<0.0021	mg/L	390	9.50	mg/kg	
X	Silver					370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0013	mg/L	0.78	<0.2	mg/kg	
X	Vanadium					350	34.30	mg/kg	
X	Zinc					23000	52.60	mg/kg	

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.288	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.019	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.049	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.1

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>1/26/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>804 Baghouse Trailer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals			
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	0.0022	mg/L	31	<0.33	mg/kg	
X	Arsenic	0.01	0.1	0.01	mg/L	17	2.43	mg/kg	
X	Barium	2	20	0.0498	mg/L	15000	85.40	mg/kg	
X	Beryllium	0.004	0.04	<0.0005	mg/L	110	0.60	mg/kg	
X	Boron					16000	11.80	mg/kg	
X	Cadmium	0.005	0.05	0.0009	mg/L	70	0.20	mg/kg	
X	Chromium	0.1	1	<0.0085	mg/L		210	7.70	mg/kg**
						(Hexavalent - VI)	210	<1.5	mg/kg
						(Trivalent - III)	97000	7.7	mg/kg
X	Cobalt					23	2.72	mg/kg	
X	Copper	1.3	13	0.0214	mg/L	15000	32.80	mg/kg	
X	Fluoride	4	40	2.3	mg/L	4700	175.00	mg/kg	
X	Lead	0.015	0.15	0.0108	mg/L	400	11.80	mg/kg	
X	Lithium					160	5.00	mg/kg	
X	Manganese					10000	99.20	mg/kg	
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg	
X	Molybdenum					390	1.30	mg/kg	
X	Nickel					1500	8.10	mg/kg	
X	Selenium	0.05	0.5	0.0038	mg/L	390	<1.7	mg/kg	
X	Silver					370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0013	mg/L	0.78	<0.2	mg/kg	
X	Vanadium					350	5.74	mg/kg	
X	Zinc					23000	72.30	mg/kg	

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

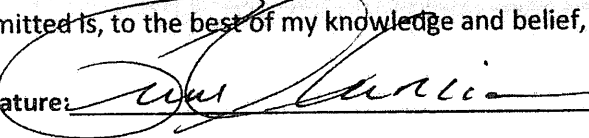
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.253	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.059	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.063	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10

BY-PRODUCT GENERATOR CERTIFICATION

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Signature:  Date: 1-31-23

Printed Name: Paul Garcia Title: Foundry Operations Manager

(*) Required contaminant



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.	Send com laboratory Iowa Dep Land Qua Solid Was 502 East Des Moine For quest contact t
Lab Report Date: 5/12/2023	
By-Product Generator: John Deere Foundry	
City: Waterloo, State: IA, Zip: 50701	
By-Product Name: 871 Baghouse Dust	

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2ND Quarter
2023*

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	<0.0100 mg/L	31	0.77	mg/kg	
X	Arsenic	0.01	0.1	<0.0100 mg/L	17	10.1	mg/kg	
X	Barium	2	20	<0.0100 mg/L	15000	33.8	mg/kg	
X	Beryllium	0.004	0.04	<0.0100 mg/L	110	0.2	mg/kg	
X	Boron				16000	8.4	mg/kg	
X	Cadmium	0.005	0.05	<0.0050 mg/L	70	<0.2	mg/kg	
					210	785	mg/kg**	
X	Chromium	0.1	1	<0.0200 mg/L	(Hexavalent - VI) 210	<1.5	mg/kg	
					(Trivalent - III) 97000	785	mg/kg	
X	Cobalt				23	18.8	mg/kg	
X	Copper	1.3	13	0.0103 mg/L	15000	1080	mg/kg	
X	Fluoride	4	40	0.6 mg/L	4700	65.6	mg/kg	
X	Lead	0.015	0.15	<0.0100 mg/L	400	<2.10	mg/kg	
X	Lithium				160	3	mg/kg	
X	Manganese				10000	3910	mg/kg	
X	Mercury	0.002	0.02	<0.00015 mg/L	23	<0.02	mg/kg	
X	Molybdenum				390	139	mg/kg	
X	Nickel				1500	271	mg/kg	
X	Selenium	0.05	0.5	<0.0100 mg/L	390	8.8	mg/kg	
X	Silver				370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0050 mg/L	0.78	<0.2	mg/kg	
X	Vanadium				350	44.7	mg/kg	
X	Zinc				23000	30.4	mg/kg	

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

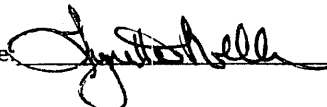
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	0.045	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.335	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.096	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
Herbicides						Nitrobenzene	2.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result			Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

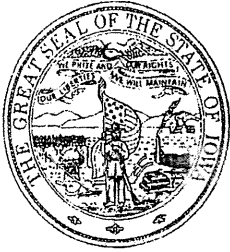
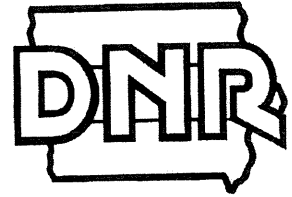
By-Product pH	
X	10.4

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/24/23
 Printed Name: Lynette Telleen Title: Foundry Operations Manager

Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.

Lab Report Date: 5/12/2023

By-Product Generator: John Deere Foundry

City: Waterloo, State: IA, Zip: 50701

By-Product Name: Refractory Brick Bunker

Send completed report form(s) and associated laboratory analytics to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 East 9th Street
Des Moines, IA 50319-0034

For questions concerning this report form, please contact the DNR at (515) 725-8351.

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)					Total Metals			
	* Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	<0.0100	mg/L	31	0.87	mg/kg	
X	Arsenic	0.01	0.1	<0.0100	mg/L	17	7.26	mg/kg	
X	Barium	2	20	<0.0100	mg/L	15000	29.1	mg/kg	
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.3	mg/kg	
X	Boron					16000	65.8	mg/kg	
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	<0.2	mg/kg	
X	Chromium	0.1	1	<0.0200	mg/L	210	236	mg/kg	
						(Hexavalent - VI)	210	<1.5	mg/kg
						(Trivalent - III)	97000	236	mg/kg
X	Cobalt					23	16.1	mg/kg	
X	Copper	1.3	13	<0.0100	mg/L	15000	1620	mg/kg	
X	Fluoride	4	40	<0.1	mg/L	4700	<0.2	mg/kg	
X	Lead	0.015	0.15	<0.0100	mg/L	400	6.77	mg/kg	
X	Lithium					160	1	mg/kg	
X	Manganese					10000	1320	mg/kg	
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg	
X	Molybdenum					390	30.9	mg/kg	
X	Nickel					1500	94.8	mg/kg	
X	Selenium	0.05	0.5	<0.0100	mg/L	390	8.3	mg/kg	
X	Silver					370	<0.2	mg/kg	
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg	
X	Vanadium					350	34.8	mg/kg	
X	Zinc					23000	248	mg/kg	

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	0.015	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.163	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.109	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	<0.032	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result			Pyridine	5.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.0

BY-PRODUCT GENERATOR CERTIFICATION

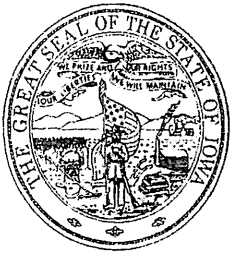
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/18/23

Printed Name: Lynette Telleen Title: Foundry Operations Manager

(* Required contaminant

Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.

Lab Report Date: 5/12/2023

By-Product Generator: John Deere Foundry

City: Waterloo, State: IA, Zip: 50701

By-Product Name: West Sand Dock

Send completed report form(s) and associated laboratory analytics to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 East 9th Street
Des Moines, IA 50319-0034

For questions concerning this report form, please contact the DNR at (515) 725-8351.

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)					Total Metals		
	* Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.0100	mg/L	31	<0.33	mg/kg
X	Arsenic	0.01	0.1	0.0115	mg/L	17	0.99	mg/kg
X	Barium	2	20	0.288	mg/L	15000	30.8	mg/kg
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.2	mg/kg
X	Boron					16000	6.1	mg/kg
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	<0.2	mg/kg
						210	5.9	mg/kg
X	Chromium	0.1	1	<0.0200	mg/L	(Hexavalent - VI)	<1.5	mg/kg
						(Trivalent - III)	5.92	mg/kg
						97000		
X	Cobalt					23	0.84	mg/kg
X	Copper	1.3	13	0.0435	mg/L	15000	16.8	mg/kg
X	Fluoride	4	40	1.1	mg/L	4700	69.6	mg/kg
X	Lead	0.015	0.15	0.0509	mg/L	400	4.06	mg/kg
X	Lithium					160	2	mg/kg
X	Manganese					10000	33.5	mg/kg
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	1.1	mg/kg
X	Nickel					1500	3.6	mg/kg
X	Selenium	0.05	0.5	<0.0100	mg/L	390	2.4	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	1.92	mg/kg
X	Zinc					23000	18.4	mg/kg

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

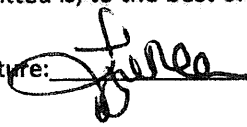
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

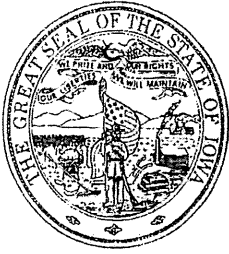
Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.242	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.008	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.048	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.8

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/18/23
 Printed Name: Lynette Telleen Title: Foundry Operations Manager



Beneficial Use ID # 07-BUD-20-02

Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>5/12/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>East Dust Pelletizer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result		
X	Antimony	0.006	0.06	<0.0100	mg/L	31	0.39	mg/kg
X	Arsenic	0.01	0.1	<0.0100	mg/L	17	3.94	mg/kg
X	Barium	2	20	0.0676	mg/L	15000	45.6	mg/kg
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.3	mg/kg
X	Boron					16000	8.8	mg/kg
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	<0.2	mg/kg
X	Chromium	0.1	1	0.0320	mg/L	210	125	mg/kg
						(Hexavalent - VI)	<1.5	mg/kg
						210	125	mg/kg
	(Trivalent - III)	97000						
X	Cobalt					23	7.02	mg/kg
X	Copper	1.3	13	0.683	mg/L	15000	361	mg/kg
X	Fluoride	4	40	3.2	mg/L	4700	164	mg/kg
X	Lead	0.015	0.15	0.0331	mg/L	400	7.29	mg/kg
X	Lithium					160	3	mg/kg
X	Manganese					10000	781	mg/kg
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	17.2	mg/kg
X	Nickel					1500	45.3	mg/kg
X	Selenium	0.05	0.5	<0.0100	mg/L	390	5.8	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	8.28	mg/kg
X	Zinc					23000	74.1	mg/kg

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg,
 further analysis shall be conducted to
 determine hexavalent and trivalent results.

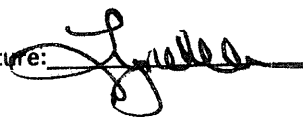
Acidity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	0.035	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.389	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.549	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.068	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.8

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/18/23
 Printed Name: Lynette Telleen Title: Foundry Operations Manager

(* Required contaminant

Public



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: 5/12/2023</p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: 802 Dust Pelletizer</p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.0100	mg/L	31	<0.33	mg/kg
X	Arsenic	0.01	0.1	0.0120	mg/L	17	1.82	mg/kg
X	Barium	2	20	0.394	mg/L	15000	51.0	mg/kg
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.4	mg/kg
X	Boron					16000	8.0	mg/kg
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	<0.2	mg/kg
X	Chromium	0.1	1	<0.0200	mg/L	210	4.2	mg/kg **
						(Hexavalent - VI)	<1.5	mg/kg
						210 (Trivalent - III)	4.23	mg/kg
X	Cobalt					23	1.49	mg/kg
X	Copper	1.3	13	0.0742	mg/L	15000	20.2	mg/kg
X	Fluoride	4	40	2.2	mg/L	4700	37.7	mg/kg
X	Lead	0.015	0.15	0.0504	mg/L	400	8.82	mg/kg
X	Lithium					160	3	mg/kg
X	Manganese					10000	64.8	mg/kg
X	Mercury	0.002	0.02	<0.00022	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	1.5	mg/kg
X	Nickel					1500	5.2	mg/kg
X	Selenium	0.05	0.5	<0.0100	mg/L	390	3.6	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	3.20	mg/kg
X	Zinc					23000	105	mg/kg

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

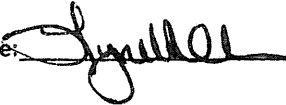
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

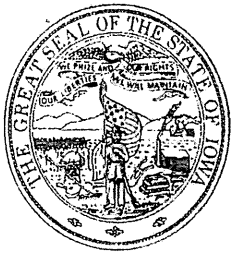
Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.214	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.052	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.8

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/18/23
 Printed Name: Lynette Telleen Title: Foundry Operations Manager



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.

Lab Report Date: 5/12/2023

By-Product Generator: John Deere Foundry

City: Waterloo, State: IA, Zip: 50701

By-Product Name: 850/3 Cleaning Room

Send completed report form(s) and associated laboratory analytics to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 East 9th Street
Des Moines, IA 50319-0034

For questions concerning this report form, please contact the DNR at (515) 725-8351.

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)						Total Metals		
Required	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.0100	mg/L	31	0.70	mg/kg
X	Arsenic	0.01	0.1	<0.0100	mg/L	17	7.37	mg/kg
X	Barium	2	20	<0.0100	mg/L	15000	68.8	mg/kg
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.4	mg/kg
X	Boron					16000	10.9	mg/kg
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	<0.2	mg/kg
						210	378	mg/kg**
X	Chromium	0.1	1	<0.0200	mg/L	(Hexavalent - VI) 210	<1.5	mg/kg
						(Trivalent - III) 97000	378	mg/kg
X	Cobalt					23	13.8	mg/kg
X	Copper	1.3	13	<0.0100	mg/L	15000	737	mg/kg
X	Fluoride	4	40	1.9	mg/L	4700	26.2	mg/kg
X	Lead	0.015	0.15	<0.0100	mg/L	400	6.01	mg/kg
X	Lithium					160	3	mg/kg
X	Manganese					10000	1970	mg/kg
X	Mercury	0.002	0.02	<0.00015	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	70.2	mg/kg
X	Nickel					1500	145	mg/kg
X	Selenium	0.05	0.5	<0.0100	mg/L	390	8.3	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	24.3	mg/kg
X	Zinc					23000	65.8	mg/kg

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.


Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	0.076	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.501	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.423	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.085	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.2

BY-PRODUCT GENERATOR CERTIFICATION

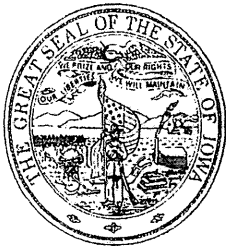
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 5/18/23

Printed Name: Lynette Telleen Title: Foundry Operations Manager

(* Required contaminant

Public



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>5/12/2023</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>804 Baghouse Trailer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
		MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	Test Result	
X	Antimony	0.006	0.06	<0.0100	mg/L	31	<0.33	mg/kg
X	Arsenic	0.01	0.1	0.0221	mg/L	17	2.50	mg/kg
X	Barium	2	20	0.371	mg/L	15000	89.3	mg/kg
X	Beryllium	0.004	0.04	<0.0100	mg/L	110	0.6	mg/kg
X	Boron					16000	12.8	mg/kg
X	Cadmium	0.005	0.05	<0.0050	mg/L	70	0.2	mg/kg
						210	7.6	mg/kg**
X	Chromium	0.1	1	<0.0200	mg/L	(Hexavalent - VI)	<1.5	mg/kg
						210		
						(Trivalent - III)	7.60	mg/kg
						97000		
X	Cobalt					23	2.35	mg/kg
X	Copper	1.3	13	0.0742	mg/L	15000	22.6	mg/kg
X	Fluoride	4	40	2.3	mg/l	4700	231	mg/kg
X	Lead	0.015	0.15	0.0660	mg/L	400	11.3	mg/kg
X	Lithium					160	6	mg/kg
X	Manganese					10000	89.6	mg/kg
X	Mercury	0.002	0.02	<0.00022	mg/L	23	<0.02	mg/kg
X	Molybdenum					390	1.6	mg/kg
X	Nickel					1500	7.6	mg/kg
X	Selenium	0.05	0.5	<0.0100	mg/L	390	6.5	mg/kg
X	Silver					370	<0.2	mg/kg
X	Thallium	0.002	0.02	<0.0050	mg/L	0.78	<0.2	mg/kg
X	Vanadium					350	6.16	mg/kg
X	Zinc					23000	60.8	mg/kg

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg,
 further analysis shall be conducted to
 determine hexavalent and trivalent results.


Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.012	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.233	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	0.003	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.005	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.013	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.00012	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.057	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.004	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
						Pentachlorophenol	100.0 mg/L		mg/L
Herbicides						Pyridine	5.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result			2,4,5-Trichlorophenol	400.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		2,4,6-Trichlorophenol	2.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L					

By-Product pH	
X	10.0

BY-PRODUCT GENERATOR CERTIFICATION

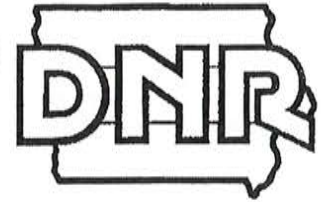
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Signature:  Date: 5/18/23

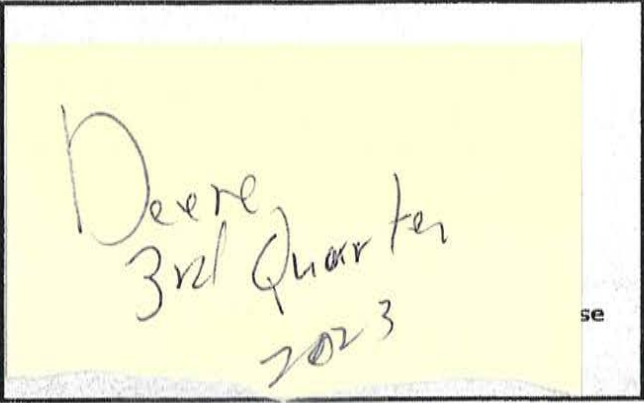
Printed Name: Lynette Telleen Title: Foundry Operations Manager



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.
Lab Report Date: 8//23
By-Product Generator: John Deere Foundry
City: Waterloo, State: IA, Zip: 50701
By-Product Name: 802 Dust Pelletizer



ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	<5	mg/kg
X	Barium	2	20	0.149	mg/L	15000	63.20	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	<10	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
						210	6.30	mg/kg **
X	Chromium	0.1	1	<0.05	mg/L	(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	6.35	mg/kg
						97000		
X	Cobalt					23	1.85	mg/kg
X	Copper	1.3	13	0.0363	mg/L	15000	24.80	mg/kg
X	Fluoride	4	40	2.1	mg/L	4700	269.00	mg/kg
X	Lead	0.015	0.15	0.0233	mg/L	400	9.82	mg/kg
X	Lithium					160	<5	mg/kg
X	Manganese					10000	70.90	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	2.10	mg/kg
X	Nickel					1500	7.20	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	4.90	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	<5	mg/kg

(*) Required contaminant

(**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

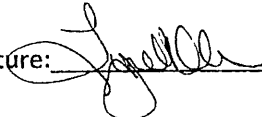
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

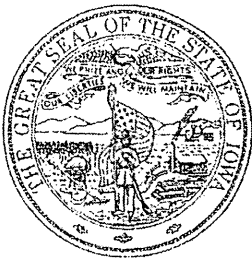
X	Zinc			23000	50.20	mg/kg			
Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.189	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.01	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	<0.05	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 8/30/23



Beneficial Use Determination: Analytical Testing Report



Correction

DNR Certified Lab: Keystone Laboratories, Inc.

Lab Report Date: 8//23

By-Product Generator: John Deere Foundry

City: Waterloo, State: IA, Zip: 50701

By-Product Name: 804 Baghouse Trailer

Send completed report form(s) and associated laboratory analytics to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 East 9th Street
Des Moines, IA 50319-0034

For questions concerning this report form, please contact the DNR at (515) 725-8351.

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	0.0252	mg/L	17	7.60	mg/kg
X	Barium	2	20	<0.02	mg/L	15000	179.00	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	18.00	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
						210	15.20	mg/kg**
X	Chromium	0.1	1	<0.05	mg/L	(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	15.2	mg/kg
						97000		
X	Cobalt					23	4.34	mg/kg
X	Copper	1.3	13	<0.02	mg/L	15000	48.70	mg/kg
X	Fluoride	4	40	3.6	mg/L	4700	542.00	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	24.30	mg/kg
X	Lithium					160	11.00	mg/kg
X	Manganese					10000	162.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	2.00	mg/kg
X	Nickel					1500	15.70	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	10.50	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	10.00	mg/kg

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

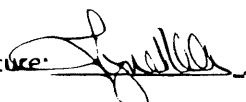
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X		Zinc	23000		141.00	mg/kg		
Metals				Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L	mg/L
X	Barium	100	0.21	mg/L		Carbon	0.5 mg/L	mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0	mg/L
X	Chromium	5	<0.01	mg/L		Chloroform	6.0 mg/L	mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L	mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L	mg/L
X	Selenium	1	0.058	mg/L		Methyl ethyl ketone	200.0	mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L	mg/L
						Trichloroethylene	0.5 mg/L	mg/L
						Vinyl chloride	0.2 mg/L	mg/L
Pesticides				Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0	mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0	mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0	mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0	mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L	mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L	mg/L
						Hexachlorobenzene	0.13 mg/L	mg/L
						Hexachlorobutadiene	0.5 mg/L	mg/L
						Hexachloroethane	3.0 mg/L	mg/L
						Nitrobenzene	2.0 mg/L	mg/L
Herbicides								
*	Contaminant	Regulatory Limit	Test Result			Pentachlorophenol	100.0 mg/L	mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L	mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L	mg/L
						2,4,6-Trichlorophenol	2.0 mg/L	mg/L

By-Product pH	
X	10.1

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 8/30/23

(* Required contaminant
Public



Beneficial Use Determination: Analytical Testing Report



Corrections

<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: 8//23</p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: 871 Baghouse Dust</p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

* Required	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)					Total Metals		
	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	16.50	mg/kg
X	Barium	2	20	<0.02	mg/L	15000	32.10	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	11.00	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
X	Chromium	0.1	1	<0.05	mg/L	210	886.00	mg/kg**
						(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	886	mg/kg
X	Cobalt					23	18.60	mg/kg
X	Copper	1.3	13	<0.02	mg/L	15000	1170.00	mg/kg
X	Fluoride	4	40	0.5	mg/L	4700	91.70	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	<5	mg/kg
X	Lithium					160	<5	mg/kg
X	Manganese					10000	4070.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	139.00	mg/kg
X	Nickel					1500	302.00	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	7.00	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	49.00	mg/kg

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

< 0.02 mg/L

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X	Zinc	23000		38.30	mg/kg				
Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.222	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.01	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.069	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.5

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 8/30/23

(*) Required contaminant
Public



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc.

Lab Report Date: 8//23

By-Product Generator: John Deere Foundry

City: Waterloo, State: IA, Zip: 50701

By-Product Name: 850/3 Cleaning Room

Send completed report form(s) and associated laboratory analytics to:

Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 East 9th Street
Des Moines, IA 50319-0034

For questions concerning this report form, please contact the DNR at (515) 725-8351.

ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

*	Required Contaminant	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
		MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	14.60	mg/kg
X	Barium	2	20	<0.02	mg/L	15000	20.50	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	10.50	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
X	Chromium	0.1	1	<0.05	mg/L	210	926.00	mg/kg**
						(Hexavalent - VI) 210	<5	mg/kg
						(Trivalent - III) 97000	926	mg/kg
X	Cobalt					23	20.40	mg/kg
X	Copper	1.3	13	<0.02	mg/L	15000	1240.00	mg/kg
X	Fluoride	4	40	0.5	mg/L	4700	82.40	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	<5	mg/kg
X	Lithium					160	<5	mg/kg
X	Manganese					10000	4250.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	159.00	mg/kg
X	Nickel					1500	321.00	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	5.20	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	54.80	mg/kg

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

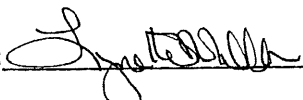
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X	Zinc			23000	52.40	mg/kg			
Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.213	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.01	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	0.059	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.6

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 8/30/23

(* Required contaminant
Public



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>8//23</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>East Dust Pelletizer</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

*	Required Contaminant	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
		MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	6.10	mg/kg
X	Barium	2	20	0.0475	mg/L	15000	72.10	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	11.20	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
X	Chromium	0.1	1	<0.05	mg/L	210	136.00	mg/kg
						(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	136	mg/kg
						97000		
X	Cobalt					23	5.96	mg/kg
X	Copper	1.3	13	0.143	mg/L	15000	324.00	mg/kg
X	Fluoride	4	40	3.8	mg/L	4700	253.00	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	10.60	mg/kg
X	Lithium					160	5.00	mg/kg
X	Manganese					10000	813.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	16.10	mg/kg
X	Nickel					1500	50.90	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	6.60	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	9.92	mg/kg

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

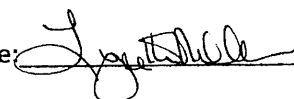
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X	Zinc			23000	121.00	mg/kg			
Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.354	mg/L		Carbon	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0		mg/L
X	Chromium	5	0.705	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	0.045	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	<0.05	mg/L		Methyl ethyl ketone	200.0		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	9.9

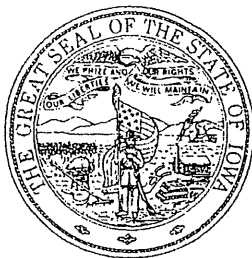
BY-PRODUCT GENERATOR CERTIFICATION

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Signature:  Date: 8/30/23

(* Required contaminant

Public



Beneficial Use Determination: Analytical Testing Report



<p>DNR Certified Lab: Keystone Laboratories, Inc.</p> <p>Lab Report Date: <u>8//23</u></p> <p>By-Product Generator: John Deere Foundry</p> <p>City: Waterloo, State: IA, Zip: 50701</p> <p>By-Product Name: <u>Refractory Brick Bunker</u></p>	<p>Send completed report form(s) and associated laboratory analytics to:</p> <p>Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034</p> <p>For questions concerning this report form, please contact the DNR at (515) 725-8351.</p>
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

*	Required Contaminant	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
		MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	6.30	mg/kg
X	Barium	2	20	<0.02	mg/L	15000	4.95	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	24.40	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
X	Chromium	0.1	1	<0.05	mg/L	210	538.00	mg/kg
						(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	537	mg/kg
						97000		
X	Cobalt					23	9.31	mg/kg
X	Copper	1.3	13	<0.02	mg/L	15000	518.00	mg/kg
X	Fluoride	4	40	0.2	mg/L	4700	59.00	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	30.40	mg/kg
X	Lithium					160	5.00	mg/kg
X	Manganese					10000	841.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	21.80	mg/kg
X	Nickel					1500	61.40	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	7.70	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	19.30	mg/kg

(*) Required contaminant
 (**) If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X		Zinc		23000		949.00		mg/kg	
Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.037	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	<0.01	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	<0.05	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
Herbicides						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400.0 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

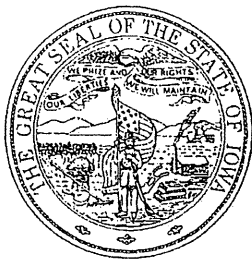
By-Product pH	
X	10.6

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Date: 8/30/23

(*) Required contaminant
Public



Beneficial Use Determination: Analytical Testing Report



DNR Certified Lab: Keystone Laboratories, Inc. Lab Report Date: 8//23 By-Product Generator: John Deere Foundry City: Waterloo, State: IA, Zip: 50701 By-Product Name: <u>West Sand Dock</u>	Send completed report form(s) and associated laboratory analytics to: Iowa Department of Natural Resources Land Quality Bureau Solid Waste Section 502 East 9th Street Des Moines, IA 50319-0034 For questions concerning this report form, please contact the DNR at (515) 725-8351.
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ANALYTICAL RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846)

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)				Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result		Regulatory Limit	Test Result	
X	Antimony	0.006	0.06	<0.01	mg/L	31	<1	mg/kg
X	Arsenic	0.01	0.1	<0.02	mg/L	17	<5	mg/kg
X	Barium	2	20	0.0831	mg/L	15000	31.50	mg/kg
X	Beryllium	0.004	0.04	<0.02	mg/L	110	<1	mg/kg
X	Boron					16000	<10	mg/kg
X	Cadmium	0.005	0.05	<0.01	mg/L	70	<1	mg/kg
X	Chromium	0.1	1	<0.05	mg/L	210	56.40	mg/kg
						(Hexavalent - VI)	<5	mg/kg
						(Trivalent - III)	56.4	mg/kg
						97000		
X	Cobalt					23	2.62	mg/kg
X	Copper	1.3	13	0.0275	mg/L	15000	93.80	mg/kg
X	Fluoride	4	40	1.4	mg/L	4700	107.00	mg/kg
X	Lead	0.015	0.15	<0.02	mg/L	400	<5	mg/kg
X	Lithium					160	<5	mg/kg
X	Manganese					10000	259.00	mg/kg
X	Mercury	0.002	0.02	<0.0005	mg/L	23	<0.05	mg/kg
X	Molybdenum					390	9.80	mg/kg
X	Nickel					1500	23.80	mg/kg
X	Selenium	0.05	0.5	<0.02	mg/L	390	3.60	mg/kg
X	Silver					370	<1	mg/kg
X	Thallium	0.002	0.02	<0.02	mg/L	0.78	<0.5	mg/kg
X	Vanadium					350	5.54	mg/kg

(*) Required contaminant

(**) If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.


Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) – Regulatory Limits

X	Zinc			23000	31.40	mg/kg			
Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
X	Arsenic	5	<0.03	mg/L		Benzene	0.5 mg/L		mg/L
X	Barium	100	0.292	mg/L		Carbon tetrachloride	0.5 mg/L		mg/L
X	Cadmium	1	<0.005	mg/L		Chlorobenzene	100.0 mg/L		mg/L
X	Chromium	5	0.073	mg/L		Chloroform	6.0 mg/L		mg/L
X	Lead	5	<0.02	mg/L		1,2-Dichloroethane	0.5 mg/L		mg/L
X	Mercury	0.2	<0.0005	mg/L		1,1-Dichloroethylene	0.7 mg/L		mg/L
X	Selenium	1	<0.05	mg/L		Methyl ethyl ketone	200.0 mg/L		mg/L
X	Silver	5	<0.01	mg/L		Tetrachloroethylene	0.7 mg/L		mg/L
						Trichloroethylene	0.5 mg/L		mg/L
						Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
	Chlordane	0.03 mg/L		mg/L		o-Cresol	200.0 mg/L		mg/L
	Endrin	0.02 mg/L		mg/L		m-Cresol	200.0 mg/L		mg/L
	Heptachlor (& its epoxide)	0.008 mg/L		mg/L		p-Cresol	200.0 mg/L		mg/L
	Lindane	0.4 mg/L		mg/L		Cresol	200.0 mg/L		mg/L
	Methoxychlor	10.0 mg/L		mg/L		1,4-Dichlorobenzene	7.5 mg/L		mg/L
	Toxaphene	0.5 mg/L		mg/L		2,4-Dinitrotoluene	0.13 mg/L		mg/L
						Hexachlorobenzene	0.13 mg/L		mg/L
						Hexachlorobutadiene	0.5 mg/L		mg/L
						Hexachloroethane	3.0 mg/L		mg/L
						Nitrobenzene	2.0 mg/L		mg/L
						Pentachlorophenol	100.0 mg/L		mg/L
	2,4-D	10.0 mg/L		mg/L		Pyridine	5.0 mg/L		mg/L
	2,4,5-TP (Silvex)	1.0 mg/L		mg/L		2,4,5-Trichlorophenol	400 mg/L		mg/L
						2,4,6-Trichlorophenol	2.0 mg/L		mg/L

By-Product pH	
X	10.2

BY-PRODUCT GENERATOR CERTIFICATION

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Signature:  Date: 8/31/23

(*) Required contaminant
Public

Printed Name: Lynette Telleen Title: Foundry Operations Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11/21/2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: 804

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2023*

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	<.772	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	0.0220 mg/L	17 mg/kg	5.59	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	<0.05 mg/L	15,000 mg/kg	161	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	0.795	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<38.6	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<.386	mg/kg
					** (Total)	18.2	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.025 mg/L	(Hexavalent - VI)		mg/kg
210 mg/kg							
(Trivalent - III)						mg/kg	
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	3.35	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.025 mg/L	15,000 mg/kg	62.3	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	3.29 mg/L	4,700 mg/kg	<18.9	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	0.00774 mg/L	400 mg/kg	25.4	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	16.1	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	185	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0196	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	3.69	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	16.9	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	1.79	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<.386	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<.386	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	10.1	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	133	mg/kg

*Required contaminant

**If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	.259	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	.104	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
Herbicides				<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L	
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

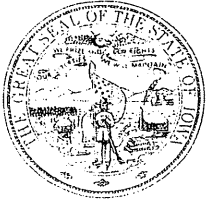
*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: _____

Printed Name: Lynette Telleen Title: Plant Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11/21/2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: Refractory

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:
 Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034
 For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	1.45	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	8.52	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	0.199 mg/L	15,000 mg/kg	35.9	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<0.386	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<38.6	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<0.386	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0250 mg/L	** (Total)	289	mg/kg
(Hexavalent - VI)					210 mg/kg	<4.75	mg/kg
(Trivalent - III)					97,000 mg/kg	289	mg/kg
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	46.9	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	0.0365 mg/L	15,000 mg/kg	3090	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	<0.2 mg/L	4,700 mg/kg	<18.5	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	0.0346 mg/L	400 mg/kg	6.08	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	<1.93	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	3800	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0167	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	35.6	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	102	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.16	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<0.386	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<0.386	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	23	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	33.8	mg/kg

*Required contaminant

**If Total Chromium ≥210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.221	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
Herbicides				<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L	
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5- Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6- Trichlorophenol	2.0 mg/L		mg/L

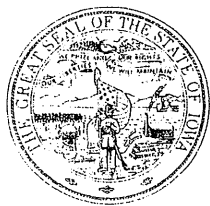
*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: _____

Printed Name: _____ Title: _____



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11-21-2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: 850

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:
 Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034
 For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals			
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result		
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	3.31	mg/kg	
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	10.5	mg/kg	
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	<0.05 mg/L	15,000 mg/kg	38.7	mg/kg	
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<0.4	mg/kg	
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<50	mg/kg	
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<0.4	mg/kg	
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.025 mg/L	** (Total)	447	mg/kg	
					(Hexavalent - VI)	210 mg/kg	<4.91	mg/kg
					(Trivalent - III)	97,000 mg/kg	447	mg/kg
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	18	mg/kg	
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.025 mg/L	15,000 mg/kg	815	mg/kg	
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	3.02 mg/L	4,700 mg/kg	<19.2	mg/kg	
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.005 mg/L	400 mg/kg	7.43	mg/kg	
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	<5.0	mg/kg	
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	2140	mg/kg	
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0185	mg/kg	
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	87.1	mg/kg	
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	215	mg/kg	
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.28	mg/kg	
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<0.58	mg/kg	
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<0.46	mg/kg	
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	23.6	mg/kg	
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	82.2	mg/kg	

*Required contaminant

**If Total Chromium ≥210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.393	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	0.0556	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

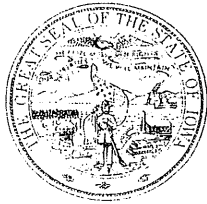
*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

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Signature: _____ **Date:** _____

Printed Name: Lynette Telleen **Title:** Plant Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11-21-2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: East Pelletizer

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:
 Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034
 For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	<1.13	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	2.71	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	<0.05 mg/L	15,000 mg/kg	63.9	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<0.564	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<56.4	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<0.564	mg/kg
					** (Total)	43.9	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0250 mg/L	(Hexavalent - VI)		mg/kg
					210 mg/kg		
					(Trivalent - III)		mg/kg
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	2.96	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0250 mg/L	15,000 mg/kg	169	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	3.53 mg/L	4,700 mg/kg	<19.8	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.005 mg/L	400 mg/kg	9.68	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	5.48	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	358	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0205	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	6.82	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	21.2	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.69	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<0.564	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<0.564	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	5.85	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	62.9	mg/kg

*Required contaminant

**If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.255	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

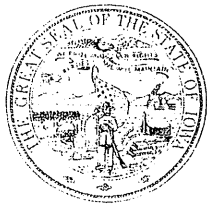
*Required contaminant

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Signature: _____ Date: _____

Printed Name: Lynette Telleen Title: Plant Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11-21-2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: 871

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

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 502 E 9th St
 Des Moines, IA 50319-0034

For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	1.76	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	8.63	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	<0.05 mg/L	15,000 mg/kg	31.8	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<.393	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<39.3	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<.393	mg/kg
					** (Total)	604	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.025 mg/L	(Hexavalent - VI)	<4.72	mg/kg
					(Trivalent - III)	604	mg/kg
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	21	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.025 mg/L	15,000 mg/kg	864	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	<1 mg/L	4,700 mg/kg	<19.3	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.005 mg/L	400 mg/kg	<7.86	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	3.05	mg/kg
<input type="checkbox"/>	Manganese				10,000 mg/kg	2530	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.016	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	91.3	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	202	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.18	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<.393	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<.393	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	22.6	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	62.3	mg/kg

*Required contaminant

**If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.469	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: _____

Printed Name: Lynette Telleen Title: Plant Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report



Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11/21/2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: West Pelletizer

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

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 Land Quality Bureau
 Solid Waste Section
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ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	<0.834	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.01 mg/L	17 mg/kg	1.64	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	0.0706 mg/L	15,000 mg/kg	43.5	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<0.417	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<41.7	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<0.417	mg/kg
					** (Total)	7.05	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0250 mg/L	(Hexavalent - VI)		mg/kg
					210 mg/kg		
					(Trivalent - III)		mg/kg
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	1.3	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	0.0606 mg/L	15,000 mg/kg	30.9	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	1.08 mg/L	4,700 mg/kg	<19.6	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	0.0136 mg/L	400 mg/kg	7.53	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	4.14	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	50.5	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0168	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	1.56	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	6.61	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.25	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<0.417	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<0.417	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	3.21	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	32.8	mg/kg

*Required contaminant

**If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.242	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: _____

Printed Name: Lynette Telleen Title: Plant Manager



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: Eurofins Cedar Falls
 Lab Report Date: 11/21/2023
 By-Product Generator: John Deere Foundry
 City: Waterloo State: IA Zip: 50701
 By-Product Name: 802

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034

For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	<0.01 mg/L	31 mg/kg	<0.885	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	0.011 mg/L	17 mg/kg	2.35	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	0.0894 mg/L	15,000 mg/kg	66.8	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.005 mg/L	110 mg/kg	<0.442	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	<44.2	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0025 mg/L	70 mg/kg	<0.442	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.025 mg/L	** (Total)	4.36	mg/kg
					(Hexavalent - VI)		mg/kg
					(Trivalent - III)		mg/kg
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	1.4	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0351 mg/L	15,000 mg/kg	23.9	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	1.77 mg/L	4,700 mg/kg	<19.9	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	0.0284 mg/L	400 mg/kg	10	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	5.5	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	64.6	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.002 mg/L	23 mg/kg	<0.0203	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	1.82	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	5.81	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.025 mg/L	390 mg/kg	<1.33	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<.442	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.005 mg/L	0.78 mg/kg	<.442	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	3.99	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	73.2	mg/kg

*Required contaminant

**If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.229	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.02	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.002	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.1	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.05	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

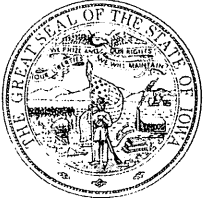
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: _____ Date: _____

Printed Name: Lynette Telleen Title: Plant Manager

UNIVERSITY OF IOWA
2023

QUARTERLY REPORTS



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: 95
 Lab Report Date: 02/16/2023
 By-Product Generator: University of Iowa Power Plant
 City: Iowa City State: IA Zip: 52242
 By-Product Name: Combined Boiler Ash

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

**Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034**

For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	0.0150 mg/L	31 mg/kg	3.15	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.0100 mg/L	17 mg/kg	6.21	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	0.336 mg/L	15,000 mg/kg	128	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.0100 mg/L	110 mg/kg	1.9	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	649	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0050 mg/L	70 mg/kg	<1.0	mg/kg
					** (Total)	41.1	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0200 mg/L	(Hexavalent - VI)	<5.0	mg/kg
					210 mg/kg		
					(Trivalent - III)	38.0	mg/kg
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	6.98	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0100 mg/L	15,000 mg/kg	29.7	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	1.1 mg/L	4,700 mg/kg	57.4	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.0100 mg/L	400 mg/kg	14.6	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	13	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	222	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	0.00362 mg/L	23 mg/kg	<0.05	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	15.2	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	20.8	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	0.0170 mg/L	390 mg/kg	7.9	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<1.0	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.0050 mg/L	0.78 mg/kg	1.4	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	63.6	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	128	mg/kg

Exceeds

*Required contaminant

**If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

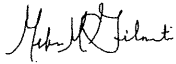
Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.030	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	0.310	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.005	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.010	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.020	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	0.0023 2	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.050	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.010	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5- Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6- Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Digitally signed by GILMARTIN MELISSA
 Date: 2023.02.17 09:31:23 -06'00' Date: 02/17/2023
 Printed Name: Melissa Gilmartin Title: Environmental Engineer

Q of I 2nd Quarter 2023

Iowa Department of Natural Resources



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report



Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: 95
 Lab Report Date: 5/18/2023
 By-Product Generator: University of Iowa Power Plant
 City: Iowa City State: IA Zip: 52242
 By-Product Name: Combined Boiler Ash

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

**Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034**

For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	0.0210 mg/L	31 mg/kg	20.8	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.0100 mg/L	17 mg/kg	9.16	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	0.276 mg/L	15,000 mg/kg	774	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.0100 mg/L	110 mg/kg	1.1	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	254	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0050 mg/L	70 mg/kg	1.1	mg/kg
					** (Total)	30.2	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0200 mg/L	(Hexavalent - VI)	<5.0	mg/kg
210 mg/kg							
(Trivalent - III)					30.2	mg/kg	
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	7.32	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0100 mg/L	15,000 mg/kg	115	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	0.8 mg/L	4,700 mg/kg	39.4	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.0100 mg/L	400 mg/kg	12.0	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	15	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	167	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	0.00250 mg/L	23 mg/kg	<0.05	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	35.7	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	13.9	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	0.0211 mg/L	390 mg/kg	10.0	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	1.7	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.0050 mg/L	0.78 mg/kg	1.3	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	85.1	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	247	mg/kg

*Exceeds
(OK)*

*Required contaminant

**If Total Chromium ≥ 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.


Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals					Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.030	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	1.28	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.005	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.010	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.020	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	0.00148	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.050	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.010	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides					Semi-Volatile Organic Compounds				
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
					<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature:  Digitally signed by GILMARTIN MELISSA
 Date: 2023.05.18 11:11:03 -05'00' Date: 5/18/2023
 Printed Name: Melissa Gilmartin Title: Environmental Engineer

Uof I 3rd Quarter 2023

Beneficial Use ID# 07 -BUD- 20 -02

IOWA DEPARTMENT OF NATURAL RESOURCES



Beneficial Use Determination:
Solid By-Product Management Plan

Analytical Testing Report

DNR Certified Lab: 95
 Lab Report Date: 95
 By-Product Generator: Univerisity of Iowa Power Plant
 City: Iowa City State: IA Zip: 52242
 By-Product Name: Combined Boiler Ash

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

 Iowa Department of Natural Resources
 Land Quality Bureau
 Solid Waste Section
 502 E 9th St
 Des Moines, IA 50319-0034

 For questions concerning this report form please contact the DNR at (515) 725-8351.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

*	Required Contaminant	Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals	
		MCL	10 X MCL	Test Result	Regulatory Limit	Test Result
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	0.0115 mg/L	31 mg/kg	15.8 mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.0100 mg/L	17 mg/kg	12.0 mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	12.3 mg/L	15,000 mg/kg	1600 mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.0100 mg/L	110 mg/kg	<1.0 mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	229 mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0050 mg/L	70 mg/kg	<4.0 mg/kg
					** (Total)	33.0 mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0200 mg/L	(Hexavalent - VI)	mg/kg
					210 mg/kg	
					(Trivalent - III)	33.0 mg/kg
					97,000 mg/kg	
<input checked="" type="checkbox"/>	Cobalt				31 mg/kg	11.5 mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0100 mg/L	15,000 mg/kg	147 mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	1.0 mg/L	4,700 mg/kg	69.3 mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.0100 mg/L	400 mg/kg	<20.0 mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	26 mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	167 mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.00050 mg/L	23 mg/kg	<0.05 mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	9.3 mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	<20.0 mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.0100 mg/L	390 mg/kg	14.6 mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<4.0 mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.0050 mg/L	0.78 mg/kg	<0.5 mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	30.7 mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	165 mg/kg

*Required contaminant

**If Total Chromium ≥210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.030 mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L	mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	11.2 mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L	mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.005 mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L	mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	<0.010 mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L	mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	0.027 mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L	mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.00050 mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L	mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.050 mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L	mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.010 mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L	mg/L
				<input type="checkbox"/>	Trichloroethylene	0.5 mg/L	mg/L
				<input type="checkbox"/>	Vinyl chloride	0.2 mg/L	mg/L
Pesticides				Semi-Volatile Organic Compounds			
*	Contaminant	Regulatory Limit	Test Result	*	Contaminant	Regulatory Limit	Test Result
<input type="checkbox"/>	Chlordane	0.03 mg/L	mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L	mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L	mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L	mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L	mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L	mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L	mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L	mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L	mg/L
				<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L	mg/L
				<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L	mg/L
				<input type="checkbox"/>	Hexachloroethane	3.0 mg/L	mg/L
				<input type="checkbox"/>	Nitrobenzene	2.0 mg/L	mg/L
Herbicides				<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L	mg/L
*	Contaminant	Regulatory Limit	Test Result	<input type="checkbox"/>	Pyridine	5.0 mg/L	mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L	mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L	mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L	mg/L	<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L	mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: Mark Maxwell Date: 10/06/2023
 Printed Name: Mark Maxwell Title: Environmental Engineer



Beneficial Use Determination: Solid By-Product Management Plan Analytical Testing Report

Beneficial Use ID#: 07 -BUD- 20 - 02
 DNR Certified Lab: 95
 Lab Report Date: 11/27/2023
 By-Product Generator: University of Iowa Power Plant
 City: Iowa City State: IA Zip: 52242
 By-Product Name: Combined Boiler Ash

Send completed report form(s), laboratory analytics, and supplemental Solid By-Product Management Plan (SBMP) documentation to:

**Iowa Department of Natural Resources
Land Quality Bureau
Solid Waste Section
502 E 9th St
Des Moines, IA 50319-0034**

For questions concerning this report form please contact the DNR at (515) 201-8272.

ANALYTICAL TESTING RESULTS

Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

Required		Synthetic Precipitation Leaching Procedure (EPA Test Method 1312)			Total Metals		
*	Contaminant	MCL	10 X MCL	Test Result	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Antimony	0.006 mg/L	0.06 mg/L	0.0296 mg/L	31 mg/kg	42.0	mg/kg
<input checked="" type="checkbox"/>	Arsenic	0.010 mg/L	0.10 mg/L	<0.0100 mg/L	17 mg/kg	2.06	mg/kg
<input checked="" type="checkbox"/>	Barium	2.0 mg/L	20.0 mg/L	2.85 mg/L	15,000 mg/kg	868	mg/kg
<input checked="" type="checkbox"/>	Beryllium	0.004 mg/L	0.04 mg/L	<0.0100 mg/L	110 mg/kg	<1.0	mg/kg
<input checked="" type="checkbox"/>	Boron				16,000 mg/kg	171	mg/kg
<input checked="" type="checkbox"/>	Cadmium	0.005 mg/L	0.05 mg/L	<0.0050 mg/L	70 mg/kg	<1.0	mg/kg
					** (Total)	21.7	mg/kg
<input checked="" type="checkbox"/>	Chromium	0.1 mg/L	1.0 mg/L	<0.0200 mg/L	(Hexavalent - VI)	<5.0	mg/kg
					210 mg/kg		
					(Trivalent - III)	21.7	mg/kg
					97,000 mg/kg		
<input checked="" type="checkbox"/>	Cobalt				23 mg/kg	4.86	mg/kg
<input checked="" type="checkbox"/>	Copper	1.3 mg/L	13.0 mg/L	<0.0100 mg/L	15,000 mg/kg	87.4	mg/kg
<input checked="" type="checkbox"/>	Fluoride	4.0 mg/L	40.0 mg/L	0.8 mg/L	4,700 mg/kg	25.1	mg/kg
<input checked="" type="checkbox"/>	Lead	0.015 mg/L	0.15 mg/L	<0.0100 mg/L	400 mg/kg	9.26	mg/kg
<input checked="" type="checkbox"/>	Lithium				160 mg/kg	11	mg/kg
<input checked="" type="checkbox"/>	Manganese				10,000 mg/kg	238	mg/kg
<input checked="" type="checkbox"/>	Mercury	0.002 mg/L	0.02 mg/L	<0.00050 mg/L	23 mg/kg	<0.05	mg/kg
<input checked="" type="checkbox"/>	Molybdenum				390 mg/kg	6.4	mg/kg
<input checked="" type="checkbox"/>	Nickel				1,500 mg/kg	12.3	mg/kg
<input checked="" type="checkbox"/>	Selenium	0.05 mg/L	0.5 mg/L	<0.0100 mg/L	390 mg/kg	6.9	mg/kg
<input checked="" type="checkbox"/>	Silver				370 mg/kg	<1.0	mg/kg
<input checked="" type="checkbox"/>	Thallium	0.002 mg/L	0.02 mg/L	<0.0050 mg/L	0.78 mg/kg	<0.5	mg/kg
<input checked="" type="checkbox"/>	Vanadium				350 mg/kg	17.4	mg/kg
<input checked="" type="checkbox"/>	Zinc				23,000 mg/kg	232	mg/kg

*Required contaminant

**If Total Chromium \geq 210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Toxicity Characteristic Leaching Procedure (EPA Test Method 1311) - Regulatory Limits

Metals				Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input checked="" type="checkbox"/>	Arsenic	5.0 mg/L	<0.030	mg/L	<input type="checkbox"/>	Benzene	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Barium	100.0 mg/L	1.77	mg/L	<input type="checkbox"/>	Carbon tetrachloride	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Cadmium	1.0 mg/L	<0.005	mg/L	<input type="checkbox"/>	Chlorobenzene	100.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Chromium	5.0 mg/L	0.015	mg/L	<input type="checkbox"/>	Chloroform	6.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Lead	5.0 mg/L	<0.020	mg/L	<input type="checkbox"/>	1,2-Dichloroethane	0.5 mg/L		mg/L
<input checked="" type="checkbox"/>	Mercury	0.2 mg/L	<0.00050	mg/L	<input type="checkbox"/>	1,1-Dichloroethylene	0.7 mg/L		mg/L
<input checked="" type="checkbox"/>	Selenium	1.0 mg/L	<0.050	mg/L	<input type="checkbox"/>	Methyl ethyl ketone	200.0 mg/L		mg/L
<input checked="" type="checkbox"/>	Silver	5.0 mg/L	<0.010	mg/L	<input type="checkbox"/>	Tetrachloroethylene	0.7 mg/L		mg/L
					<input type="checkbox"/>	Trichloroethylene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Vinyl chloride	0.2 mg/L		mg/L
Pesticides				Semi-Volatile Organic Compounds					
*	Contaminant	Regulatory Limit	Test Result		*	Contaminant	Regulatory Limit	Test Result	
<input type="checkbox"/>	Chlordane	0.03 mg/L		mg/L	<input type="checkbox"/>	o-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Endrin	0.02 mg/L		mg/L	<input type="checkbox"/>	m-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Heptachlor (and its epoxide)	0.008 mg/L		mg/L	<input type="checkbox"/>	p-Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Lindane	0.4 mg/L		mg/L	<input type="checkbox"/>	Cresol	200.0 mg/L		mg/L
<input type="checkbox"/>	Methoxychlor	10.0 mg/L		mg/L	<input type="checkbox"/>	1,4-Dichlorobenzene	7.5 mg/L		mg/L
<input type="checkbox"/>	Toxaphene	0.5 mg/L		mg/L	<input type="checkbox"/>	2,4-Dinitrotoluene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobenzene	0.13 mg/L		mg/L
					<input type="checkbox"/>	Hexachlorobutadiene	0.5 mg/L		mg/L
					<input type="checkbox"/>	Hexachloroethane	3.0 mg/L		mg/L
Herbicides					<input type="checkbox"/>	Nitrobenzene	2.0 mg/L		mg/L
*	Contaminant	Regulatory Limit	Test Result		<input type="checkbox"/>	Pentachlorophenol	100.0 mg/L		mg/L
<input type="checkbox"/>	2,4-D	10.0 mg/L		mg/L	<input type="checkbox"/>	Pyridine	5.0 mg/L		mg/L
<input type="checkbox"/>	2,4,5-TP (Silvex)	1.0 mg/L		mg/L	<input type="checkbox"/>	2,4,5-Trichlorophenol	400.0 mg/L		mg/L
					<input type="checkbox"/>	2,4,6-Trichlorophenol	2.0 mg/L		mg/L

*Required contaminant

BY-PRODUCT GENERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature: GILMARTIN MELISSA Digitally signed by GILMARTIN MELISSA
 Date: 2023.11.28 10:24:51 -06'00' **Date:** 11/28/2023

Printed Name: Melissa Gilmartin Title: Environmental Engineer

Section 2: Exceedances and Risk Calculator Results.

Any “Exceedances” in the Test Results from the By Product Generator products were either hilted by the By Product Generators or uncovered by BMC at the time of submission of the test results to the End-User. Any such concerns were also immediately reported to the IDNR by either the By Product Generator or BMC Aggregates. If an exceedance in the acceptable or thresh-hold values for any contaminant in the material did occur, the Risk Calculator computation was utilized by the By Product Generator to determine if the product could continue to be brought to the BMC, BUD Location. For this reporting year March 1, 2023, through February 2024, only one calculated value exceeded the concentrations detected in the Lab Results from either Product Generators, which also exceeded the Risk Calculator permitted values. As a result, that one product has been discontinued for acceptance until further testing. The remaining products from the Product Generators were permitted by IDNR to continue to be brought to the End-User (BMC Aggregates) for placement at the BUD location (South Quarry).

An example of Exceedance reporting is attached to this section.

Note: For any product deemed unacceptable after the Risk Calculator was used, the By Product Generator would have needed to change the conditions or procedures for use of the parent material and then resampled the end product from the material to determine if either the threshold values could be reduced or if the use changes would result in a favorable recalculation through the Risk Calculator to resume placement at the BUD location.

For the exceedances which were reported to IDNR by the By Product Generator, the computed Risk Calculator Values for determination of placement of the material at the BUD location (South Quarry) were submitted to IDNR. In all but one instance, the Risk Calculator values were below the threshold of concern and the Product Generators were able to continue bringing the materials to the site for placement.



USI First Quarter
2023

Thallium
Exceedance
No issue → Risk Factor
(ES)

VIA ELECTRONIC MAIL

Chad Stobbe
Iowa Department of Natural Resources
Chad.Stobbe@dnr.iowa.gov

February 17, 2023

RE: Notification of Thallium Exceedance in Boiler Ash Sample, University of Iowa Power Plant

Dear Mr. Stobbe:

As required in Special Condition 6) a. of Beneficial Use Determination 07-BUD-20-02, UI is required to submit a written notification within 10 business days for any results that exceed regulatory limits.

A composite sample of the power plant's combined boiler ash was collected over the period from 01/03/2023 through 01/17/2023, and delivered to the Keystone Laboratories in Newton, IA. The results from the testing show thallium exceeded the total Metals regulatory limit of 0.78 mg/kg for the composite sample. The tested thallium value was 1.4 mg/kg.

The analytical results were entered in the Iowa Department of Natural Resources Cumulative Risk Calculator, and the resultant values are below 1.0 for Site Worker. The analytical reports and risk calculations have been enclosed for your review.

Please contact me at 319-800-2052, or melissa.gilmartin@engie.com with any questions regarding this report.

Sincerely,

Digitally signed by GILMARTIN
MELISSA
Date: 2023.02.17 09:30:47 -06'00'

Melissa M. Gilmartin
Environmental Engineer

Enclosures:

- KeystoneAshResults_2023Q1.pdf
- Cumulative_Risk_Results_2023Q1.xlsx
- BeneficialUseDetermination_AnalyticalTestingReport_2023Q1.pdf

CC:

- BMC Aggregates, L.C., Sherman Lundy, sherml@bmcaggregates.com
- ENGIE, Mark Maxwell, mark.maxwell@engie.com
- University of Iowa, Jenna Wischmeyer, jenna-wischmeyer@uiowa.edu



JOHN DEERE

John Deere Foundry
2000 Westfield Ave.
E-mail: wirtjeskathrynj@JohnDeere.com

Kate Wirtjes
Environmental Engineer

February 1, 2023

Chad Stobbe
Environmental Specialist Senior
502 East 9th Street
Des Moines, IA 50319
USA

Subject: Notification of Lead Exceedance in Refractory Brick

Mr. Stobbe,

As required in Special Condition 6) a. of Beneficial Use Determination 07-BUD-20-02, John Deere Foundry is required to submit a written notification within 10 business days for any results that exceed regulatory limits.

Q1 2023 sample results for Refractory Brick exceeded the Total Metals regulatory limit for Lead. Results were received by the facility on January 26, 2023. Results were 541 mg/kg, compared to a limit of 400 mg/kg. Special Condition 6) a. of Beneficial Use Determination 07-BUD-20-02 allows for exception of exceedances of RCRA total metals that do not present an unacceptable risk level as determined by the Iowa Cumulative Risk Calculator using the "Site Worker" exposure scenario.

The Iowa Cumulative Risk Calculator was completed for Refractory Brick, and the resultant values did not exceed the unacceptable level of 1.0 for Site Worker for the Cumulative Cancer risk and Output by Target Organ. The risk calculation has been enclosed for your review. Additionally, the signed sample results form and laboratory analytical is enclosed.

Sincerely,

Kate Wirtjes
Environmental Engineer

Enclosures:

Refractory Brick analytical results form
Keystone Lab report for all Quarterly Sampling
Cumulative Risk Calculation Refractory Brick

Section 3: End-User Monitoring Reports.

a. End-User groundwater monitoring involved securing water samples from 4 monitoring wells on site and one upgradient well, sending these samples to Keystone Labs for testing, then forwarding these results to SCS Engineers for review and comments. A copy of the biannual test results from the 5 monitoring wells as analyzed by Keystone Labs accompanies this Section of the Report in addition to the Analytical and Statistical review of the results by SCS. Any exceedances above the accepted thresholds were to be reported to DNR. In the case of the VOCs and SVOCs testing was to be completed only for any VOCs or SVOCs present in the By Product Generator materials and to establish a base line for future reference.

b. The 2023 Monitoring Well Testing program followed the original testing of several heavy metallic ions along with some additional nonmetallic ions and later for the VOCs found in the By Product Generator Materials. These tests, originally involved the SPLP Testing as outlined in the DNR Analytical Testing Report. The Monitoring Well Testing Program for 2023 utilized the total testing requirements as outlined in Appendix D of the newer BUD Permit, 07-BUD-20-02 along with the possible presence of VOCs as noted in the test results from the By Product Generator results from the fall of 2018. SCS also pointed out the need to utilize the full spectrum of testing requirements as noted in Appendix D.

c. The Complete 2023 Annual Water Quality Report for BMC Aggregates as generated by SCS Engineering Consultants is part of this Section. Again, all of the Keystone information from the BMC field testing is included in this report along with detailed Statistical Analysis of the material. The total metal results in the Monitoring Wells did not exceed any threshold of concern. The presence of common metallic ions such as iron and magnesium should be expected in groundwater drawn from limestone aquifers which commonly contain these ions. Earlier presence

of VOCs in the previous March 2021 testing results was limited to only one of the monitoring wells. For 2023, the only detectable VOC was a minimal occurrence of “phenols [0.06 ppm]” in 2 of the monitoring wells test results in March and October of 2023

**SCS ENGINEERS
ENVIRONMENTAL CONSULTANTS
STATISTICAL ANALYSIS
AND
SUMMARY REPORT
FOR YEAR 2023
[BMC AGGREGATES
MONITORING WELLS]**

February 21, 2024

Mr. Chad Stobbe
Iowa Department of Natural Resources
Land Quality Bureau
Wallace State Office Building
502 East 9th Street
Des Moines, Iowa 50319

Subject: 2023 Annual Water Quality Report
BMC Aggregates L.C. Waterloo South Quarry
Beneficial Use Site
Permit No. 07-BUD-20-02

Dear Chad:

SCS Engineers, on behalf of BMC Aggregates, L.C., has completed the statistical analyses and annual water quality reporting for the BMC Aggregates L.C. Waterloo South Quarry Beneficial Use Site for the year 2023. Groundwater sampling was performed by BMC Aggregates L.C. personnel. Please find enclosed a copy of the 2023 Annual Water Quality Report and associated statistical evaluation.

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

Sincerely,

Nathan Ohrt
Senior Project Professional
SCS Engineers

Timothy C. Buelow, P.E.
Project Director
SCS Engineers

NPO/TCB

Copies: Mr. Sherman Lundy, BMC Aggregates, L.C.



**2023 ANNUAL WATER QUALITY REPORT
BMC WATERLOO SOUTH QUARRY
BENEFICIAL USE SITE
LA PORTE CITY, IOWA**

PERMIT #07-BUD-20-02

**PROJECT No. 2723265.00
FEBRUARY 2024**

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APPENDIX D	2023 STATISTICAL REPORT
APPENDIX E	MANN-KENDALL OUTPUT ($\alpha=0.20$)

Section 1.0 Introduction

1.1 Purpose

SCS Engineers (SCS), on behalf of BMC Aggregates, L.C., has completed the statistical evaluation of the groundwater data for the Waterloo South Quarry Beneficial Use site (South Quarry). BMC Aggregates, L.C. personnel performed the groundwater sampling. The purpose of this Annual Water Quality Report (AWQR) is to document and statistically evaluate the results for groundwater samples collected during 2023 from monitoring wells associated with the South Quarry.

1.2 Site Location

The South Quarry property is depicted in Figure 1-1, Site Map. The facility is located near the intersection of State Highway V37 (Dysart Road) and East Eagle Road near La Porte City in Black Hawk County, Iowa. The locations of the monitoring wells are shown in Figure 1-2, Monitoring Point Locations.

1.3 Background

The *Beneficial Use Determination (BUD)* dated November 18, 2022 (Doc #104627) states that the materials approved for fill are waste foundry sand generated by the John Deere foundry in Waterloo, Iowa and coal combustion residue (CCR) generated by the University of Iowa power plant in Iowa City, Iowa.

1.4 Monitoring Program

The reporting period for this AWQR is from January through December 2023 and includes the March and October 2023 sampling events. The field sampling data and laboratory analytical data sheets for the 2023 sampling events are included in Appendices A and B, respectively. The Summary of Groundwater Chemistry is included in Appendix C.

Table 1-1 summarizes the monitoring points and sampling conducted during this reporting period.

**Table 1-1
2023 AWQR Reporting Period Monitoring Summary**

Monitoring Wells	March 2023	October 2023
Reiter Farm (b)	Indicators, Inorganics, and Organics	Indicators, Inorganics, and Organics
Well #1	Indicators, Inorganics, and Organics	Indicators, Inorganics, and Organics
Well #2	Indicators, Inorganics, and Organics	Indicators, Inorganics, and Organics
Well #3	Indicators, Inorganics, and Organics	Indicators, Inorganics, and Organics
Well #4	Indicators, Inorganics, and Organics	Indicators, Inorganics, and Organics

(b) denotes background monitoring well.
See Table 1-2 for list of parameters.

Table 1-2 shows the parameters that comprise the sampling list for the South Quarry as required by the permit.

**Table 1-2
Permit Parameters**

Indicator Parameters:	
Chemical Oxygen Demand	Total Organic Halogens
Phenols	Ammonia Nitrogen
Formaldehyde	Total Dissolved Solids
Inorganic Parameters:	
Aluminum	Lead
Antimony	Magnesium
Arsenic	Manganese
Barium	Mercury
Beryllium	Molybdenum
Boron	Nickel
Cadmium	Selenium
Chloride	Silver
Chromium	Sulfate
Cobalt	Thallium
Copper	Vanadium
Fluoride	Zinc
Iron	Total Suspended Solids
Organic Parameters Detected in Background TCLP:	
Benzene	2-Methylphenol
Chloroform	3/4-Methylphenol
2-Butanone (MEK)	Pyridine

The permit specifies the indicator and inorganic parameters that are to be analyzed during the semi-annual sampling events. Volatile organic compounds (VOCs) and/or semi-volatile organic compounds (SVOCs) detected above the laboratory method detection limit in the approved fill materials are to be analyzed during the semi-annual sampling events. The organic parameters for this reporting period are summarized in Table 1-2.

The groundwater monitoring statistical methods used for the South Quarry were outlier analysis, trend analysis (Mann-Kendall/Sen's Slope), and a confidence interval or confidence band evaluation, as appropriate, for the identification of exceedances of a groundwater protection standard (GWPS) at a statistically significant level (SSL). The results of the 2023 evaluation are included in Appendix D (2023 Statistical Report) and discussed in Section 3.0.

1.5 Field Procedures

BMC Aggregates, L.C. personnel performed the groundwater sampling on March 14 and October 18, 2023. Static water level measurements were obtained utilizing an electronic water level indicator. Samples were collected with bailers with purging of approximately one bailer volume prior to sampling. Temperature and pH measurements were collected in the field with a thermometer and pH probe. Summaries of the field data from the March and October 2023 sampling events are included in Appendix A.

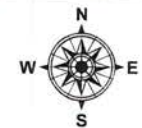


Site Map

Legend

 Approximate Property Boundary

BMC Aggregates
 South Quarry
 La Porte City, Iowa
 Project No: 27223265.00
 Drawing Date: January 2024





0 445 890 1,780 2,670
 Feet

Figure 1-1



Monitoring Point Locations

Legend

-  Approximate Location of Groundwater Monitoring Well
-  Approximate Property Boundary

BMC Aggregates
 South Quarry
 La Porte City, Iowa
 Project No: 27223265.00
 Drawing Date: January 2024

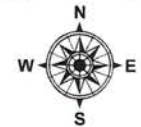


Figure 1-2

Section 2.0 Hydrogeologic Site Summary

The *Groundwater Monitoring Plan*, dated August 2010, prepared by Robinson Engineering Company described the geology and hydrogeology of the South Quarry as follows.

2.1 Geology

The geology of the area is represented in the open pit area by the Coralville Formation [immediately beneath the overburden (topsoil)] as the former resource ledge of the quarry with the floor in the Little Cedar Formation. The floor interval, formerly known as the Rapid Member of the old Cedar Valley Formation (now part of the Little Cedar Formation), separates the Coralville Formation in the open pit area from the Solon Member of the now abandoned, water filled underground mine.

2.2 Hydrogeology

In terms of the hydrogeology, Miller Creek, which flows to the northeast and is a minor tributary of the Cedar River, is 1300' north of this beneficial fill and reclamation location. The Cedar River is 4 miles east northeast from this site and all surface waters move towards the east or northeast of the South Quarry. Groundwater movement tends to follow this trend moving to the east and slightly northeast of this site. The proposed placement of the monitoring wells reflects this groundwater and surface water trend.

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Section 3.0 Data Evaluation, Summary, and Recommendations

3.1 Data Evaluation

Statistical evaluation was conducted for the inorganic constituents numbered 1 - 25 in Appendix D of the BUD permit (Doc #104627). The results of the statistical evaluation for the groundwater analytical data collected during the March and October 2023 sampling events is located in Appendix D (2023 Statistical Report) of this report. Table 3-1 contains a summary of constituent detections by monitoring point for the reporting period. Following the table are discussions of the analytical data for the monitoring program.

**Table 3-1
Constituent Detection Summary**

Constituent	Reiter Farm (b)	Well #1	Well #2	Well #3	Well #4
Aluminum	ND	3	ND	3	3,10
Antimony	ND	ND	ND	ND	ND
Arsenic	3	3	3	3	3,10
Barium	3,10	3,10	3,10	3,10	3,10
Beryllium	ND	ND	ND	ND	ND
Boron	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND
Chloride	3,10	3,10	3,10	3,10	3,10
Chromium	ND	ND	ND	3	3,10
Cobalt	ND	ND	ND	ND	ND
Copper	3,10	3,10	3,10	3,10	3,10
Fluoride	3,10	3,10	3,10	3,10	3,10
Iron	ND	3,10	3,10	3	3,10
Lead	3	3	ND	3	3,10
Magnesium	3,10	3,10	3,10	3,10	3,10
Manganese	ND	3,10	3,10	3,10	3,10
Mercury	ND	ND	ND	ND	ND
Molybdenum	3,10	ND	ND	3,10	3,10
Nickel	ND	3	ND	3	3,10
Selenium	ND	ND	ND	3	ND
Silver	ND	ND	ND	ND	ND
Sulfate	3,10	3,10	3,10	3,10	3,10
Thallium	ND	3	ND	ND	ND
Vanadium	ND	ND	ND	3	10
Zinc	3,10	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
2-Butanone (MEK)	ND	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND	ND

Constituent	Reiter Farm (b)	Well #1	Well #2	Well #3	Well #4
3/4-Methylphenol	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
Pyridine	ND	ND	ND	ND	ND

(b) denotes background monitoring well.

ND - Not Detected.

3 - March 2023

10 - October 2023

J flag concentrations, which are estimated concentrations greater than the method detection limit but below the laboratory reporting limit, were not considered detections for Table 3-1.

Table 3-1 shows that the majority of parameters were fairly consistently detected within individual monitoring wells: either detected during both sampling events or not detected during this reporting period. However, there were more single detections during the March 2023 sampling event compared to the October 2023 sampling event. No VOCs or SVOCs were detected during this reporting period.

3.2 Summary of Analytical Data

The range of concentrations measured during this reporting period is shown in Figure 3-1 (Reporting Period Detection Summary). The background Reiter Farm monitoring well is sampled for the calculation of site background concentrations but is not statistically evaluated. Mann-Kendall trend analysis and confidence intervals were the selected statistical evaluation performed for the constituents numbered 1 - 25 in Appendix D of the BUD permit (Doc #104627). The indicator parameters listed in Appendix D of the permit are not statistically evaluated. Indicator parameter analytical data are included on the last page of Appendix C, Summary of Groundwater Chemistry.

VOCs and SVOCs were not detected in the monitoring well network during this reporting period. Well #1 had four site-wide maximum concentrations, Wells #2 and #3 had two each, the Reiter Farm well had five, and Well #4 had seven site-wide maximum concentrations.

Groundwater protection standards and their sources for the inorganic parameters are included in Table 3-2. The GWPSs in Table 3-2 were first proposed in correspondence dated May 4, 2020 (Doc #97649).

**Table 3-2
Source of GWPS**

Constituent	GWPS (mg/L)	Source of GWPS
Aluminum	0.2	SMCL
Antimony	0.006	MCL
Arsenic	0.01	MCL
Barium	2	MCL
Beryllium	0.004	MCL
Boron	6	SWS
Cadmium	0.005	MCL
Chloride	250	SMCL
Chromium	0.1	MCL
Cobalt	0.0021	SWS
Copper	1.3	MCL
Fluoride	2.0	SMCL
Iron	0.3	SMCL
Lead	0.015	MCL
Magnesium	26	SS GWPS
Manganese	0.05	SMCL

Constituent	GWPS (mg/L)	Source of GWPS
Mercury	0.002	MCL
Molybdenum	0.04	SWS
Nickel	0.1	SWS
Selenium	0.05	MCL
Silver	0.1	SMCL
Sulfate	250	SMCL
Thallium	0.002	MCL
Vanadium	0.035	SWS
Zinc	2	SWS

MCL – Maximum Contaminant Level

SMCL – Secondary Maximum Contaminant Level

SWS – Iowa Statewide Standard

SS GWPS – Site-Specific Groundwater Protection Standard

3.3 Summary of Statistics

Table 3-3 summarizes the monitoring points and SSLs measured during this reporting period.

Table 3-3
2023 Statistical Summary Table

Monitoring Well	2023 SSL – Parameters
Well #1	Magnesium
Well #2	Magnesium
Well #3	Magnesium
Well #4	None

Magnesium has no health-based regulatory standards. The GWPS for magnesium used in this report was based on the background concentration of the background Reiter Farm water supply well. The Reiter Farm water supply well differs from the groundwater monitoring wells in construction, use, and screened interval, which may contribute to the constituent concentration differences.

Magnesium is prevalent in Iowa geology, including at the South Quarry. The Geological Society of Iowa publication "Geology and Reclamation at the Waterloo South Quarry, Black Hawk County, Iowa (Guidebook 94, April 22, 2017) describes the surficial geology, Devonian stratigraphy, and mineralogy of the quarry in addition to the beneficial fill/quarry reclamation project that is the basis for this water monitoring project.

The measured 2023 magnesium concentrations in monitoring wells #1, #2, and #3 were reviewed. Recent measured magnesium concentrations in each of the compliance monitoring wells are generally lower than those measured in the pre-2015 time period, indicating apparent improving groundwater quality. The reclamation project previously accepted CCR from the Iowa State University and University of Northern Iowa power plants, but those sources have ceased in recent years, with the fill consisting of waste foundry sand from John Deere in Waterloo and CCR from the University of Iowa power plant. It is unclear what effect that change may have had or will have, if any, on measured concentrations.

Mann-Kendall trend analysis was performed at 99% confidence ($\alpha=0.01$) using the most recent eight samples. The evaluation indicated a statistically significant decreasing trend for iron and a

statistically significant increasing trend for sulfate, both in Well #1. A summary of the Mann-Kendall results for the SSL constituent-monitoring point pairs is shown in Table 3-4.

Table 3-4
Trending for SSL Well/Constituent Pairs

Monitoring Well	Constituent	Mann-Kendall Statistic	Trend
Well #1	Magnesium	-9	Decreasing
Well #2	Magnesium	16	Increasing
Well #3	Magnesium	-2	Decreasing

The magnesium concentration trends in Wells #1 and #3 are decreasing and increasing in Well #2. A Mann-Kendall statistic of -21 would be considered a statistically significant decreasing trend at 99% confidence while a statistic of 21 would be considered a statistically significant increasing trend. A Mann-Kendall/Sen's Slope trend test summary table and graphs and time series plots are included in Appendix D, 2023 Statistical Report.

Although not necessarily statistically significant, Mann-Kendall statistics can provide an indication of general trending in the data. Trend indications for the downgradient monitoring wells are shown in Table 3-5. The statistics used to develop the general trending differ from the Mann-Kendall statistics used in the diagnostics section of the statistical report in that a much lower trend threshold is applied for the general trending information ($\alpha=0.20$ versus $\alpha=0.01$). Trends classified as decreasing or increasing exhibited a statistically significant trend with 80% confidence using the most recent eight data points. Trends classified as stable did not exhibit a statistically significant trend with 80% confidence using the eight most recent data points. A summary of Mann-Kendall statistics by constituent in each monitoring point is included in Appendix E, Mann-Kendall Output ($\alpha=0.20$).

Table 3-5
Mann-Kendall Summary Table

Trending in Monitoring Wells				
Monitoring Well	Decreasing Trends	Stable Trends	Increasing Trends	Number of Constituents Analyzed
Well #1	13.33%	66.67%	20.00%	15
Well #2	11.76%	82.35%	5.88%	17
Well #3	4.76%	95.24%	0.00%	21
Well #4	0.00%	94.44%	5.56%	18
Site-Wide	7.04%	85.92%	7.04%	71

Review of the Mann-Kendall statistics indicated that approximately 93% of the Mann-Kendall statistics following the 2023 statistical evaluation were considered stable or declining. The constituents with increasing trends are discussed in Table 3-6.

**Table 3-6
Increasing Trends**

Monitoring Well	Constituent	Comments
Well #1	Chloride	The concentrations measured in 2023 are higher than some previous measurements but are the lowest concentrations measured at the South Quarry.
	Phenols	Phenols were not detected before the October 2022 sampling event, so the low quantified detections in 2023 indicated an increasing trend.
	Sulfate	Sulfate does have some recent elevated concentrations, but sulfate concentrations in Well #1 are the lowest observed at the site.
Well #2	Magnesium	The increasing trend is likely due to the concentration of 40.1 mg/L measured during the October 2023 sampling event, which is the highest in the most recent eleven samples.
Well #4	Lead	Lead was not detected in Well #4 since March 2019 before the March 2023 sampling event, so the low quantified detections in 2023 indicated an increasing trend.

3.4 QA/QC Information

The QA/QC protocols for the March and October 2023 sampling events included laboratory protocols provided by Keystone Laboratories, Inc.; documentation is included in Appendix B (Laboratory Analytical Data Sheets).

3.5 Recommendations

Review of the data indicated the beneficial use project is not having a significant adverse effect on the groundwater at the South Quarry as represented by groundwater samples collected from the monitoring wells associated with the South Quarry. Based on the groundwater sampling analytical results and the statistical evaluation performed on the data, the following is recommended:

- Continue sampling the Reiter Farm monitoring well and monitoring wells Well #1, Well #2, Well #3, and Well #4 for the permit parameters on a semi-annual schedule.

The recommended sampling schedule for the upcoming reporting period (January through December 2024) is summarized in Table 3-7.

**Table 3-7
2024 AWQR Reporting Period Sampling Schedule**

Monitoring Point	March 2024	October 2024
Reiter Farm	Permit Parameters	Permit Parameters
Well #1	Permit Parameters	Permit Parameters
Well #2	Permit Parameters	Permit Parameters
Well #3	Permit Parameters	Permit Parameters
Well #4	Permit Parameters	Permit Parameters

See Table 1-2 for list of current permit parameters. Required organic parameters will be determined by testing performed by the fill material generators.

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Well #1	
Constituent (units)	Concentration
Aluminum (mg/L)	0.541 (1/2)
Fluoride (mg/L)	0.9 - 0.8 (1/2)
Molybdenum (mg/L)	0.0028 - 0.004 (1/2)
Arsenic (mg/L)	0.0038 (1/2)
Barium (mg/L)	0.0957 - 0.58 (1/2)
Chromium (mg/L)	0.0033 (1/2)
Copper (mg/L)	0.0015 - 0.0043 (1/2)
Lead (mg/L)	0.0011 (1/2)
Nickel (mg/L)	0.0046 (1/2)
Selenium (mg/L)	0.0006 (1/2)
Vanadium (mg/L)	0.0008 (1/2)
Phenols, total (mg/L)	0.043 (1/2)
Iron (mg/L)	0.441 (1/2)
Manganese (mg/L)	0.0077 - 0.0294 (1/2)
Sulfate (mg/L)	156 - 120 (1/2)
Chloride (mg/L)	20.7 - 73.0 (1/2)
Magnesium (mg/L)	25.8 - 30.6 (1/2)
Total Suspended Solids (mg/L)	2 - 10 (1/2)

Well #2	
Constituent (units)	Concentration
Aluminum (mg/L)	0.291 (1/2)
Fluoride (mg/L)	0.9 - 0.9 (1/2)
Arsenic (mg/L)	0.004 (1/2)
Barium (mg/L)	0.001 - 0.0016 (1/2)
Copper (mg/L)	0.0032 - 0.004 (1/2)
Lead (mg/L)	0.0004 (1/2)
Nickel (mg/L)	0.0004 (1/2)
Thallium (mg/L)	0.0004 (1/2)
Phenols, total (mg/L)	0.047 - 0.06 (1/2)
Iron (mg/L)	0.240 - 0.463 (1/2)
Manganese (mg/L)	0.0051 - 0.0143 (1/2)
Sulfate (mg/L)	38 - 58.1 (1/2)
Chloride (mg/L)	9.8 - 10.1 (1/2)
Magnesium (mg/L)	30.9 - 18.5 (1/2)

Well #3	
Constituent (units)	Concentration
Aluminum (mg/L)	0.541 (1/2)
Fluoride (mg/L)	0.9 - 0.8 (1/2)
Molybdenum (mg/L)	0.0028 - 0.004 (1/2)
Arsenic (mg/L)	0.0038 (1/2)
Barium (mg/L)	0.0957 - 0.58 (1/2)
Chromium (mg/L)	0.0033 (1/2)
Copper (mg/L)	0.0015 - 0.0043 (1/2)
Lead (mg/L)	0.0011 (1/2)
Nickel (mg/L)	0.0046 (1/2)
Selenium (mg/L)	0.0006 (1/2)
Vanadium (mg/L)	0.0008 (1/2)
Phenols, total (mg/L)	0.043 (1/2)
Iron (mg/L)	0.441 (1/2)
Manganese (mg/L)	0.0077 - 0.0294 (1/2)
Sulfate (mg/L)	156 - 120 (1/2)
Chloride (mg/L)	20.7 - 73.0 (1/2)
Magnesium (mg/L)	25.8 - 30.6 (1/2)
Total Suspended Solids (mg/L)	2 - 10 (1/2)

Well #4	
Constituent (units)	Concentration
Aluminum (mg/L)	0.541 (1/2)
Fluoride (mg/L)	0.9 - 0.5 (1/2)
Molybdenum (mg/L)	0.004 - 0.0043 (1/2)
Arsenic (mg/L)	0.002 - 0.0039 (1/2)
Barium (mg/L)	0.001 - 0.001 (1/2)
Chromium (mg/L)	0.0022 - 0.002 (1/2)
Copper (mg/L)	0.0004 - 0.0011 (1/2)
Lead (mg/L)	0.0009 - 0.001 (1/2)
Nickel (mg/L)	0.0043 - 0.0146 (1/2)
Phenols, total (mg/L)	0.031 (1/2)
Iron (mg/L)	0.240 - 0.463 (1/2)
Manganese (mg/L)	0.0044 - 0.0076 (1/2)
Sulfate (mg/L)	109 - 111 (1/2)
Chloride (mg/L)	20 - 24.1 (1/2)
Magnesium (mg/L)	18.1 - 25.1 (1/2)
Total Suspended Solids (mg/L)	16 (1/2)

Reiter Farm	
Constituent (units)	Concentration
Fluoride (mg/L)	0.9 - 0.9 (1/2)
Molybdenum (mg/L)	0.0044 - 0.0043 (1/2)
Arsenic (mg/L)	0.0025 (1/2)
Barium (mg/L)	0.116 - 0.242 (1/2)
Copper (mg/L)	0.0041 - 0.007 (1/2)
Lead (mg/L)	0.0004 (1/2)
Nickel (mg/L)	0.0004 - 0.0146 (1/2)
Phenols, total (mg/L)	0.041 - 0.0043 (1/2)
Sulfate (mg/L)	64 - 108 (1/2)
Chloride (mg/L)	13.8 - 30 (1/2)
Magnesium (mg/L)	20.8 - 11.6 (1/2)
Total Suspended Solids (mg/L)	7 (1/2)

Well #2	
Constituent (units)	Concentration
Fluoride (mg/L)	0.9 - 0.7 (1/2)
Arsenic (mg/L)	0.0024 (1/2)
Barium (mg/L)	0.0017 - 0.012 (1/2)
Copper (mg/L)	0.001 - 0.001 (1/2)
Phenols, total (mg/L)	0.06 - 0.04 (1/2)
Iron (mg/L)	0.439 - 0.57 (1/2)
Manganese (mg/L)	0.0107 - 0.044 (1/2)
Sulfate (mg/L)	446 - 540 (1/2)
Chloride (mg/L)	12.4 - 13.7 (1/2)
Magnesium (mg/L)	11.46 - 11 (1/2)
Total Suspended Solids (mg/L)	4 - 8 (1/2)

Maximum Concentration Summary		
Constituent	Monitoring Point	Maximum Concentration
Aluminum (mg/L)	Well #4	1.83
Arsenic (mg/L)	Well #1	0.004
Barium (mg/L)	Well #1	1.08
Chloride (mg/L)	Reiter Farm	35
Chromium (mg/L)	Well #4	0.005
Copper (mg/L)	Reiter Farm	0.082
Fluoride (mg/L)	Well #1	0.9
Iron (mg/L)	Well #4	2.43
Lead (mg/L)	Reiter Farm	0.004
Magnesium (mg/L)	Well #2	40.1
Manganese (mg/L)	Well #4	0.0678
Molybdenum (mg/L)	Well #4	0.0091
Nickel (mg/L)	Well #4	0.0146
Selenium (mg/L)	Well #3	0.0056
Sulfate (mg/L)	Well #3	120
Sulfate (mg/L)	Well #2	120
Thallium (mg/L)	Well #1	0.0009
Vanadium (mg/L)	Well #4	0.0095
Zinc (mg/L)	Reiter Farm	0.118
Phenols, total (mg/L)	Reiter Farm	0.082



Site Map

<p>Legend</p> <ul style="list-style-type: none"> Approximate Location of Groundwater Monitoring Well Approximate Property Boundary 	<p>BMC Aggregates South Quarry La Porte City, Iowa Project No: 27223265.00 Drawing Date: January 2024</p>	
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Figure 3-1

Section 4.0 General Comments

The analysis and opinions expressed in this report are based upon data obtained from the samples collected at the indicated locations and from any other information discussed in this report. This report does not reflect any variation in subsurface stratigraphy, hydrogeology, or chemical concentrations that may occur between sampling locations or across the site. Actual subsurface conditions may vary and may not become evident without further exploration.

SCS has prepared this report for the exclusive use of our client for the specific application to the project discussed. No warranty is expressly stated or implied in this report with regard to the condition of substrate and groundwater below the surface of the facility. SCS has relied upon information furnished by others as noted in the report, and SCS accepts no responsibility for any deficiency, misstatements, or inaccuracy in this report as a result of misstatements, omissions, misrepresentations, fraudulent, or inaccurate information or data provided by others.

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Section 5.0 References

1. Robinson Engineering Company. *Groundwater Monitoring Plan, South Waterloo Quarry, August 2010.*
2. Barker Lemar Engineering Consultants. *Groundwater Statistical Program, BMC Quarry CCR Beneficial Use Site, January 2011.*
3. Geological Society of Iowa. *Geology and Reclamation at the Waterloo South Quarry, Black Hawk County, Iowa. April 22, 2017.*
4. Evora Consulting, *2022 Annual Water Quality Report, BMC Aggregates, L.C., South Quarry, Beneficial Use Site, February 2023.*

Appendix A

Field Sampling Information

Waterloo South Quarry Monitoring Well Reports
Beneficial Use Reclamation Project

March 15, 2023

	Well #1	Well #2	Well #3	Well #4	Upgradient Well
Water Level (feet)	82.2	78.5	77.8	51.2	NA
pH (S.U.)	7.90	8.10	8.20	8.30	7.50
Temperature (° F)	47.6	47.6	47.3	49.8	46.7
Conductivity (µS/cm)	635.6	769.2	705.3	737.3	640.4

Note: " Water Level" refers to the hydrostatic head of the well.

Waterloo South Quarry Monitoring Well Reports
Beneficial Use Reclamation Project

October 18, 2023

	Well #1	Well #2	Well #3	Well #4	Upgradient Well
Water Level (feet)	76.0	74.2	72.9	42.9	NA
pH (S.U.)	7.70	7.70	7.60	7.70	7.60
Temperature (° F)	52.0	51.0	52.0	55.0	56.0
Conductivity (µS/cm)	589.0	695.0	612.0	672.0	636.0

Note: " Water Level" refers to the hydrostatic head of the well.

Appendix B
Laboratory Analytical Data Sheets

3/31/2023

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

RE: Project: GW Monitoring
Project Number: Miller Creek Area

This analytical report is for the samples received on 3/16/2023 12:00:00PM. If you have any questions concerning this report please feel free to contact me at 1-800-858-5227. The samples included in this analytical report are as follows:

Sample ID	Laboratory ID	Matrix	Date Sampled
Well #1	1GC1696-01	Water	03/14/23 08:00
Well #2	1GC1696-02	Water	03/15/23 00:00
Well #3	1GC1696-03	Water	03/14/23 09:00
Well #4	1GC1696-04	Water	03/14/23 09:30
Upgradient Well	1GC1696-05	Water	03/14/23 10:30

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Sincerely,

A handwritten signature in black ink that reads "Heather Tisdale".

Heather Tisdale, Project Manager I

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

CASE NARRATIVE

All analytical results for this Work Order meet(s) the laboratory established acceptance criteria for the method(s) requested with the following exceptions.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #1
1GC1696-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			96.3 %	79-129		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			102 %	66-134		"	"	"	"	
<i>Surrogate: Toluene-d8</i>			97.7 %	91-113		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			96.4 %	83-112		"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.060		0.035	"	"	1GC1174	03/22/23	03/23/23	EPA 420.1	
Solids, total dissolved	341		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	ND		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

Determination of Inorganic Anions

Chloride	10.1	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.9		0.1	"	"	"	"	"	"	
Sulfate	38.0	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.050		0.050	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Arsenic, total	0.0040	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	1.08	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0011	0.0007	0.0020	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #1
1GC1696-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Total Metals

Copper, total	0.0084	0.0008	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Iron, total	0.463	0.047	0.100	"	1	1GC1081	03/22/23	03/22/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	31.5	0.06	0.10	"	"	1GC1081	03/22/23	03/22/23	200.7	
Manganese, total	0.0142	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	ND	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0044	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0008	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	ND	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	0.0009	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0051	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	0.0182	0.0174	0.0200	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #2
1GC1696-02(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			92.8 %							79-129
<i>Surrogate: 1,2-Dichloroethane-d4</i>			95.1 %							66-134
<i>Surrogate: Toluene-d8</i>			106 %							91-113
<i>Surrogate: 4-Bromofluorobenzene</i>			104 %							83-112

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.060		0.035	"	"	1GC1244	03/23/23	03/27/23	EPA 420.1	
Solids, total dissolved	456		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	4		2	"	2	1GC1088	03/22/23	03/22/23	USGS I-3765-85	

Determination of Inorganic Anions

Chloride	13.3	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.7		0.1	"	"	"	"	"	"	
Sulfate	116	1.8	5.0	"	5	1GC1235	03/22/23	03/22/23	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	ND		0.050	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Arsenic, total	0.0024	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.162	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0009	0.0007	0.0020	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #2
1GC1696-02(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Total Metals

Copper, total	0.0041	0.0008	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Iron, total	0.439	0.047	0.100	"	1	1GC1081	03/22/23	03/22/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	37.0	0.06	0.10	"	"	1GC1081	03/22/23	03/22/23	200.7	
Manganese, total	0.0648	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	ND	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0017	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	ND	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	ND	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	0.0006	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0058	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.7 %		79-129	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			100 %		66-134	"	"	"	"	
<i>Surrogate: Toluene-d8</i>			102 %		91-113	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			94.9 %		83-112	"	"	"	"	

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			84.1 %		19-139	"	"	"	"	
<i>Surrogate: Phenol-d6</i>			57.9 %		14-154	"	"	"	"	
<i>Surrogate: 2,4,6-Tribromophenol</i>			82.7 %		21-151	"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	0.021		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Solids, total dissolved	445		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	2		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	20.3	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.2		0.1	"	"	"	"	"	"	
Sulfate	120	1.8	5.0	"	5	1GC1235	03/22/23	03/22/23	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.549		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0026	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.180	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	0.0007	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0031	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0089	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	0.441	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	25.3	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0299	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0060	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0046	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0011	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0056	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0088	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03RE1(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Conventional Chemistry Parameters

Phenols, total	ND		0.035	mg/L	1	1GC1550	03/29/23	03/30/23	EPA 420.1	
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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.3 %			"	"	"	"	79-129
<i>Surrogate: 1,2-Dichloroethane-d4</i>			96.3 %			"	"	"	"	66-134
<i>Surrogate: Toluene-d8</i>			99.1 %			"	"	"	"	91-113
<i>Surrogate: 4-Bromofluorobenzene</i>			102 %			"	"	"	"	83-112

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			85.7 %			"	"	"	"	19-139
<i>Surrogate: Phenol-d6</i>			60.4 %			"	"	"	"	14-154
<i>Surrogate: 2,4,6-Tribromophenol</i>			84.4 %			"	"	"	"	21-151

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Solids, total dissolved	479		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	ND		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	24.1	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.5		0.1	"	"	"	"	"	"	
Sulfate	109	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.074		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0029	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.203	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	0.0005	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0022	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0068	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	0.243	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	29.2	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0468	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0091	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0146	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0009	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	0.0010	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0029	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0066	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04RE1(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Conventional Chemistry Parameters

Phenols, total	ND		0.035	mg/L	1	1GC1550	03/29/23	03/30/23	EPA 420.1	
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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Upgradient Well
1GC1696-05(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.9 %		79-129	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			95.3 %		66-134	"	"	"	"	
<i>Surrogate: Toluene-d8</i>			106 %		91-113	"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			101 %		83-112	"	"	"	"	

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			85.5 %		19-139	"	"	"	"	
<i>Surrogate: Phenol-d6</i>			58.9 %		14-154	"	"	"	"	
<i>Surrogate: 2,4,6-Tribromophenol</i>			76.1 %		21-151	"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.057		0.035	"	"	1GC1244	03/23/23	03/27/23	EPA 420.1	
Solids, total dissolved	360		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	2		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Upgradient Well
1GC1696-05(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	26.8	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.5		0.1	"	"	"	"	"	"	
Sulfate	56.0	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	ND		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0025	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.267	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	0.00009	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0012	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0820	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	ND	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	23.6	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0034	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0044	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0034	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0040	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0037	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0067	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	0.118	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC0950 - EPA 5030B

Blank (1GC0950-BLK1)

Prepared & Analyzed: 03/18/23

Surrogate: Dibromofluoromethane	47.6			ug/L	50.3520		94.6	79-129			
Surrogate: 1,2-Dichloroethane-d4	50.9			"	50.4080		101	66-134			
Surrogate: Toluene-d8	54.4			"	50.2360		108	91-113			
Surrogate: 4-Bromofluorobenzene	50.6			"	50.4200		100	83-112			
2-Butanone (MEK)	ND		10.0	"							
Chloroform	ND		1.0	"							
Benzene	ND		1.0	"							

LCS (1GC0950-BS1)

Prepared & Analyzed: 03/18/23

Surrogate: Dibromofluoromethane	47.3			ug/L	50.3520		93.9	79-129			
Surrogate: 1,2-Dichloroethane-d4	46.9			"	50.4080		93.1	66-134			
Surrogate: Toluene-d8	53.1			"	50.2360		106	91-113			
Surrogate: 4-Bromofluorobenzene	46.9			"	50.4200		93.0	83-112			
2-Butanone (MEK)	81.73		10.0	"	100.500		81.3	44-158			
Chloroform	47.79		1.0	"	50.1000		95.4	76-132			
Benzene	54.35		1.0	"	50.1525		108	77-130			

LCS Dup (1GC0950-BSD1)

Prepared & Analyzed: 03/18/23

Surrogate: Dibromofluoromethane	48.1			ug/L	50.3520		95.6	79-129			
Surrogate: 1,2-Dichloroethane-d4	50.5			"	50.4080		100	66-134			
Surrogate: Toluene-d8	52.0			"	50.2360		103	91-113			
Surrogate: 4-Bromofluorobenzene	46.9			"	50.4200		93.1	83-112			
2-Butanone (MEK)	97.40		10.0	"	100.500		96.9	44-158	17.5	25	
Chloroform	46.04		1.0	"	50.1000		91.9	76-132	3.73	26	
Benzene	51.58		1.0	"	50.1525		103	77-130	5.23	27	

Matrix Spike (1GC0950-MS1)

Source: 1GC1689-03

Prepared & Analyzed: 03/18/23

Surrogate: Dibromofluoromethane	189			ug/L	201.408		93.6	79-129			
Surrogate: 1,2-Dichloroethane-d4	191			"	201.632		94.8	66-134			
Surrogate: Toluene-d8	207			"	200.944		103	91-113			

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC0950 - EPA 5030B

Matrix Spike (1GC0950-MS1)

Source: 1GC1689-03

Prepared & Analyzed: 03/18/23

Surrogate: 4-Bromofluorobenzene	195			ug/L	201.680		96.7	83-112			
2-Butanone (MEK)	411.5		40.0	"	402.000	ND	102	48-169			
Chloroform	204.3		4.0	"	200.400	18.42	92.7	75-133			
Benzene	215.3		4.0	"	200.610	ND	107	79-128			

Matrix Spike Dup (1GC0950-MSD1)

Source: 1GC1689-03

Prepared: 03/18/23 Analyzed: 03/19/23

Surrogate: Dibromofluoromethane	196			ug/L	201.408		97.2	79-129			
Surrogate: 1,2-Dichloroethane-d4	196			"	201.632		97.0	66-134			
Surrogate: Toluene-d8	217			"	200.944		108	91-113			
Surrogate: 4-Bromofluorobenzene	191			"	201.680		94.5	83-112			
2-Butanone (MEK)	339.3		40.0	"	402.000	ND	84.4	48-169	19.2	17	QR-02
Chloroform	183.2		4.0	"	200.400	18.42	82.2	75-133	10.9	16	
Benzene	191.8		4.0	"	200.610	ND	95.6	79-128	11.6	12	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Base/Neutral Extractable Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC0973 - EPA 625 BNA											
Blank (1GC0973-BLK1)											
						Prepared: 03/20/23 Analyzed: 03/30/23					
Pyridine	ND		10	ug/L							
LCS (1GC0973-BS1)											
						Prepared: 03/20/23 Analyzed: 03/30/23					
Pyridine	15.2		10	ug/L	41.6667		36.6	13-127			
Reference (1GC0973-SRM1)											
						Prepared: 03/20/23 Analyzed: 03/30/23					
Pyridine	42.1		10	ug/L	41.6667		101	80-120			

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Acid Extractable Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC0973 - EPA 625 BNA

Blank (1GC0973-BLK1)

Prepared: 03/20/23 Analyzed: 03/30/23

Surrogate: 2-Fluorophenol	47.3			ug/L	60.6000		78.0	19-139			
Surrogate: Phenol-d6	30.1			"	61.9000		48.6	14-154			
Surrogate: 2,4,6-Tribromophenol	53.6			"	62.2500		86.1	21-151			
2-Methylphenol (o-Cresol)	ND		10.0	"							
(3 & 4)-Methylphenol	ND		10.0	"							

LCS (1GC0973-BS1)

Prepared: 03/20/23 Analyzed: 03/30/23

Surrogate: 2-Fluorophenol	36.8			ug/L	60.6000		60.7	19-139			
Surrogate: Phenol-d6	22.7			"	61.9000		36.7	14-154			
Surrogate: 2,4,6-Tribromophenol	46.5			"	62.2500		74.7	21-151			
2-Methylphenol (o-Cresol)	34.5		10.0	"	41.6667		82.8	50-138			
(3 & 4)-Methylphenol	34.7		10.0	"	41.6667		83.2	56-130			

Reference (1GC0973-SRM1)

Prepared: 03/20/23 Analyzed: 03/30/23

Surrogate: 2-Fluorophenol	60.0			ug/L	60.6000		99.0	19-139			
Surrogate: Phenol-d6	62.6			"	61.9000		101	14-154			
Surrogate: 2,4,6-Tribromophenol	58.4			"	62.2500		93.8	21-151			
2-Methylphenol (o-Cresol)	42.8		10.0	"	41.6667		103	80-120			
(3 & 4)-Methylphenol	42.5		10.0	"	41.6667		102	80-120			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Carbonyl Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC0912 - EPA 8315 Aldehydes											
Blank (1GC0912-BLK1)					Prepared: 03/17/23 Analyzed: 03/20/23						
Formaldehyde	ND		10.0	ug/L							
LCS (1GC0912-BS1)					Prepared: 03/17/23 Analyzed: 03/20/23						
Formaldehyde	408.5		10.0	ug/L	500.000		81.7	61-142			
Matrix Spike (1GC0912-MS1)					Source: 1GC1696-01		Prepared: 03/17/23 Analyzed: 03/20/23				
Formaldehyde	493.0		10.0	ug/L	500.000	ND	98.6	48-148			
Matrix Spike Dup (1GC0912-MSD1)					Source: 1GC1696-01		Prepared: 03/17/23 Analyzed: 03/20/23				
Formaldehyde	472.5		10.0	ug/L	500.000	ND	94.5	48-148	4.25	30	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Conventional Chemistry Parameters - Quality Control

Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC0951 - Wet Chem Preparation

Blank (1GC0951-BLK1)					Prepared & Analyzed: 03/20/23						
Solids, total suspended	ND		1	mg/L							
LCS (1GC0951-BS1)					Prepared & Analyzed: 03/20/23						
Solids, total suspended	14.4		1	mg/L	15.0000		96.0	74-114			
Duplicate (1GC0951-DUP1)					Source: 1GC1492-01		Prepared & Analyzed: 03/20/23				
Solids, total suspended	103		7	mg/L		99.3			3.30	30	

Batch 1GC1028 - Wet Chem Preparation

Blank (1GC1028-BLK1)					Prepared: 03/20/23 Analyzed: 03/21/23						
Solids, total dissolved	ND		5	mg/L							
LCS (1GC1028-BS1)					Prepared: 03/20/23 Analyzed: 03/21/23						
Solids, total dissolved	100		5	mg/L	100.0000		100	71-114			
Duplicate (1GC1028-DUP1)					Source: 1GC1553-01		Prepared: 03/20/23 Analyzed: 03/21/23				
Solids, total dissolved	1940		5	mg/L		1930			0.310	30	

Batch 1GC1088 - Wet Chem Preparation

Blank (1GC1088-BLK1)					Prepared & Analyzed: 03/22/23						
Solids, total suspended	ND		1	mg/L							
LCS (1GC1088-BS1)					Prepared & Analyzed: 03/22/23						
Solids, total suspended	14.4		1	mg/L	15.0000		96.0	74-114			

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Conventional Chemistry Parameters - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC1088 - Wet Chem Preparation											
Duplicate (1GC1088-DUP1)			Source: 1GC1642-01			Prepared & Analyzed: 03/22/23					
Solids, total suspended	188		20	mg/L		192			2.11	30	
Batch 1GC1174 - Wet Chem Preparation											
Blank (1GC1174-BLK1)			Prepared: 03/22/23 Analyzed: 03/23/23								
Phenols, total	ND		0.035	mg/L							
LCS (1GC1174-BS1)			Prepared: 03/22/23 Analyzed: 03/23/23								
Phenols, total	0.383		0.035	mg/L	0.400000		95.8	62-110			
Matrix Spike (1GC1174-MS1)			Source: 1GC1696-01			Prepared: 03/22/23 Analyzed: 03/23/23					
Phenols, total	0.377		0.035	mg/L	0.400000	0.0600	79.2	57-124			
Matrix Spike Dup (1GC1174-MSD1)			Source: 1GC1696-01			Prepared: 03/22/23 Analyzed: 03/23/23					
Phenols, total	0.399		0.035	mg/L	0.400000	0.0600	84.7	57-124	5.72	21	
Batch 1GC1244 - Wet Chem Preparation											
Blank (1GC1244-BLK1)			Prepared: 03/23/23 Analyzed: 03/27/23								
Phenols, total	ND		0.035	mg/L							
LCS (1GC1244-BS1)			Prepared: 03/23/23 Analyzed: 03/27/23								
Phenols, total	0.491		0.035	mg/L	0.400000		123	62-110			QS-01
Matrix Spike (1GC1244-MS1)			Source: 1GC1695-01			Prepared: 03/23/23 Analyzed: 03/27/23					
Phenols, total	0.500		0.035	mg/L	0.400000	0.0505	112	57-124			

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Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Conventional Chemistry Parameters - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
Batch 1GC1244 - Wet Chem Preparation											
Matrix Spike Dup (1GC1244-MSD1)			Source: 1GC1695-01			Prepared: 03/23/23 Analyzed: 03/27/23					
Phenols, total	0.459		0.035	mg/L	0.400000	0.0505	102	57-124	8.58	21	
Batch 1GC1411 - Wet Chem Preparation											
Blank (1GC1411-BLK1)			Prepared: 03/28/23 Analyzed: 03/29/23								
COD, total	ND		20	mg/L							
LCS (1GC1411-BS1)			Prepared: 03/28/23 Analyzed: 03/29/23								
COD, total	109		27	mg/L	100.000		109	90-110			
LCS (1GC1411-BS2)			Prepared: 03/28/23 Analyzed: 03/29/23								
COD, total	79.5		20	mg/L	75.0000		106	90-110			
LCS (1GC1411-BS3)			Prepared: 03/28/23 Analyzed: 03/29/23								
COD, total	81.8		20	mg/L	75.0000		109	90-110			
LCS (1GC1411-BS4)			Prepared: 03/28/23 Analyzed: 03/29/23								
COD, total	82.4		20	mg/L	75.0000		110	90-110			
Matrix Spike (1GC1411-MS1)			Source: 1GC1696-01			Prepared: 03/28/23 Analyzed: 03/29/23					
COD, total	119		27	mg/L	100.000	ND	119	90-110			QM-14
Matrix Spike Dup (1GC1411-MSD1)			Source: 1GC1696-01			Prepared: 03/28/23 Analyzed: 03/29/23					
COD, total	114		27	mg/L	100.000	ND	114	90-110	4.18	10	QM-14
Batch 1GC1550 - Wet Chem Preparation											
Blank (1GC1550-BLK1)			Prepared: 03/29/23 Analyzed: 03/30/23								
Phenols, total	ND		0.035	mg/L							

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Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Conventional Chemistry Parameters - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC1550 - Wet Chem Preparation											
LCS (1GC1550-BS1)					Prepared: 03/29/23 Analyzed: 03/30/23						
Phenols, total	0.408		0.035	mg/L	0.400000		102	62-110			
Matrix Spike (1GC1550-MS1)					Source: 1GC2157-04 Prepared: 03/29/23 Analyzed: 03/30/23						
Phenols, total	0.380		0.035	mg/L	0.400000	ND	95.0	57-124			
Matrix Spike Dup (1GC1550-MSD1)					Source: 1GC2157-04 Prepared: 03/29/23 Analyzed: 03/30/23						
Phenols, total	0.507		0.035	mg/L	0.400000	ND	127	57-124	28.6	21	QM-07
Batch 1GC1594 - General Prep HPLC/IC											
Blank (1GC1594-BLK1)					Prepared & Analyzed: 03/30/23						
Nitrogen, Ammonia	ND		0.10	mg/L							
LCS (1GC1594-BS1)					Prepared & Analyzed: 03/30/23						
Nitrogen, Ammonia	4.96		0.10	mg/L	5.00000		99.1	90-114			
Matrix Spike (1GC1594-MS1)					Source: 1GC1696-01 Prepared & Analyzed: 03/30/23						
Nitrogen, Ammonia	5.36		0.10	mg/L	5.00000	ND	107	84-115			
Matrix Spike Dup (1GC1594-MSD1)					Source: 1GC1696-01 Prepared & Analyzed: 03/30/23						
Nitrogen, Ammonia	5.44		0.10	mg/L	5.00000	ND	109	84-115	1.51	20	
Batch 1GC1683 - TOX/TX/EOX											
Blank (1GC1683-BLK1)					Prepared & Analyzed: 03/31/23						
Total Organic Halogens (TOX)	ND		0.010	mg/L							

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Elk Run Heights, IA 50707
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Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Conventional Chemistry Parameters - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC1683 - TOX/TX/EOX											
LCS (1GC1683-BS1)						Prepared & Analyzed: 03/31/23					
Total Organic Halogens (TOX)	0.1155		0.010	mg/L	0.111060		104	76-114			
LCS Dup (1GC1683-BSD1)						Prepared & Analyzed: 03/31/23					
Total Organic Halogens (TOX)	0.1116		0.010	mg/L	0.111060		101	76-114	3.41	18	
Reference (1GC1683-SRM1)						Prepared & Analyzed: 03/31/23					
Total Organic Halogens (TOX)	0.1095		0.010	mg/L	0.108908		101	90-110			
Reference (1GC1683-SRM2)						Prepared & Analyzed: 03/31/23					
Total Organic Halogens (TOX)	0.1025		0.010	mg/L	0.108908		94.2	90-110			
Reference (1GC1683-SRM3)						Prepared & Analyzed: 03/31/23					
Total Organic Halogens (TOX)	0.1117		0.010	mg/L	0.108908		103	90-110			

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Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Inorganic Anions - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC1118 - General Prep HPLC/IC											
Blank (1GC1118-BLK2) Prepared & Analyzed: 03/21/23											
Fluoride	ND		0.1	mg/L							
Chloride	ND	0.3	1.0	"							
Sulfate	ND	0.4	1.0	"							
LCS (1GC1118-BS1) Prepared & Analyzed: 03/21/23											
Fluoride	1.22		0.1	mg/L	1.28606		95.1	80-120			
Chloride	15.12	0.3	1.0	"	15.5751		97.1	80-120			
Sulfate	33.55	0.4	1.0	"	34.2650		97.9	80-120			
LCS Dup (1GC1118-BSD1) Prepared & Analyzed: 03/21/23											
Fluoride	1.22		0.1	mg/L	1.28606		95.0	80-120	0.0818	10	
Chloride	15.13	0.3	1.0	"	15.5751		97.1	80-120	0.0860	10	
Sulfate	33.20	0.4	1.0	"	34.2650		96.9	80-120	1.05	10	
MRL Check (1GC1118-MRL1) Prepared & Analyzed: 03/21/23											
Fluoride	0.04		0.1	mg/L	0.0479588		85.5	50-150			
Chloride	0.70	0.3	1.0	"	0.615300		114	50-150			
Sulfate	1.14	0.4	1.0	"	1.10748		103	0-200			
Matrix Spike (1GC1118-MS1) Source: 1GC1482-01 Prepared & Analyzed: 03/21/23											
Fluoride	11.91		1.0	mg/L	12.8606	ND	92.6	77-121			
Chloride	236.4	3.4	10.0	"	155.751	74.64	104	81-116			
Sulfate	400.8	3.6	10.0	"	342.650	58.50	99.9	87-113			
Matrix Spike Dup (1GC1118-MSD1) Source: 1GC1482-01 Prepared & Analyzed: 03/21/23											
Fluoride	11.94		1.0	mg/L	12.8606	ND	92.8	77-121	0.252	10	
Chloride	235.1	3.4	10.0	"	155.751	74.64	103	81-116	0.577	10	
Sulfate	407.8	3.6	10.0	"	342.650	58.50	102	87-113	1.73	10	

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Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Inorganic Anions - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1235 - General Prep HPLC/IC

Blank (1GC1235-BLK1)

Prepared & Analyzed: 03/22/23

Sulfate ND 0.4 1.0 mg/L

LCS (1GC1235-BS1)

Prepared & Analyzed: 03/22/23

Sulfate 33.45 0.4 1.0 mg/L 34.2650 97.6 80-120

LCS Dup (1GC1235-BSD1)

Prepared & Analyzed: 03/22/23

Sulfate 33.11 0.4 1.0 mg/L 34.2650 96.6 80-120 1.04 10

MRL Check (1GC1235-MRL1)

Prepared & Analyzed: 03/22/23

Sulfate 1.21 0.4 1.0 mg/L 1.10748 109 0-200

Matrix Spike (1GC1235-MS1)

Source: 1GC1937-01

Prepared & Analyzed: 03/22/23

Sulfate 391.2 3.6 10.0 mg/L 342.650 54.04 98.4 87-113

Matrix Spike Dup (1GC1235-MSD1)

Source: 1GC1937-01

Prepared & Analyzed: 03/22/23

Sulfate 402.1 3.6 10.0 mg/L 342.650 54.04 102 87-113 2.77 10

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Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control

Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1081 - EPA 200.2 Total ICP-OES (200.7)

Blank (1GC1081-BLK1)

Prepared & Analyzed: 03/22/23

Aluminum, total	ND		0.050	mg/L							
Boron, total	ND	0.056	0.100	"							
Iron, total	ND	0.047	0.100	"							
Magnesium, total	ND	0.06	0.10	"							

LCS (1GC1081-BS1)

Prepared & Analyzed: 03/22/23

Aluminum, total	2.33		0.050	mg/L	2.20000		106	85-115			
Boron, total	0.227	0.056	0.100	"	0.200000		114	85-115			
Iron, total	2.43	0.047	0.100	"	2.20000		110	85-115			
Magnesium, total	2.38	0.06	0.10	"	2.20000		108	85-115			

Matrix Spike (1GC1081-MS1)

Source: 1GC1501-01

Prepared & Analyzed: 03/22/23

Aluminum, total	2.39		0.050	mg/L	2.20000	0.0847	105	70-130			
Boron, total	0.447	0.056	0.100	"	0.200000	0.214	116	70-130			
Iron, total	4.04	0.047	0.100	"	2.20000	1.49	116	70-130			
Magnesium, total	17.1	0.06	0.10	"	2.20000	14.0	139	70-130			QM-4X

Matrix Spike Dup (1GC1081-MSD1)

Source: 1GC1501-01

Prepared & Analyzed: 03/22/23

Aluminum, total	2.34		0.050	mg/L	2.20000	0.0847	103	70-130	2.07	20	
Boron, total	0.425	0.056	0.100	"	0.200000	0.214	106	70-130	4.99	20	
Iron, total	3.83	0.047	0.100	"	2.20000	1.49	106	70-130	5.30	20	
Magnesium, total	16.1	0.06	0.10	"	2.20000	14.0	94.9	70-130	5.87	20	

Post Spike (1GC1081-PS1)

Source: 1GC1501-01

Prepared & Analyzed: 03/22/23

Aluminum, total	8.77			mg/L	8.80000	0.0847	98.7	85-115			
Boron, total	1.07			"	0.800000	0.214	107	85-115			
Iron, total	10.7			"	8.80000	1.49	105	85-115			
Magnesium, total	23.2			"	8.80000	14.0	105	85-115			

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1082 - EPA 200.2 Total ICP-OES (200.7)

Blank (1GC1082-BLK1)

Prepared: 03/22/23 Analyzed: 03/23/23

Aluminum, total	ND		0.050	mg/L							
Boron, total	ND	0.056	0.100	"							
Iron, total	ND	0.047	0.100	"							
Magnesium, total	ND	0.06	0.10	"							

LCS (1GC1082-BS1)

Prepared: 03/22/23 Analyzed: 03/23/23

Aluminum, total	2.23		0.050	mg/L	2.20000		102	85-115			
Boron, total	0.216	0.056	0.100	"	0.200000		108	85-115			
Iron, total	2.37	0.047	0.100	"	2.20000		108	85-115			
Magnesium, total	2.29	0.06	0.10	"	2.20000		104	85-115			

Matrix Spike (1GC1082-MS1)

Source: 1GC1696-03

Prepared: 03/22/23 Analyzed: 03/23/23

Aluminum, total	2.86		0.050	mg/L	2.20000	0.549	105	70-130			
Boron, total	0.259	0.056	0.100	"	0.200000	ND	130	70-130			
Iron, total	2.80	0.047	0.100	"	2.20000	0.441	107	70-130			
Magnesium, total	27.3	0.06	0.10	"	2.20000	25.3	92.4	70-130			

Matrix Spike Dup (1GC1082-MSD1)

Source: 1GC1696-03

Prepared: 03/22/23 Analyzed: 03/23/23

Aluminum, total	2.88		0.050	mg/L	2.20000	0.549	106	70-130	0.851	20	
Boron, total	0.256	0.056	0.100	"	0.200000	ND	128	70-130	1.17	20	
Iron, total	2.81	0.047	0.100	"	2.20000	0.441	108	70-130	0.438	20	
Magnesium, total	27.2	0.06	0.10	"	2.20000	25.3	86.9	70-130	0.446	20	

Post Spike (1GC1082-PS1)

Source: 1GC1696-03

Prepared: 03/22/23 Analyzed: 03/23/23

Aluminum, total	9.40			mg/L	8.80000	0.549	101	85-115			
Boron, total	0.856			"	0.800000	0.0361	102	85-115			
Iron, total	9.58			"	8.80000	0.441	104	85-115			
Magnesium, total	34.7			"	8.80000	25.3	108	85-115			

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1159 - EPA 7470A Hg Water

Blank (1GC1159-BLK1)

Prepared: 03/22/23 Analyzed: 03/24/23

Mercury, total ND 0.00013 0.00020 mg/L

LCS (1GC1159-BS1)

Prepared: 03/22/23 Analyzed: 03/24/23

Mercury, total 0.00276 0.00013 0.00020 mg/L 0.00250000 111 87-118

Matrix Spike (1GC1159-MS1)

Source: 1GC1696-01

Prepared: 03/22/23 Analyzed: 03/24/23

Mercury, total 0.00249 0.00013 0.00020 mg/L 0.00250000 ND 99.7 62-131

Matrix Spike Dup (1GC1159-MSD1)

Source: 1GC1696-01

Prepared: 03/22/23 Analyzed: 03/24/23

Mercury, total 0.00239 0.00013 0.00020 mg/L 0.00250000 ND 95.5 62-131 4.29 17

Batch 1GC1180 - EPA 200.2 Total ICP-MS

Blank (1GC1180-BLK1)

Prepared: 03/22/23 Analyzed: 03/23/23

Antimony, total	ND	0.0008	0.0020	mg/L							
Arsenic, total	0.0008	0.0006	0.0020	"							
Barium, total	ND	0.0002	0.0020	"							
Beryllium, total	ND	0.0001	0.0020	"							
Cadmium, total	ND	0.00008	0.0002	"							
Chromium, total	ND	0.0007	0.0020	"							
Cobalt, total	ND	0.0005	0.0020	"							
Copper, total	ND	0.0008	0.0020	"							
Lead, total	ND	0.0005	0.0008	"							
Manganese, total	ND	0.0017	0.0040	"							
Molybdenum, total	ND	0.0006	0.0020	"							
Nickel, total	ND	0.0007	0.0040	"							
Selenium, total	ND	0.0011	0.0040	"							
Silver, total	ND	0.0015	0.0020	"							
Thallium, total	ND	0.0004	0.0008	"							
Vanadium, total	ND	0.0043	0.0080	"							
Zinc, total	ND	0.0174	0.0200	"							

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101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control

Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1180 - EPA 200.2 Total ICP-MS

LCS (1GC1180-BS1)

Prepared: 03/22/23 Analyzed: 03/23/23

Antimony, total	0.182	0.0008	0.0020	mg/L	0.200000		90.8	85-115			
Arsenic, total	0.181	0.0006	0.0020	"	0.200000		90.5	85-115			
Barium, total	0.211	0.0002	0.0020	"	0.200000		105	85-115			
Beryllium, total	0.185	0.0001	0.0020	"	0.200000		92.6	85-115			
Cadmium, total	0.178	0.00008	0.0002	"	0.200000		89.2	85-115			
Chromium, total	0.191	0.0007	0.0020	"	0.200000		95.6	85-115			
Cobalt, total	0.201	0.0005	0.0020	"	0.200000		101	85-115			
Copper, total	0.195	0.0008	0.0020	"	0.200000		97.4	85-115			
Lead, total	0.190	0.0005	0.0008	"	0.200000		95.1	85-115			
Manganese, total	0.191	0.0017	0.0040	"	0.200000		95.5	85-115			
Molybdenum, total	0.189	0.0006	0.0020	"	0.200000		94.6	85-115			
Nickel, total	0.199	0.0007	0.0040	"	0.200000		99.4	85-115			
Selenium, total	0.167	0.0011	0.0040	"	0.200000		83.3	85-115			QS-01
Silver, total	0.193	0.0015	0.0020	"	0.200000		96.4	85-115			
Thallium, total	0.178	0.0004	0.0008	"	0.200000		88.9	85-115			
Vanadium, total	0.201	0.0043	0.0080	"	0.200000		101	85-115			
Zinc, total	0.174	0.0174	0.0200	"	0.200000		87.1	85-115			

Matrix Spike (1GC1180-MS1)

Source: 1GC1696-01

Prepared: 03/22/23 Analyzed: 03/23/23

Antimony, total	0.188	0.0008	0.0020	mg/L	0.200000	ND	94.0	70-130			
Arsenic, total	0.194	0.0006	0.0020	"	0.200000	0.0040	94.8	70-130			
Barium, total	1.33	0.0002	0.0020	"	0.200000	1.08	123	70-130			
Beryllium, total	0.185	0.0001	0.0020	"	0.200000	ND	92.4	70-130			
Cadmium, total	0.180	0.00008	0.0002	"	0.200000	ND	90.2	70-130			
Chromium, total	0.192	0.0007	0.0020	"	0.200000	0.0011	95.4	70-130			
Cobalt, total	0.206	0.0005	0.0020	"	0.200000	ND	103	70-130			
Copper, total	0.191	0.0008	0.0020	"	0.200000	0.0084	91.4	70-130			
Lead, total	0.186	0.0005	0.0008	"	0.200000	0.0008	92.9	70-130			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1180 - EPA 200.2 Total ICP-MS

Matrix Spike (1GC1180-MS1)		Source: 1GC1696-01			Prepared: 03/22/23		Analyzed: 03/23/23	
Manganese, total	0.196	0.0017	0.0040	mg/L	0.200000	0.0142	91.0	70-130
Molybdenum, total	0.212	0.0006	0.0020	"	0.200000	ND	106	70-130
Nickel, total	0.199	0.0007	0.0040	"	0.200000	0.0044	97.2	70-130
Selenium, total	0.173	0.0011	0.0040	"	0.200000	ND	86.6	70-130
Silver, total	0.195	0.0015	0.0020	"	0.200000	ND	97.5	70-130
Thallium, total	0.180	0.0004	0.0008	"	0.200000	0.0009	89.4	70-130
Vanadium, total	0.196	0.0043	0.0080	"	0.200000	0.0051	95.3	70-130
Zinc, total	0.189	0.0174	0.0200	"	0.200000	0.0182	85.4	70-130

Matrix Spike Dup (1GC1180-MSD1)		Source: 1GC1696-01			Prepared: 03/22/23		Analyzed: 03/23/23			
Antimony, total	0.179	0.0008	0.0020	mg/L	0.200000	ND	89.7	70-130	4.69	20
Arsenic, total	0.184	0.0006	0.0020	"	0.200000	0.0040	90.0	70-130	5.01	20
Barium, total	1.28	0.0002	0.0020	"	0.200000	1.08	101	70-130	3.45	20
Beryllium, total	0.177	0.0001	0.0020	"	0.200000	ND	88.6	70-130	4.17	20
Cadmium, total	0.171	0.00008	0.0002	"	0.200000	ND	85.6	70-130	5.18	20
Chromium, total	0.182	0.0007	0.0020	"	0.200000	0.0011	90.4	70-130	5.33	20
Cobalt, total	0.193	0.0005	0.0020	"	0.200000	ND	96.5	70-130	6.57	20
Copper, total	0.180	0.0008	0.0020	"	0.200000	0.0084	85.8	70-130	6.03	20
Lead, total	0.177	0.0005	0.0008	"	0.200000	0.0008	88.0	70-130	5.33	20
Manganese, total	0.191	0.0017	0.0040	"	0.200000	0.0142	88.3	70-130	2.73	20
Molybdenum, total	0.203	0.0006	0.0020	"	0.200000	ND	101	70-130	4.33	20
Nickel, total	0.188	0.0007	0.0040	"	0.200000	0.0044	92.0	70-130	5.38	20
Selenium, total	0.168	0.0011	0.0040	"	0.200000	ND	83.9	70-130	3.20	20
Silver, total	0.184	0.0015	0.0020	"	0.200000	ND	91.9	70-130	5.88	20
Thallium, total	0.172	0.0004	0.0008	"	0.200000	0.0009	85.7	70-130	4.23	20
Vanadium, total	0.185	0.0043	0.0080	"	0.200000	0.0051	89.9	70-130	5.69	20
Zinc, total	0.179	0.0174	0.0200	"	0.200000	0.0182	80.6	70-130	5.22	20

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GC1180 - EPA 200.2 Total ICP-MS

Post Spike (1GC1180-PS1)

Source: 1GC1696-01

Prepared: 03/22/23 Analyzed: 03/23/23

Antimony, total	0.0840			mg/L	0.0800000	0.0003	105	70-130			
Arsenic, total	0.0879			"	0.0800000	0.0039	105	70-130			
Barium, total	1.31			"	0.0800000	1.06	314	70-130			PS-4X
Beryllium, total	0.0917			"	0.0800000	0.00001	115	70-130			
Cadmium, total	0.0781			"	0.0800000	0.00005	97.5	70-130			
Chromium, total	0.0846			"	0.0800000	0.0011	104	70-130			
Cobalt, total	0.0886			"	0.0800000	0.0001	111	70-130			
Copper, total	0.0883			"	0.0800000	0.0082	100	70-130			
Lead, total	0.0810			"	0.0800000	0.0007	100	70-130			
Manganese, total	0.100			"	0.0800000	0.0139	108	70-130			
Molybdenum, total	0.0944			"	0.0800000	0.0003	118	70-130			
Nickel, total	0.0910			"	0.0800000	0.0043	108	70-130			
Selenium, total	0.0734			"	0.0800000	0.0003	91.4	70-130			
Silver, total	0.0859			"	0.0800000	0.0001	107	70-130			
Thallium, total	0.0784			"	0.0800000	0.0009	96.9	70-130			
Vanadium, total	0.0911			"	0.0800000	0.0050	108	70-130			
Zinc, total	0.0951			"	0.0800000	0.0179	96.6	70-130			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Certified Analyses included in this Report

Method/Matrix	Analyte	Certifications
200.7 in Water		
	Iron, total	SIA1X,KS-NT
	Magnesium, total	SIA1X,KS-NT
EPA 200.7 in Water		
	Aluminum, total	SIA1X,KS-NT
	Boron, total	SIA1X,KS-NT
EPA 200.8 in Water		
	Antimony, total	SIA1X,KS-NT
	Arsenic, total	SIA1X,KS-NT
	Barium, total	SIA1X,KS-NT
	Beryllium, total	SIA1X,KS-NT
	Cadmium, total	SIA1X,KS-NT
	Chromium, total	SIA1X,KS-NT
	Cobalt, total	SIA1X,KS-NT
	Copper, total	SIA1X,KS-NT
	Lead, total	SIA1X,KS-NT
	Manganese, total	SIA1X,KS-NT
	Molybdenum, total	SIA1X,KS-NT
	Nickel, total	SIA1X,KS-NT
	Selenium, total	SIA1X,KS-NT
	Silver, total	SIA1X,KS-NT
	Thallium, total	SIA1X,KS-NT
	Vanadium, total	SIA1X,KS-NT
	Zinc, total	SIA1X,KS-NT
EPA 410.4 in Water		
	COD, total	KS-NT,SIA1X
EPA 420.1 in Water		
	Phenols, total	KS-NT,SIA1X
EPA 624 in Water		

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

	2-Butanone (MEK)	SIA1X
	Chloroform	KS-NT,SIA1X
	Benzene	KS-NT,SIA1X
EPA 8315 in Water		
	Formaldehyde	SIA1X
EPA 9020 in Water		
	Total Organic Halogens (TOX)	KS-NT,SIA1X
EPA 9056 in Water		
	Fluoride	KS-NT,SIA1X
	Chloride	KS-NT,SIA1X
	Sulfate	KS-NT,SIA1X
SM 3112B in Water		
	Mercury, total	KS-NT,SIA1X
TIMBERLINE in Water		
	Nitrogen, Ammonia	SIA1X,KS-NT
USGS I-1750-85 in Water		
	Solids, total dissolved	KS-NT,SIA1X
USGS I-3765-85 in Water		
	Solids, total suspended	SIA1X,KS-NT

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2023
KS-NT	Kansas Department of Health and Environment (NELAP)	E-10287	10/31/2023
MO-KC	Missouri Department of Natural Resources	140	04/30/2023
SIA1X	Iowa Dept. of Natural Resources	95	02/01/2024

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Notes and Definitions

QS-01	The blank spike recovery and/or blank spike duplicate recovery were outside the established acceptance limits. Batch was accepted based on acceptable MS/MSD/RPD results.
QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration.
QM-14	The spike recovery was outside acceptance limits for the MS and/or MSD. However, all other QC was acceptable.
QM-07	The spike recovery and/or RPD was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
PS-4X	The spike recovery was outside of QC acceptance limits for the Post Spike due to analyte concentration at 4 times or greater the spike concentration.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Project Description

GW Monitoring

For:

Sherman Lundy

BMC Aggregates L.C.

101 BMC Drive

Elk Run Heights, IA 50707

A handwritten signature in black ink that reads "Heather Tisdale". The signature is written in a cursive, flowing style.

Heather Tisdale

Customer Relationship Specialist

Monday, November 20, 2023

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Keystone Laboratories - Newton. If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed above.

I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.

Microbac Laboratories, Inc.

600 East 17th Street South | Newton, IA 50208 | 641-792-8451 p | www.microbac.com



Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

BMC Aggregates L.C.

Project Name: GW Monitoring

Sherman Lundy
101 BMC Drive
Elk Run Heights, IA 50707

Project / PO Number: Sherman Lundy / Miller Creek Ar
Received: 10/19/2023
Reported: 11/20/2023

Sample Summary Report

<u>Sample Name</u>	<u>Laboratory ID</u>	<u>Client Matrix</u>	<u>Sample Type</u>	<u>Sample Begin</u>	<u>Sample Taken</u>	<u>Lab Received</u>
Well #1	1GJ1657-01	Water	GRAB		10/18/23 08:00	10/19/23 11:10
Well #2	1GJ1657-02	Water	GRAB		10/18/23 08:30	10/19/23 11:10
Well #3	1GJ1657-03	Water	GRAB		10/18/23 09:00	10/19/23 11:10
Well #4	1GJ1657-04	Water	GRAB		10/18/23 09:30	10/19/23 11:10
Upgradient Well	1GJ1657-05	Water	GRAB		10/18/23 10:00	10/19/23 11:10

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Analytical Testing Parameters

Client Sample ID: Well #1	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:00
Lab Sample ID: 1GJ1657-01	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: Dibromofluoromethane	93.9	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: 1,2-Dichloroethane-d4	96.2	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: Toluene-d8	96.5	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: 4-Bromofluorobenzene	99.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1349	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 1943	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 1943	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: 2-Fluorophenol	70.1	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: Phenol-d6	54.5	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: 2,4,6-Tribromophenol	103	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 1943	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1107	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK

Method: EPA 420.1									
Phenols, total	0.047	0.024	0.035	mg/L	1			11/01/23 1336	AKK

Method: EPA 9020									
Total Organic Halogens (TOX)	0.018	0.006	0.010	mg/L	1	TOX-3	11/09/23 0000	11/14/23 1207	LNH

Method: SM 2510B

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #1	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:00
Lab Sample ID: 1GJ1657-01	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Conductivity	589	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS
Method: TIMBERLINE									
Nitrogen, Ammonia	1.51	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1509	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	369	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	<1	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.9	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Chloride	9.8	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Sulfate	58.1	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.265	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Magnesium, total	30.9	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Arsenic, total	0.0015	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Barium, total	0.371	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Copper, total	0.0032	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Manganese, total	0.0055	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Molybdenum, total	0.0010	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Nickel, total	0.0013	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Selenium, total	<0.0011	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2300	RVV

Keystone Laboratories - Newton
 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Well #1	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:00
Lab Sample ID: 1GJ1657-01	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1706	JAR

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #2
Sample Matrix: Water
Lab Sample ID: 1GJ1657-02

Collected By: Sherman Lundy
Collection Date: 10/18/2023 8:30

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: Dibromofluoromethane	93.9	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: 1,2-Dichloroethane-d4	95.9	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: Toluene-d8	97.9	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: 4-Bromofluorobenzene	99.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Determination of Base/Neutral Extractable Compounds									
Method: EPA 625									
Pyridine	<13	13	13	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
Determination of Acid Extractable Compounds									
Method: EPA 625									
2-Methylphenol (o-Cresol)	<12.8	3.4	12.8	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
(3 & 4)-Methylphenol	<12.8	3.3	12.8	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: 2-Fluorophenol	70.9	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: Phenol-d6	63.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: 2,4,6-Tribromophenol	97.4	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Determination of Carbonyl Compounds									
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1126	EPP
Determination of Conventional Chemistry Parameters									
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.066	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	0.016	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	695	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #2	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:30
Lab Sample ID: 1GJ1657-02	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1510	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	481	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	8	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.7	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1303	MID
Chloride	12.4	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1303	MID
Sulfate	120	1.8	5.0	mg/L	5		10/27/23 0000	10/27/23 1736	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.573	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Magnesium, total	40.1	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Arsenic, total	0.0009	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Barium, total	0.0817	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Copper, total	0.0030	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Manganese, total	0.0107	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Molybdenum, total	<0.0006	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Nickel, total	0.0012	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Selenium, total	<0.0011	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Silver, total	0.0019	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2324	RVV

Keystone Laboratories - Newton
 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Well #2	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:30
Lab Sample ID: 1GJ1657-02	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1716	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #3	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:00
Lab Sample ID: 1GJ1657-03	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: Dibromofluoromethane	94.0	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: 1,2-Dichloroethane-d4	97.0	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: Toluene-d8	96.9	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: 4-Bromofluorobenzene	97.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1707	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2032	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2032	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: 2-Fluorophenol	69.6	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: Phenol-d6	51.5	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: 2,4,6-Tribromophenol	102	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2032	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1145	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.063	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	0.054	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	612	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #3	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:00
Lab Sample ID: 1GJ1657-03	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	0.12	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1515	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	400	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	10	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.6	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Chloride	23.8	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Sulfate	100	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.055	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Magnesium, total	30.8	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Arsenic, total	0.0009	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Barium, total	0.0957	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Copper, total	0.0051	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Manganese, total	0.0072	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Molybdenum, total	0.0028	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Nickel, total	0.0026	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Selenium, total	0.0014	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2342	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #3	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:00
Lab Sample ID: 1GJ1657-03	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1718	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #4	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: Dibromofluoromethane	92.2	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: 1,2-Dichloroethane-d4	96.3	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: Toluene-d8	97.8	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: 4-Bromofluorobenzene	99.2	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2056	EPP
Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2056	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: 2-Fluorophenol	73.9	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: Phenol-d6	62.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: 2,4,6-Tribromophenol	97.5	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2056	EPP
Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1204	EPP
Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.035	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	<0.010	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	672	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #4	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1516	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	459	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	36	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.3	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1340	MID
Chloride	20.0	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1340	MID
Sulfate	111	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1340	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	2.43	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Magnesium, total	26.1	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Method: EPA 200.7									
Aluminum, total	1.83	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Arsenic, total	0.0020	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Barium, total	0.109	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Beryllium, total	0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Chromium, total	0.0050	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Cobalt, total	0.0015	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Copper, total	0.0073	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Lead, total	0.0023	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Manganese, total	0.0678	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Molybdenum, total	0.0040	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Nickel, total	0.0061	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Selenium, total	0.0036	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Vanadium, total	0.0095	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2348	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #4	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1720	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Upgradient Well	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 10:00
Lab Sample ID: 1GJ1657-05	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: Dibromofluoromethane	93.4	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: 1,2-Dichloroethane-d4	97.2	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: Toluene-d8	96.6	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: 4-Bromofluorobenzene	98.3	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Determination of Base/Neutral Extractable Compounds									
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2121	EPP
Determination of Acid Extractable Compounds									
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2121	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: 2-Fluorophenol	82.5	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: Phenol-d6	73.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: 2,4,6-Tribromophenol	101	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2121	EPP
Determination of Carbonyl Compounds									
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1223	EPP
Determination of Conventional Chemistry Parameters									
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.082	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	<0.010	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	636	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Upgradient Well	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 10:00
Lab Sample ID: 1GJ1657-05	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1517	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	425	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	<1	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.3	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1358	MID
Chloride	35.0	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1358	MID
Sulfate	109	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1358	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	<0.047	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
Magnesium, total	20.8	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
Boron, total	0.058	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
Method: EPA 200.8									
Antimony, total	0.0009	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Arsenic, total	0.0006	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Barium, total	0.116	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Copper, total	0.0067	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Lead, total	0.0007	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Manganese, total	<0.0017	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Molybdenum, total	0.0063	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Nickel, total	0.0018	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Selenium, total	0.0035	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2354	RVV

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 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Upgradient Well	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 10:00
Lab Sample ID: 1GJ1657-05	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	0.0304	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1722	JAR

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CERTIFICATE OF ANALYSIS

1GJ1657

Batch Log Summary

Method	Batch	Laboratory ID	Client / Source ID
SM 3112B	1GJ1247	1GJ1247-BLK1	
		1GJ1247-BS1	
		1GJ1657-01	Well #1
		1GJ1247-MS1	1GJ1657-01
		1GJ1247-MSD1	1GJ1657-01
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
USGS I-1750-85	1GJ1274	1GJ1274-BS1	
		1GJ1274-DUP1	1GJ1657-01
		1GJ1657-05	Upgradient Well
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1274-BLK1	
USGS I-3765-85	1GJ1278	1GJ1657-02	Well #2
		1GJ1278-BS1	
		1GJ1657-01	Well #1
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1657-03	Well #3
		1GJ1278-BLK1	
		1GJ1278-DUP1	1GJ1652-01
EPA 8315	1GJ1279	1GJ1279-BLK1	
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1279-MS1	1GJ1657-01
		1GJ1279-MSD1	1GJ1657-01
Method	Batch	Laboratory ID	Client / Source ID

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CERTIFICATE OF ANALYSIS

1GJ1657

EPA 200.8	1GJ1310	1GJ1310-BLK1	
		1GJ1310-BLK1	
		1GJ1310-BS1	
		1GJ1310-BS1	
		1GJ1657-01	Well #1
		1GJ1657-01	Well #1
		1GJ1310-MS1	1GJ1657-01
		1GJ1310-MS1	1GJ1657-01
		1GJ1310-MSD1	1GJ1657-01
		1GJ1310-MSD1	1GJ1657-01
		1GJ1310-PS1	1GJ1657-01
		1GJ1310-PS1	1GJ1657-01
		1GJ1657-02	Well #2
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1657-05	Upgradient Well

Method	Batch	Laboratory ID	Client / Source ID
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EPA 625	1GJ1322	1GJ1322-BLK1	
		1GJ1322-BLK1	
		1GJ1322-BS1	
		1GJ1322-BS1	
		1GJ1322-BSD1	
		1GJ1322-BSD1	
		1GJ1322-SRM1	
		1GJ1322-SRM1	
		1GJ1657-01	Well #1
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1657-05	Upgradient Well

Method	Batch	Laboratory ID	Client / Source ID
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SM 2510B	1GJ1323	1GJ1323-DUP1	1GJ1770-01
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1GJ1657

SM 2510B	1GJ1323	1GJ1323-BLK1	
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-01	Well #1
		1GJ1657-05	Upgradient Well
		1GJ1323-MRL1	
		1GJ1657-02	Well #2
		1GJ1323-SRM1	

Method	Batch	Laboratory ID	Client / Source ID
EPA 200.7	1GJ1372	1GJ1372-BLK1	
		1GJ1372-BLK1	
200.7		1GJ1372-BLK1	
EPA 200.7		1GJ1372-BS1	
200.7		1GJ1372-BS1	
EPA 200.7		1GJ1372-BS1	
		1GJ1657-01	Well #1
		1GJ1657-01	Well #1
200.7		1GJ1657-01	Well #1
EPA 200.7		1GJ1372-MS1	1GJ1657-01
200.7		1GJ1372-MS1	1GJ1657-01
EPA 200.7		1GJ1372-MS1	1GJ1657-01
		1GJ1372-MSD1	1GJ1657-01
200.7		1GJ1372-MSD1	1GJ1657-01
EPA 200.7		1GJ1372-MSD1	1GJ1657-01
		1GJ1372-PS1	1GJ1657-01
200.7		1GJ1372-PS1	1GJ1657-01
EPA 200.7		1GJ1372-PS1	1GJ1657-01
200.7		1GJ1657-02	Well #2
EPA 200.7		1GJ1657-02	Well #2
		1GJ1657-02	Well #2
200.7		1GJ1657-03	Well #3
EPA 200.7		1GJ1657-03	Well #3
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-04	Well #4
200.7		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
EPA 200.7		1GJ1657-05	Upgradient Well
		1GJ1657-05	Upgradient Well
Method	Batch	Laboratory ID	Client / Source ID
TIMBERLINE	1GJ1471	1GJ1471-BLK1	

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CERTIFICATE OF ANALYSIS

1GJ1657

TIMBERLINE	1GJ1471	1GJ1471-BS1	
		1GJ1471-MS1	1GJ1650-02
		1GJ1471-MSD1	1GJ1650-02
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well

Method	Batch	Laboratory ID	Client / Source ID
EPA 624	1GJ1580	1GJ1580-BS1	
		1GJ1580-BSD1	
		1GJ1580-BLK1	
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1580-MS1	3GJ0143-01
		1GJ1580-MSD1	3GJ0143-01

Method	Batch	Laboratory ID	Client / Source ID
EPA 410.4	1GJ1709	1GJ1657-05	Upgradient Well
		1GJ1709-BS1	
		1GJ1709-BLK1	
		1GJ1709-MSD1	1GJ1657-01
		1GJ1657-04	Well #4
		1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1709-MS1	1GJ1657-01
		1GJ1657-01	Well #1

Method	Batch	Laboratory ID	Client / Source ID
EPA 9056	1GJ1774	1GJ1774-BLK1	
		1GJ1774-BLK1	
		1GJ1774-MRL1	
		1GJ1774-MRL1	
		1GJ1774-BS1	
		1GJ1774-BS1	
		1GJ1774-BSD1	
		1GJ1774-BSD1	
		1GJ1657-01	Well #1
		1GJ1657-01	Well #1
		1GJ1657-02	Well #2

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CERTIFICATE OF ANALYSIS

1GJ1657

EPA 9056	1GJ1774	1GJ1657-02	Well #2
		1GJ1657-03	Well #3
		1GJ1657-03	Well #3
		1GJ1657-04	Well #4
		1GJ1657-04	Well #4
		1GJ1657-05	Upgradient Well
		1GJ1657-05	Upgradient Well
		1GJ1774-BLK2	
		1GJ1774-BLK2	
		1GJ1774-MS1	1GJ2051-01
		1GJ1774-MS1	1GJ2051-01
		1GJ1774-MSD1	1GJ2051-01
		1GJ1774-MSD1	1GJ2051-01
		1GJ1657-02	Well #2
		1GJ1774-BS2	
		1GJ1774-BS2	
		1GJ1774-BSD2	
		1GJ1774-BSD2	
		1GJ1774-MS2	1GJ2199-02
		1GJ1774-MS2	1GJ2199-02
		1GJ1774-MSD2	1GJ2199-02
		1GJ1774-MSD2	1GJ2199-02
		1GJ1774-BLK3	
		1GJ1774-BLK3	

Method	Batch	Laboratory ID	Client / Source ID
EPA 420.1	1GK0046	1GJ1657-02	Well #2
		1GK0046-BLK1	
		1GJ1657-04	Well #4
		1GJ1657-03	Well #3
		1GJ1657-01	Well #1
		1GK0046-MSD1	1GJ1657-01
		1GK0046-MS1	1GJ1657-01
		1GJ1657-05	Upgradient Well
		1GK0046-BS1	

Method	Batch	Laboratory ID	Client / Source ID
EPA 9020	1GK0635	1GJ1657-04	Well #4
		1GK0635-SRM1	
		1GK0635-SRM2	
		1GK0635-SRM3	
		1GJ1657-05	Upgradient Well
		1GJ1657-02	Well #2

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CERTIFICATE OF ANALYSIS

1GJ1657

EPA 9020

1GK0635

1GJ1657-03

Well #3

1GK0635-BLK1

1GK0635-BS1

1GK0635-BSD1

1GJ1657-01

Well #1

Batch Quality Control Summary: Keystone Laboratories - Newton

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1580 - EPA 5030B - EPA 624										
Blank (1GJ1580-BLK1)										
Prepared: 10/25/23 00:00 Analyzed: 10/25/23 09:33										
2-Butanone (MEK)	<10.0	10.0	ug/L							
Chloroform	<1.0	1.0	ug/L							
Benzene	<1.0	1.0	ug/L							
Surrogate: Dibromofluoromethane	46.3		ug/L	50.4		92.0	79-129			
Surrogate: 1,2-Dichloroethane-d4	47.6		ug/L	50.4		94.5	66-134			
Surrogate: Toluene-d8	48.8		ug/L	50.2		97.2	91-113			
Surrogate: 4-Bromofluorobenzene	49.4		ug/L	50.4		98.0	83-112			
LCS (1GJ1580-BS1)										
Prepared: 10/25/23 00:00 Analyzed: 10/25/23 08:24										
2-Butanone (MEK)	108.1	10.0	ug/L	103		105	44-158			
Chloroform	47.93	1.0	ug/L	50.0		95.9	76-132			
Benzene	49.03	1.0	ug/L	50.0		98.1	77-130			
Surrogate: Dibromofluoromethane	47.2		ug/L	50.4		93.8	79-129			
Surrogate: 1,2-Dichloroethane-d4	47.2		ug/L	50.4		93.7	66-134			
Surrogate: Toluene-d8	50.1		ug/L	50.2		99.6	91-113			
Surrogate: 4-Bromofluorobenzene	50.1		ug/L	50.4		99.4	83-112			
LCS Dup (1GJ1580-BSD1)										
Prepared: 10/25/23 00:00 Analyzed: 10/25/23 08:47										
2-Butanone (MEK)	107.4	10.0	ug/L	103		104	44-158	0.668	25	
Chloroform	47.62	1.0	ug/L	50.0		95.2	76-132	0.649	26	
Benzene	48.14	1.0	ug/L	50.0		96.3	77-130	1.83	27	
Surrogate: Dibromofluoromethane	47.5		ug/L	50.4		94.3	79-129			
Surrogate: 1,2-Dichloroethane-d4	47.4		ug/L	50.4		94.0	66-134			
Surrogate: Toluene-d8	49.6		ug/L	50.2		98.7	91-113			
Surrogate: 4-Bromofluorobenzene	50.0		ug/L	50.4		99.3	83-112			
Matrix Spike (1GJ1580-MS1)										
Source: 3GJ0143-01 Prepared: 10/25/23 00:00 Analyzed: 10/25/23 19:01										
2-Butanone (MEK)	1022	100	ug/L	1030	ND	99.0	48-169			
Chloroform	470.2	10.0	ug/L	500	5.03	93.0	75-133			
Benzene	480.7	10.0	ug/L	500	ND	96.1	79-128			
Surrogate: Dibromofluoromethane	469		ug/L	504		93.1	79-129			
Surrogate: 1,2-Dichloroethane-d4	472		ug/L	504		93.6	66-134			
Surrogate: Toluene-d8	501		ug/L	502		99.6	91-113			
Surrogate: 4-Bromofluorobenzene	497		ug/L	504		98.5	83-112			
Matrix Spike Dup (1GJ1580-MSD1)										
Source: 3GJ0143-01 Prepared: 10/25/23 00:00 Analyzed: 10/25/23 19:23										
2-Butanone (MEK)	1065	100	ug/L	1030	ND	103	48-169	4.08	17	

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CERTIFICATE OF ANALYSIS

1GJ1657

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GJ1580 - EPA 5030B - EPA 624

Matrix Spike Dup (1GJ1580-MSD1)		Source: 3GJ0143-01		Prepared: 10/25/23 00:00 Analyzed: 10/25/23 19:23						
Chloroform	472.0	10.0	ug/L	500	5.03	93.4	75-133	0.382	16	
Benzene	469.3	10.0	ug/L	500	ND	93.9	79-128	2.40	12	
Surrogate: Dibromofluoromethane	477		ug/L	504		94.7	79-129			
Surrogate: 1,2-Dichloroethane-d4	472		ug/L	504		93.7	66-134			
Surrogate: Toluene-d8	497		ug/L	502		99.0	91-113			
Surrogate: 4-Bromofluorobenzene	496		ug/L	504		98.4	83-112			

Determination of Base/Neutral Extractable Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GJ1322 - EPA 625 BNA - EPA 625

Blank (1GJ1322-BLK1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 16:27						
Pyridine	<10	10	ug/L							
LCS (1GJ1322-BS1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 16:51						
Pyridine	15.0	10	ug/L	40.0		37.4	13-127			
LCS Dup (1GJ1322-BSD1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 17:16						
Pyridine	14.1	10	ug/L	40.0		35.3	13-127	5.84	30	
Reference (1GJ1322-SRM1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 17:40						
Pyridine	28.5	10	ug/L	40.0		71.3	80-120			QR-06

Determination of Acid Extractable Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GJ1322 - EPA 625 BNA - EPA 625

Blank (1GJ1322-BLK1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 16:27						
2-Methylphenol (o-Cresol)	<10.0	10.0	ug/L							
(3 & 4)-Methylphenol	<10.0	10.0	ug/L							
Surrogate: 2-Fluorophenol	52.0		ug/L	60.6		85.9	19-139			
Surrogate: Phenol-d6	47.5		ug/L	61.9		76.8	14-154			
Surrogate: 2,4,6-Tribromophenol	66.2		ug/L	62.2		106	21-151			
LCS (1GJ1322-BS1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 16:51						
2-Methylphenol (o-Cresol)	31.7	10.0	ug/L	40.0		79.2	50-138			
(3 & 4)-Methylphenol	32.9	10.0	ug/L	40.0		82.4	56-130			
Surrogate: 2-Fluorophenol	47.7		ug/L	60.6		78.7	19-139			
Surrogate: Phenol-d6	43.4		ug/L	61.9		70.1	14-154			
Surrogate: 2,4,6-Tribromophenol	70.2		ug/L	62.2		113	21-151			
LCS Dup (1GJ1322-BSD1)				Prepared: 10/23/23 11:14 Analyzed: 10/31/23 17:16						
2-Methylphenol (o-Cresol)	30.8	10.0	ug/L	40.0		77.0	50-138	2.72	24	

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Determination of Acid Extractable Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1322 - EPA 625 BNA - EPA 625										
LCS Dup (1GJ1322-BSD1) Prepared: 10/23/23 11:14 Analyzed: 10/31/23 17:16										
(3 & 4)-Methylphenol	31.8	10.0	ug/L	40.0		79.6	56-130	3.36	26	
Surrogate: 2-Fluorophenol	43.5		ug/L	60.6		71.8	19-139			
Surrogate: Phenol-d6	39.6		ug/L	61.9		64.0	14-154			
Surrogate: 2,4,6-Tribromophenol	67.5		ug/L	62.2		108	21-151			
Reference (1GJ1322-SRM1) Prepared: 10/23/23 11:14 Analyzed: 10/31/23 17:40										
2-Methylphenol (o-Cresol)	31.4	10.0	ug/L	40.0		78.5	80-120			QR-06
(3 & 4)-Methylphenol	32.5	10.0	ug/L	40.0		81.2	80-120			
Surrogate: 2-Fluorophenol	54.8		ug/L	60.6		90.4	19-139			
Surrogate: Phenol-d6	52.1		ug/L	61.9		84.2	14-154			
Surrogate: 2,4,6-Tribromophenol	69.3		ug/L	62.2		111	21-151			
Determination of Carbonyl Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1279 - EPA 8315 Aldehydes - EPA 8315										
Blank (1GJ1279-BLK1) Prepared: 10/20/23 13:11 Analyzed: 10/23/23 10:48										
Formaldehyde	<10.0	10.0	ug/L							
Matrix Spike (1GJ1279-MS1) Source: 1GJ1657-01 Prepared: 10/20/23 13:11 Analyzed: 10/23/23 13:02										
Formaldehyde	305.0	10.0	ug/L	500	ND	61.0	48-148			
Matrix Spike Dup (1GJ1279-MSD1) Source: 1GJ1657-01 Prepared: 10/20/23 13:11 Analyzed: 10/23/23 13:21										
Formaldehyde	506.4	10.0	ug/L	500	ND	101	48-148	49.6	30	QR-02
Determination of Conventional Chemistry Parameters	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1274 - Wet Chem Preparation - USGS I-1750-85										
Blank (1GJ1274-BLK1) Prepared: 10/20/23 12:54 Analyzed: 10/23/23 08:25										
Total Dissolved Solids (TDS)	<5	5	mg/L							
LCS (1GJ1274-BS1) Prepared: 10/20/23 12:54 Analyzed: 10/23/23 08:25										
Total Dissolved Solids (TDS)	97	5	mg/L	100		97.3	71-114			
Duplicate (1GJ1274-DUP1) Source: 1GJ1657-01 Prepared: 10/20/23 12:54 Analyzed: 10/23/23 08:25										
Total Dissolved Solids (TDS)	381	5	mg/L		369			3.20	30	
Batch 1GJ1278 - Wet Chem Preparation - USGS I-3765-85										
Blank (1GJ1278-BLK1) Prepared: 10/20/23 13:05 Analyzed: 10/23/23 11:20										
Total Suspended Solids (TSS)	<1	1	mg/L							
LCS (1GJ1278-BS1) Prepared: 10/20/23 13:05 Analyzed: 10/23/23 11:20										
Total Suspended Solids (TSS)	13.1	1	mg/L	15.0		87.3	74-114			

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Determination of Conventional Chemistry Parameters	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1278 - Wet Chem Preparation - USGS I-3765-85										
Duplicate (1GJ1278-DUP1) Source: 1GJ1652-01 Prepared: 10/20/23 13:05 Analyzed: 10/23/23 11:20										
Total Suspended Solids (TSS)	73.0	1	mg/L		74.0			1.36	30	
Batch 1GJ1323 - Wet Chem Preparation - SM 2510B										
Blank (1GJ1323-BLK1) Prepared: 10/23/23 11:22 Analyzed: 10/23/23 13:25										
Conductivity	<2.0	2.0	uS/cm							
Duplicate (1GJ1323-DUP1) Source: 1GJ1770-01 Prepared: 10/23/23 11:22 Analyzed: 10/23/23 13:25										
Conductivity	560	2.0	uS/cm		560			0.107	10	
Reference (1GJ1323-SRM1) Prepared: 10/23/23 11:22 Analyzed: 10/23/23 13:25										
Conductivity	242	2.0	uS/cm	250		96.6	90-110			
Batch 1GJ1471 - General Prep HPLC/IC - TIMBERLINE										
Blank (1GJ1471-BLK1) Prepared: 10/24/23 16:22 Analyzed: 10/26/23 14:52										
Nitrogen, Ammonia	<0.10	0.10	mg/L							
LCS (1GJ1471-BS1) Prepared: 10/24/23 16:22 Analyzed: 10/26/23 14:53										
Nitrogen, Ammonia	4.85	0.10	mg/L	5.00		97.0	90-114			
Matrix Spike (1GJ1471-MS1) Source: 1GJ1650-02 Prepared: 10/24/23 16:22 Analyzed: 10/26/23 14:55										
Nitrogen, Ammonia	5.07	0.10	mg/L	5.00	ND	101	84-115			
Matrix Spike Dup (1GJ1471-MSD1) Source: 1GJ1650-02 Prepared: 10/24/23 16:22 Analyzed: 10/26/23 14:56										
Nitrogen, Ammonia	5.10	0.10	mg/L	5.00	ND	102	84-115	0.612	20	
Batch 1GJ1709 - Wet Chem Preparation - EPA 410.4										
Blank (1GJ1709-BLK1) Prepared: 10/28/23 18:28 Analyzed: 11/01/23 15:33										
COD, total	<20	20	mg/L							
LCS (1GJ1709-BS1) Prepared: 10/28/23 18:28 Analyzed: 11/01/23 15:33										
COD, total	156	20	mg/L	146		107	90-110			
Matrix Spike (1GJ1709-MS1) Source: 1GJ1657-01 Prepared: 10/28/23 18:28 Analyzed: 11/01/23 15:33										
COD, total	421	40	mg/L	292	ND	144	90-110			QM-07
Matrix Spike Dup (1GJ1709-MSD1) Source: 1GJ1657-01 Prepared: 10/28/23 18:28 Analyzed: 11/01/23 15:33										
COD, total	296	40	mg/L	292	ND	101	90-110	34.7	10	QM-07
Batch 1GK0046 - Wet Chem Preparation - EPA 420.1										
Blank (1GK0046-BLK1) Prepared & Analyzed: 11/01/23 13:36										
Phenols, total	<0.035	0.035	mg/L							
LCS (1GK0046-BS1) Prepared & Analyzed: 11/01/23 13:36										
Phenols, total	0.361	0.035	mg/L	0.400		90.2	62-110			
Matrix Spike (1GK0046-MS1) Source: 1GJ1657-01 Prepared & Analyzed: 11/01/23 13:36										
Phenols, total	0.370	0.035	mg/L	0.400	0.0473	80.8	57-124			

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Determination of	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Determination of Conventional Chemistry Parameters										
Batch 1GK0046 - Wet Chem Preparation - EPA 420.1										
Matrix Spike Dup (1GK0046-MSD1) Source: 1GJ1657-01 Prepared & Analyzed: 11/01/23 13:36										
Phenols, total	0.462	0.035	mg/L	0.400	0.0473	104	57-124	22.1	21	QR-02
Batch 1GK0635 - TOX/TX/EOX - EPA 9020										
Blank (1GK0635-BLK1) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	<0.010	0.010	mg/L							
LCS (1GK0635-BS1) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	0.1220	0.010	mg/L	0.121		101	76-114			
LCS Dup (1GK0635-BSD1) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	0.1126	0.010	mg/L	0.121		93.4	76-114	7.99	18	
Reference (1GK0635-SRM1) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	0.1132	0.010	mg/L	0.111		102	90-110			
Reference (1GK0635-SRM2) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	0.1081	0.010	mg/L	0.111		97.3	90-110			
Reference (1GK0635-SRM3) Prepared: 11/09/23 00:00 Analyzed: 11/10/23 10:11										
Total Organic Halogens (TOX)	0.1094	0.010	mg/L	0.111		98.5	90-110			
Determination of Inorganic Anions										
Batch 1GJ1774 - General Prep HPLC/IC - EPA 9056										
Blank (1GJ1774-BLK1) Prepared: 10/27/23 00:00 Analyzed: 10/27/23 10:20										
Fluoride	<0.1	0.1	mg/L							
Chloride	<0.3	0.3	mg/L							
Sulfate	<0.4	0.4	mg/L							
Blank (1GJ1774-BLK2) Prepared: 10/27/23 00:00 Analyzed: 10/27/23 14:34										
Fluoride	<0.1	0.1	mg/L							
Chloride	<0.3	0.3	mg/L							
Sulfate	<0.4	0.4	mg/L							
Blank (1GJ1774-BLK3) Prepared: 10/27/23 00:00 Analyzed: 10/28/23 01:28										
Fluoride	<0.1	0.1	mg/L							
Chloride	<0.3	0.3	mg/L							
Sulfate	<0.4	0.4	mg/L							
LCS (1GJ1774-BS1) Prepared: 10/27/23 00:00 Analyzed: 10/27/23 10:56										
Fluoride	1.08	0.1	mg/L	1.19		91.1	80-120			
Chloride	14.73	0.3	mg/L	15.2		97.0	80-120			
Sulfate	34.21	0.4	mg/L	34.1		100	80-120			
LCS (1GJ1774-BS2) Prepared: 10/27/23 00:00 Analyzed: 10/27/23 21:14										
Fluoride	1.08	0.1	mg/L	1.19		90.5	80-120			
Chloride	14.89	0.3	mg/L	15.2		98.1	80-120			

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Determination of Inorganic Anions	Result	MDL	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1774 - General Prep HPLC/IC - EPA 9056											
Prepared: 10/27/23 00:00 Analyzed: 10/27/23 21:14											
LCS (1GJ1774-BS2)											
Sulfate	34.18	0.4	1.0	mg/L	34.1		100	80-120			
Prepared: 10/27/23 00:00 Analyzed: 10/27/23 11:15											
LCS Dup (1GJ1774-BSD1)											
Fluoride	1.08		0.1	mg/L	1.19		90.5	80-120	0.647	10	
Chloride	14.74	0.3	1.0	mg/L	15.2		97.1	80-120	0.0882	10	
Sulfate	34.29	0.4	1.0	mg/L	34.1		101	80-120	0.231	10	
Prepared: 10/27/23 00:00 Analyzed: 10/27/23 21:32											
LCS Dup (1GJ1774-BSD2)											
Fluoride	1.08		0.1	mg/L	1.19		90.4	80-120	0.0928	10	
Chloride	14.86	0.3	1.0	mg/L	15.2		97.9	80-120	0.229	10	
Sulfate	34.07	0.4	1.0	mg/L	34.1		100	80-120	0.349	10	
Prepared: 10/27/23 00:00 Analyzed: 10/27/23 16:59											
Matrix Spike (1GJ1774-MS1) Source: 1GJ2051-01											
Fluoride	1.24		0.1	mg/L	1.19	ND	104	77-121			
Chloride	15.05	0.3	1.0	mg/L	15.2	ND	99.1	81-116			
Sulfate	34.33	0.4	1.0	mg/L	34.1	ND	101	87-113			
Prepared: 10/27/23 00:00 Analyzed: 10/28/23 00:33											
Matrix Spike (1GJ1774-MS2) Source: 1GJ2199-02											
Fluoride	13.28		1.0	mg/L	11.9	1.40	99.7	77-121			
Chloride	444.2	3.4	10.0	mg/L	152	276.4	111	81-116			
Sulfate	718.6	3.6	10.0	mg/L	341	356.3	106	87-113			
Prepared: 10/27/23 00:00 Analyzed: 10/27/23 17:18											
Matrix Spike Dup (1GJ1774-MSD1) Source: 1GJ2051-01											
Fluoride	1.24		0.1	mg/L	1.19	ND	104	77-121	0.404	10	
Chloride	14.96	0.3	1.0	mg/L	15.2	ND	98.5	81-116	0.620	10	
Sulfate	34.26	0.4	1.0	mg/L	34.1	ND	101	87-113	0.204	10	
Prepared: 10/27/23 00:00 Analyzed: 10/28/23 00:52											
Matrix Spike Dup (1GJ1774-MSD2) Source: 1GJ2199-02											
Fluoride	12.98		1.0	mg/L	11.9	1.40	97.2	77-121	2.28	10	
Chloride	439.5	3.4	10.0	mg/L	152	276.4	107	81-116	1.05	10	
Sulfate	722.2	3.6	10.0	mg/L	341	356.3	107	87-113	0.500	10	
Determination of Total Metals	Result	MDL	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1247 - EPA 7470A Hg Water - SM 3112B											
Prepared: 10/20/23 08:44 Analyzed: 10/20/23 17:02											
Blank (1GJ1247-BLK1)											
Mercury, total	<0.00013	0.00013	0.00020	mg/L							
Prepared: 10/20/23 08:44 Analyzed: 10/20/23 17:04											
LCS (1GJ1247-BS1)											
Mercury, total	0.00243	0.00013	0.00020	mg/L	0.00250		97.3	87-118			
Prepared: 10/20/23 08:44 Analyzed: 10/20/23 17:12											
Matrix Spike (1GJ1247-MS1) Source: 1GJ1657-01											
Mercury, total	0.00251	0.00013	0.00020	mg/L	0.00250	ND	101	62-131			
Prepared: 10/20/23 08:44 Analyzed: 10/20/23 17:14											
Matrix Spike Dup (1GJ1247-MSD1) Source: 1GJ1657-01											
Mercury, total	0.00230	0.00013	0.00020	mg/L	0.00250	ND	92.1	62-131	8.80	17	
Batch 1GJ1310 - EPA 200.2 Total ICP-MS - EPA 200.8											

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Determination of Total Metals	Result	MDL	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1310 - EPA 200.2 Total ICP-MS - EPA 200.8											
Blank (1GJ1310-BLK1) Prepared: 10/23/23 09:37 Analyzed: 10/23/23 22:30											
Antimony, total	<0.0008	0.0008	0.0020	mg/L							
Arsenic, total	<0.0006	0.0006	0.0020	mg/L							
Barium, total	<0.0002	0.0002	0.0020	mg/L							
Beryllium, total	<0.0001	0.0001	0.0020	mg/L							
Cadmium, total	<0.00008	0.00008	0.0002	mg/L							
Chromium, total	<0.0007	0.0007	0.0020	mg/L							
Cobalt, total	<0.0005	0.0005	0.0020	mg/L							
Copper, total	<0.0008	0.0008	0.0020	mg/L							
Lead, total	<0.0005	0.0005	0.0008	mg/L							
Manganese, total	<0.0017	0.0017	0.0040	mg/L							
Molybdenum, total	<0.0006	0.0006	0.0020	mg/L							
Nickel, total	<0.0007	0.0007	0.0040	mg/L							
Selenium, total	<0.0011	0.0011	0.0040	mg/L							
Silver, total	<0.0015	0.0015	0.0020	mg/L							
Thallium, total	<0.0004	0.0004	0.0008	mg/L							
Vanadium, total	<0.0043	0.0043	0.0080	mg/L							
Zinc, total	<0.0174	0.0174	0.0200	mg/L							
LCS (1GJ1310-BS1) Prepared: 10/23/23 09:37 Analyzed: 10/23/23 22:36											
Antimony, total	0.0952	0.0008	0.0020	mg/L	0.100		95.2	85-115			
Arsenic, total	0.0952	0.0006	0.0020	mg/L	0.100		95.2	85-115			
Barium, total	0.102	0.0002	0.0020	mg/L	0.100		102	85-115			
Beryllium, total	0.0933	0.0001	0.0020	mg/L	0.100		93.3	85-115			
Cadmium, total	0.0945	0.00008	0.0002	mg/L	0.100		94.5	85-115			
Chromium, total	0.0947	0.0007	0.0020	mg/L	0.100		94.7	85-115			
Cobalt, total	0.0973	0.0005	0.0020	mg/L	0.100		97.3	85-115			
Copper, total	0.0954	0.0008	0.0020	mg/L	0.100		95.4	85-115			
Lead, total	0.0975	0.0005	0.0008	mg/L	0.100		97.5	85-115			
Manganese, total	0.0936	0.0017	0.0040	mg/L	0.100		93.6	85-115			
Molybdenum, total	0.0975	0.0006	0.0020	mg/L	0.100		97.5	85-115			
Nickel, total	0.0964	0.0007	0.0040	mg/L	0.100		96.4	85-115			
Selenium, total	0.0920	0.0011	0.0040	mg/L	0.100		92.0	85-115			
Silver, total	0.104	0.0015	0.0020	mg/L	0.100		104	85-115			
Thallium, total	0.0964	0.0004	0.0008	mg/L	0.100		96.4	85-115			
Vanadium, total	0.0971	0.0043	0.0080	mg/L	0.100		97.1	85-115			
Zinc, total	0.0938	0.0174	0.0200	mg/L	0.100		93.8	85-115			
Matrix Spike (1GJ1310-MS1) Source: 1GJ1657-01 Prepared: 10/23/23 09:37 Analyzed: 10/23/23 23:06											
Antimony, total	0.0977	0.0008	0.0020	mg/L	0.100	ND	97.7	70-130			
Arsenic, total	0.0970	0.0006	0.0020	mg/L	0.100	0.0015	95.5	70-130			
Barium, total	0.460	0.0002	0.0020	mg/L	0.100	0.371	88.9	70-130			
Beryllium, total	0.0936	0.0001	0.0020	mg/L	0.100	ND	93.6	70-130			
Cadmium, total	0.0958	0.00008	0.0002	mg/L	0.100	ND	95.8	70-130			
Chromium, total	0.0936	0.0007	0.0020	mg/L	0.100	ND	93.6	70-130			
Cobalt, total	0.0942	0.0005	0.0020	mg/L	0.100	ND	94.2	70-130			

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Determination of Total Metals	Result	MDL	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ1310 - EPA 200.2 Total ICP-MS - EPA 200.8											
Matrix Spike (1GJ1310-MS1)		Source: 1GJ1657-01			Prepared: 10/23/23 09:37 Analyzed: 10/23/23 23:06						
Copper, total	0.0933	0.0008	0.0020	mg/L	0.100	0.0032	90.1	70-130			
Lead, total	0.104	0.0005	0.0008	mg/L	0.100	ND	104	70-130			
Manganese, total	0.0954	0.0017	0.0040	mg/L	0.100	0.0055	90.0	70-130			
Molybdenum, total	0.106	0.0006	0.0020	mg/L	0.100	0.0010	105	70-130			
Nickel, total	0.0947	0.0007	0.0040	mg/L	0.100	0.0013	93.4	70-130			
Selenium, total	0.0935	0.0011	0.0040	mg/L	0.100	ND	93.5	70-130			
Silver, total	0.104	0.0015	0.0020	mg/L	0.100	ND	104	70-130			
Thallium, total	0.0961	0.0004	0.0008	mg/L	0.100	ND	96.1	70-130			
Vanadium, total	0.0984	0.0043	0.0080	mg/L	0.100	ND	98.4	70-130			
Zinc, total	0.0974	0.0174	0.0200	mg/L	0.100	ND	97.4	70-130			
Matrix Spike Dup (1GJ1310-MSD1)		Source: 1GJ1657-01			Prepared: 10/23/23 09:37 Analyzed: 10/23/23 23:12						
Antimony, total	0.101	0.0008	0.0020	mg/L	0.100	ND	101	70-130	2.88	20	
Arsenic, total	0.100	0.0006	0.0020	mg/L	0.100	0.0015	98.7	70-130	3.28	20	
Barium, total	0.486	0.0002	0.0020	mg/L	0.100	0.371	115	70-130	5.50	20	
Beryllium, total	0.0969	0.0001	0.0020	mg/L	0.100	ND	96.9	70-130	3.44	20	
Cadmium, total	0.0992	0.00008	0.0002	mg/L	0.100	ND	99.2	70-130	3.52	20	
Chromium, total	0.0962	0.0007	0.0020	mg/L	0.100	ND	96.2	70-130	2.71	20	
Cobalt, total	0.0966	0.0005	0.0020	mg/L	0.100	ND	96.6	70-130	2.44	20	
Copper, total	0.0959	0.0008	0.0020	mg/L	0.100	0.0032	92.7	70-130	2.78	20	
Lead, total	0.0966	0.0005	0.0008	mg/L	0.100	ND	96.6	70-130	6.99	20	
Manganese, total	0.0988	0.0017	0.0040	mg/L	0.100	0.0055	93.3	70-130	3.44	20	
Molybdenum, total	0.107	0.0006	0.0020	mg/L	0.100	0.0010	106	70-130	1.27	20	
Nickel, total	0.0952	0.0007	0.0040	mg/L	0.100	0.0013	94.0	70-130	0.558	20	
Selenium, total	0.0970	0.0011	0.0040	mg/L	0.100	ND	97.0	70-130	3.75	20	
Silver, total	0.107	0.0015	0.0020	mg/L	0.100	ND	107	70-130	3.41	20	
Thallium, total	0.0976	0.0004	0.0008	mg/L	0.100	ND	97.6	70-130	1.50	20	
Vanadium, total	0.101	0.0043	0.0080	mg/L	0.100	ND	101	70-130	3.05	20	
Zinc, total	0.0969	0.0174	0.0200	mg/L	0.100	ND	96.9	70-130	0.545	20	
Post Spike (1GJ1310-PS1)		Source: 1GJ1657-01			Prepared: 10/23/23 09:37 Analyzed: 10/23/23 23:18						
Antimony, total	0.0825			mg/L	0.0800	0.0002	103	70-130			
Arsenic, total	0.0812			mg/L	0.0800	0.0015	99.6	70-130			
Barium, total	0.456			mg/L	0.0800	0.363	116	70-130			
Beryllium, total	0.0792			mg/L	0.0800	0.000004	99.1	70-130			
Cadmium, total	0.0804			mg/L	0.0800	-0.000001	101	70-130			
Chromium, total	0.0785			mg/L	0.0800	0.0002	97.8	70-130			
Cobalt, total	0.0795			mg/L	0.0800	0.00005	99.4	70-130			
Copper, total	0.0793			mg/L	0.0800	0.0031	95.2	70-130			
Lead, total	0.0795			mg/L	0.0800	0.0001	99.2	70-130			
Manganese, total	0.0821			mg/L	0.0800	0.0054	96.0	70-130			
Molybdenum, total	0.0870			mg/L	0.0800	0.0010	108	70-130			
Nickel, total	0.0808			mg/L	0.0800	0.0012	99.5	70-130			
Selenium, total	0.0739			mg/L	0.0800	0.0005	91.7	70-130			
Silver, total	0.0863			mg/L	0.0800	0.0011	106	70-130			

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Determination of Total Metals	Result	MDL	RL	Units	Spike Level	Source Result	%REC	Limit	RPD	RPD Limit	Notes
Batch 1GJ1310 - EPA 200.2 Total ICP-MS - EPA 200.8											
Post Spike (1GJ1310-PS1) Source: 1GJ1657-01 Prepared: 10/23/23 09:37 Analyzed: 10/23/23 23:18											
Thallium, total	0.0811			mg/L	0.0800	0.00004	101	70-130			
Vanadium, total	0.0852			mg/L	0.0800	0.0021	104	70-130			
Zinc, total	0.0809			mg/L	0.0800	0.0052	94.6	70-130			
Batch 1GJ1372 - EPA 200.2 Total ICP-OES (200.7) - EPA 200.7											
Blank (1GJ1372-BLK1) Prepared: 10/24/23 07:55 Analyzed: 10/25/23 17:04											
Aluminum, total	<0.050		0.050	mg/L							
Boron, total	<0.056	0.056	0.100	mg/L							
Iron, total	<0.047	0.047	0.100	mg/L							
Magnesium, total	<0.06	0.06	0.10	mg/L							
LCS (1GJ1372-BS1) Prepared: 10/24/23 07:55 Analyzed: 10/25/23 17:10											
Aluminum, total	2.35		0.050	mg/L	2.20		107	85-115			
Boron, total	0.214	0.056	0.100	mg/L	0.200		107	85-115			
Iron, total	2.47	0.047	0.100	mg/L	2.20		112	85-115			
Magnesium, total	2.37	0.06	0.10	mg/L	2.20		108	85-115			
Matrix Spike (1GJ1372-MS1) Source: 1GJ1657-01 Prepared: 10/24/23 07:55 Analyzed: 10/25/23 17:22											
Aluminum, total	2.39		0.050	mg/L	2.20	0.0387	107	70-130			
Boron, total	0.247	0.056	0.100	mg/L	0.200	ND	123	70-130			
Iron, total	2.72	0.047	0.100	mg/L	2.20	0.265	112	70-130			
Magnesium, total	34.7	0.06	0.10	mg/L	2.20	30.9	172	70-130			QM-4X
Matrix Spike Dup (1GJ1372-MSD1) Source: 1GJ1657-01 Prepared: 10/24/23 07:55 Analyzed: 10/25/23 17:27											
Aluminum, total	2.42		0.050	mg/L	2.20	0.0387	108	70-130	1.01	20	
Boron, total	0.242	0.056	0.100	mg/L	0.200	ND	121	70-130	1.94	20	
Iron, total	2.69	0.047	0.100	mg/L	2.20	0.265	110	70-130	1.20	20	
Magnesium, total	33.9	0.06	0.10	mg/L	2.20	30.9	136	70-130	2.31	20	QM-4X
Post Spike (1GJ1372-PS1) Source: 1GJ1657-01 Prepared: 10/24/23 07:55 Analyzed: 10/25/23 17:33											
Aluminum, total	8.82			mg/L	8.80	0.0387	99.8	85-115			
Boron, total	0.848			mg/L	0.800	0.0300	102	85-115			
Iron, total	9.39			mg/L	8.80	0.265	104	85-115			
Magnesium, total	39.8			mg/L	8.80	30.9	101	85-115			



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

Accounts Payable
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: No

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
-001	Well #1	Water	GRAB	10/18/23	8 AM	12	624@benzene 624@nick 625@pyridine 8315@Formaldehyde ag-i-200.8 as-i-200.8 be-i-200.8 cd-i-200.8 cod-i-410.4 cr-i-200.8 f-9056 hg-i-3112-low mn-i-200.8 uh3-umberline pb-i-200.8 sb-i-200.8 so4-9056-w ti-i-200.8	624@chloroform 624-base-analysis 625-126 9020-100 al-i-200.7 ba-i-200.8 b-i-200.7 cl-9056-w co-i-200.8 ci-i-200.8 fe-i-200.7 mg-i-200.7 mo-i-200.8 ni-i-200.8 phenol-i-420.1 se-i-200.8 ids-i-1750-85 iss-i-3765-85	OL
						add →	Conductivity - TT		

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By TTTome Date/Time 10/18/23 12:25

Relinquished By EE-CDM Date/Time 10/19/23 11:10

Received for Lab By Jeho M Mung Date/Time 10/19/23 11:10

Remarks:



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Eik Run Heights, IA 50707

INVOICE TO

Accounts Payable
BMC Aggregates L.C.
101 BMC Drive
Eik Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
	Well # 1			10/18/23	9 AM	12 Total	v-t-200.8	zn-t-200.8	01

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By IThone Date/Time 10/18/23 12:25

Relinquished By Jeho M Mung Date/Time 10/19/23 1110
Received for Lab By Jeho M Mung Date/Time 10/19/23 1110

Remarks:

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

Accounts Payable
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by / /

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: No

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
-001	Well #2	Water	GRAB	10/18/23	8:00AM	12	624@benzene 624@nick 625@pyridine 3315@Formaldehyde ag-t-200.8 as-t-200.8 be-t-200.8 co-t-200.8 cod-t-410.4 cr-t-200.8 f-9056 hg-t-3112-low mn-t-200.8 uh3-umbrline pb-t-200.8 sb-t-200.8 so4-9056-w li-t-200.8	624@chloroform 624-base-analysis 625-126 9020-100 al-t-200.7 ba-t-200.8 b-t-200.7 ci-9056-w co-t-200.8 cu-t-200.8 fe-t-200.7 mg-t-200.7 mo-t-200.8 ni-t-200.8 phenol-t-420.1 se-t-200.8 tds-i-1750-85 iss-i-3765-85	<u>OL</u>
							Add Conductivity		

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM
Received By Thome Date/Time 10/18/23 12:25

Relinquished By Jeanette Murray Date/Time 10/19/23 11:10
Received for Lab By Jeanette Murray Date/Time 10/19/23 11:10

Remarks:



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

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BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by 1/1

LAB USE ONLY

Work Order 1GJ1657

Temperature 2-0/1.4/2.2

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
	Well #2			10/18/23	8:30AM	12 Total	v-t-200.8 zn-t-200.8	02
							Conductivity	

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By T. Thorne Date/Time 10/18/23 12:25

Relinquished By _____ Date/Time _____
Received for Lab By John Mumery Date/Time 10/19/23 1110

Remarks:

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

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101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
-001	Well #3	Water	GRAB	10/18/23	9AM	12	624@benzene 624@nhek 625@pyridine 6315@Formaldehyde ag-t-200.8 as-t-200.8 be-t-200.8 cd-t-200.8 cod-t-410.4 cr-t-200.8 f-9056 hg-t-3112-low mn-t-200.8 ni3-timberline pb-t-200.8 sb-t-200.8 so4-9056-w ti-t-200.8	624@chloroform 624-base-analysis 625-126 9020-100 al-t-200.7 ba-t-200.8 b-t-200.7 cl-9056-w co-t-200.8 cu-t-200.8 fe-t-200.7 ing-t-200.7 mo-t-200.8 ni-t-200.8 phenol-t-420.1 se-t-200.8 tds-i-1750-85 tss-i-3765-83	<u>03</u>
							Add Conductivity		

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25PM

Received By J Thome Date/Time 10/18/23 12:25

Relinquished By John Murray Date/Time 10/19/23 11:10
Received for Lab By _____ Date/Time _____

Remarks:

SITE INFORMATION

Sampler: Sherman Lundy

Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

Accounts Payable
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time
 Standard RUSH, need by / /

LAB USE ONLY

Work Order GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
	Well #3			10/18/23	9 AM	12 Total	v-t-200.6 Zn-t-200.6	03

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By T. Home Date/Time 10/18/23 12:25

Relinquished By _____ Date/Time _____

Received for Lab By Echo M... Date/Time 10/19/23 1110

Remarks:



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

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BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
-001	Well #4	Water	GRAB	10/18/23	9:30Am	12	624@benzene 624@nec 623@pyridine 6315@Formaldehyde ag-i-200.8 as-i-200.8 be-i-200.8 cd-i-200.8 cod-i-410.4 cr-i-200.8 f-9056 hg-i-3112-low ma-i-200.8 ni3-timberline pb-i-200.8 sb-i-200.8 su4-9056-w tl-i-200.8	624@chloroform 624-base-analysis 623-126 9020-100 al-i-200.7 ba-i-200.8 b-i-200.7 ci-9056-w co-i-200.8 cu-i-200.8 fe-i-200.7 ing-i-200.7 mo-i-200.8 ni-i-200.8 phenol-i-420.1 se-i-200.8 ids-i-1750-85 iss-i-3765-85	<u>CA</u>
							<i>Add Conductivity</i>		

Sherman Lundy 10/18/23 12:25PM
Relinquished By Date/Time

T. Thome 10/18/23 12:25
Received By Date/Time

Jero M... 10/19/23 11:10
Received for Lab By Date/Time

Remarks:

Original - Lab Copy Yellow - Sampler Copy



SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

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BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0/1.4/2.2

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
	We 11 # 4			10/18/23	9:30 AM	12 Total	v-t-200.8 Zn-t-200.8	04
							Conductivity	

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By [Signature] Date/Time 10/18/23 12:25

Relinquished By [Signature] Date/Time 10/19/23 1110

Received for Lab By [Signature] Date/Time 10/19/23 1110

Remarks:



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

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BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0

Turn-Cooler: No

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
-001	Upgradient Well	Water	GRAB	10/18/23	10 AM	12	624@benzene 624@nec 625@pyridine 6315@Formaldehyde ag-t-200.8 as-t-200.8 be-t-200.8 cd-t-200.8 cod-t-410.4 cr-t-200.8 f-9056 hg-t-3112-iow mn-t-200.8 ni3-timberline pb-t-200.8 sb-t-200.8 so4-9056-w tl-t-200.8	624@chloroform 624-base-analysis 625-126 9020-100 al-t-200.7 ba-t-200.8 b-t-200.7 cl-9056-w co-t-200.8 cu-t-200.8 fc-t-200.7 ug-t-200.7 mo-t-200.8 ni-t-200.8 phenol-t-420.1 se-t-200.8 ids-i-1750-85 iss-i-3765-85	<u>05</u>

Add Conductivity

Relinquished By Sherman Lundy Date/Time 10/18/23 12:25 PM

Received By Fitone Date/Time 10/18/23 12:25

Relinquished By _____ Date/Time _____

Received for Lab By _____ Date/Time _____

Remarks:

Original - Lab Copy Yellow - Sampler Copy



1 G J 1 6 5 7

BMC Aggregates L.C.
PM: Heather Tisdale

SITE INFORMATION

Sampler: Sherman Lundy
Project: GW Monitoring
Miller Creek Area

REPORT TO

Sherman Lundy
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

INVOICE TO

Accounts Payable
BMC Aggregates L.C.
101 BMC Drive
Elk Run Heights, IA 50707

SPECIAL INSTRUCTIONS

None

Turn Around Time

Standard RUSH, need by 1/1

LAB USE ONLY

Work Order 1GJ1657

Temperature 2.0

Turn-Cooler: **No**

- Custody Seal
- Containers Intact
- COC/Labels Agree
- Preservation Confirmed
- Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses		Lab Sample Number
	Up gradient Up gradient Well			10/18/23	10 AM	Total 12	v-t-200.8	z-t-200.8	05

Relinquished By Sherman Lundy

Date/Time 10/18/23 12:25 PM

Relinquished By _____

Date/Time _____

Received By Heather Tisdale

Date/Time 10/18/23 12:25

Received for Lab By _____

Date/Time _____

Original - Lab Copy Yellow - Sampler Copy

Remarks:

Appendix C
Summary of Groundwater Chemistry

Sample	Retirefarm	Well#1	Well#2	Well#3	Well#4
3/19/2019	UPG	DNG	0.165	0.247	0.408
Aluminum, mg/L (CAS NO - 7429-90-5)	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
10/16/2019	< 0.05	< 0.05	< 0.05	< 0.05	0.308
3/18/2020	< 0.05	0.062	< 0.05	< 0.05	0.233
10/16/2020	< 0.05	0.077	0.061	0.096	0.971
3/17/2021	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
10/20/2021	< 0.05	< 0.05	0.069	0.259	0.512
3/17/2022	0.057	< 0.05	0.092	0.093	0.327
10/18/2022	< 0.05	< 0.05	0.059	< 0.05	< 0.05
3/14/2023	< 0.05	0.05	< 0.05	0.549	0.074
10/18/2023	< 0.05	< 0.05	< 0.05	< 0.05	1.83
12/16/2009	< 0.0002	N/A	N/A	N/A	N/A
12/16/2009	< 0.0002	N/A	N/A	N/A	N/A
1/15/2010	< 0.0002	N/A	N/A	N/A	N/A
2/18/2010	0.0005	0.001	0.0012	0.0007	0.0018
3/16/2010	< 0.0002	0.0002	0.0011	0.0007	N/A
3/23/2010	N/A	N/A	N/A	N/A	< 0.0002
4/15/2010	0.0003	0.0011	0.0017	0.002	0.0006
5/17/2010	0.0002	0.0029	0.0011	0.0013	0.0023
6/21/2010	< 0.0002	0.0008	0.0011	0.0018	0.002
7/16/2010	0.0005	0.0038	0.0029	0.0047	0.0014
8/18/2010	0.0006	0.0009	0.0021	0.0008	0.0012
9/20/2010	< 0.0002	< 0.0002	0.0014	0.0017	0.0018
10/18/2010	< 0.0002	0.0041	0.0027	< 0.0002	0.0013
11/16/2010	< 0.0002	< 0.0002	0.0022	0.0018	< 0.0002
12/16/2010	< 0.0002	< 0.0002	0.0025	0.0013	< 0.0002
1/13/2011	< 0.0002	< 0.0002	0.0023	< 0.0002	< 0.0002
2/16/2011	0.0003	0.0005	0.0028	0.001	0.0006
5/18/2011	< 0.0002	< 0.0002	0.0018	< 0.0002	< 0.0002
8/17/2011	< 0.0002	0.0005	0.003	0.0013	0.0005
10/17/2011	< 0.0002	< 0.0002	0.0014	0.0006	0.0009
1/18/2012	0.0002	0.0003	0.0015	0.0009	0.0003
4/17/2012	< 0.0002	0.0006	0.0013	0.0012	0.0001
7/17/2012	0.0002	0.0004	0.0002	0.0013	0.0012
11/14/2012	< 0.0002	0.0004	0.0012	0.0007	0.0006
3/19/2013	< 0.0002	0.0006	0.0016	0.0008	0.0003
6/17/2013	0.001	0.0019	0.004	0.0017	0.0008
9/17/2013	< 0.0002	0.0007	0.001	0.0005	0.0002
12/17/2013	0.0002	0.0009	0.0013	0.0007	0.0003
2/17/2014	0.0005	0.001	0.0014	0.0012	0.0004
4/15/2014	0.0003	0.0004	0.0007	0.0006	0.0005
7/15/2014	< 0.0002	0.001	0.0008	0.0005	0.0004
10/13/2014	0.0006	0.0012	0.0016	0.001	0.0007
1/16/2015	< 0.0002	0.0004	0.0007	0.0006	< 0.0002
5/13/2015	0.0002	0.0003	0.0004	0.0019	0.0001
8/18/2015	0.0001	0.0003	0.0006	0.0003	0.0018
11/17/2015	< 0.0002	0.0003	0.0004	0.0013	0.0002
3/16/2016	< 0.0001	0.0002	0.0011	0.0011	0.0002
10/12/2016	< 0.0001	0.0009	0.0008	0.0003	0.0002
3/16/2017	0.0001	0.0006	0.0007	0.001	0.0003
10/12/2017	0.0003	0.0002	0.0007	0.0003	0.0003
3/14/2018	0.0002	< 0.0001	0.0009	0.0002	0.0003
10/17/2018	< 0.0001	0.0003	0.0017	0.0002	0.0005
3/19/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
10/16/2019	0.0003	< 0.0001	0.0002	0.0009	0.0002
3/18/2020	< 0.0008	< 0.0008	< 0.0008	0.0008	< 0.0008
10/16/2020	< 0.0008	< 0.0008	< 0.0008	0.0008	< 0.0008
3/17/2021	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
10/20/2021	0.0005	< 0.0002	0.0002	0.0004	0.0007
3/17/2022	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
10/18/2022	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
3/14/2023	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.001
10/18/2023	0.0009	< 0.0008	< 0.0008	< 0.0008	< 0.0008
12/16/2009	< 0.0003	N/A	N/A	N/A	N/A
12/16/2009	0.0013	N/A	N/A	N/A	N/A
1/15/2010	< 0.0003	N/A	N/A	N/A	N/A
2/18/2010	0.0022	0.0012	0.0037	0.0007	0.0006
3/16/2010	N/A	N/A	N/A	N/A	N/A
4/15/2010	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
5/17/2010	0.0009	0.0009	0.0015	0.0005	0.0003
6/21/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
7/16/2010	0.0005	0.0006	0.0006	0.0008	0.0003
8/18/2010	0.0006	0.0009	0.0021	0.0008	0.0012
9/20/2010	< 0.0002	< 0.0002	0.0014	0.0017	0.0018
10/18/2010	< 0.0002	0.0041	0.0027	< 0.0002	0.0013
11/16/2010	< 0.0002	< 0.0002	0.0022	0.0018	< 0.0002
12/16/2010	< 0.0002	< 0.0002	0.0025	0.0013	< 0.0002
1/13/2011	< 0.0002	< 0.0002	0.0023	< 0.0002	< 0.0002
2/16/2011	0.0003	0.0005	0.0028	0.001	0.0006
5/18/2011	< 0.0002	< 0.0002	0.0018	< 0.0002	< 0.0002
8/17/2011	< 0.0002	0.0005	0.003	0.0013	0.0005
10/17/2011	< 0.0002	< 0.0002	0.0014	0.0006	0.0009
1/18/2012	0.0002	0.0003	0.0015	0.0009	0.0003
4/17/2012	< 0.0002	0.0006	0.0013	0.0012	0.0001
7/17/2012	0.0002	0.0004	0.0002	0.0013	0.0012
11/14/2012	< 0.0002	0.0004	0.0012	0.0007	0.0006
3/19/2013	< 0.0002	0.0006	0.0016	0.0008	0.0003
6/17/2013	0.001	0.0019	0.004	0.0017	0.0008
9/17/2013	< 0.0002	0.0007	0.001	0.0005	0.0002
12/17/2013	0.0002	0.0009	0.0013	0.0007	0.0003
2/17/2014	0.0005	0.001	0.0014	0.0012	0.0004
4/15/2014	0.0003	0.0004	0.0007	0.0006	0.0005
7/15/2014	< 0.0002	0.001	0.0008	0.0005	0.0004
10/13/2014	0.0006	0.0012	0.0016	0.001	0.0007
1/16/2015	< 0.0002	0.0004	0.0007	0.0006	< 0.0002
5/13/2015	0.0002	0.0003	0.0004	0.0019	0.0001
8/18/2015	0.0001	0.0003	0.0006	0.0003	0.0018
11/17/2015	< 0.0002	0.0003	0.0004	0.0013	0.0002
3/16/2016	< 0.0001	0.0002	0.0011	0.0011	0.0002
10/12/2016	< 0.0001	0.0009	0.0008	0.0003	0.0002
3/16/2017	0.0001	0.0006	0.0007	0.001	0.0003
10/12/2017	0.0003	0.0002	0.0007	0.0003	0.0003
3/14/2018	0.0002	< 0.0001	0.0009	0.0002	0.0003
10/17/2018	< 0.0001	0.0003	0.0017	0.0002	0.0005
3/19/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
10/16/2019	0.0003	< 0.0001	0.0002	0.0009	0.0002
3/18/2020	< 0.0008	< 0.0008	< 0.0008	0.0008	< 0.0008
10/16/2020	< 0.0008	< 0.0008	< 0.0008	0.0008	< 0.0008
3/17/2021	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
10/20/2021	0.0005	< 0.0002	0.0002	0.0004	0.0007
3/17/2022	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
10/18/2022	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
3/14/2023	< 0.0008	< 0.0008	< 0.0008	< 0.0008	0.001
10/18/2023	0.0009	< 0.0008	< 0.0008	< 0.0008	< 0.0008
12/16/2009	< 0.0003	N/A	N/A	N/A	N/A
12/16/2009	0.0013	N/A	N/A	N/A	N/A
1/15/2010	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
2/18/2010	0.0022	0.0012	0.0037	0.0007	0.0006
3/16/2010	N/A	N/A	N/A	N/A	N/A
4/15/2010	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
5/17/2010	0.0009	0.0009	0.0015	0.0005	0.0003
6/21/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
7/16/2010	0.0005	0.0006	0.0006	0.0008	0.0003
8/18/2010	0.0006	0.0009	0.0021	0.0008	0.0012
9/20/2010	< 0.0002	< 0.0002	0.0014	0.0017	0.0018
10/18/2010	< 0.0002	0.0041	0.0027	< 0.0002	0.0013
11/16/2010	< 0.0002	< 0.0002	0.0022	0.0018	< 0.0002
12/16/2010	< 0.0002	< 0.0002	0.0025	0.0013	< 0.0002
1/13/2011	< 0.0002	< 0.0002	0.0023	< 0.0002	< 0.0002
2/16/2011	0.0003	0.0005	0.0028	0.001	0.0006
5/18/2011	< 0.0002	< 0.0002	0.0018	< 0.0002	< 0.0002
8/17/2011	< 0.0002	0.0005	0.003	0.0013	0.0005
10/17/2011	< 0.0002	< 0.0002	0.0014	0.0006	0.0009
1/18/2012	0.0002	0.0003	0.0015	0.0009	0.0003
4/17/2012	< 0.0002	0.0006	0.0013	0.0012	0.0001
7/17/2012	0.0002	0.0004	0.0002	0.0013	0.0012
11/14/2012	< 0.0002	0.0004	0.0012	0.0007	0.0006
3/19/2013	< 0.0002	0.0006	0.0016	0.0008	0.0003
6/17/2013	0.001	0.0019	0.004	0.0017	0.0008
9/17/2013	< 0.0002	0.0007	0.001	0.0005	0.0002
12/17/2013	0.0002	0.0009	0.0013	0.0007	0.0003
2/17/2014	0.0005	0.001	0.0014	0.0012	0.0004
4/15/2014	0.0003	0.0004	0.0007	0.0006	0.0005
7/15/2014	< 0.0002	0.001	0.0008		

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Arsenic, mg/L (CAS NO - 7440-38-2)	6/21/2010	0.0013	0.0007	0.0021	0.0017	0.0025
	7/16/2010	< 0.0003	0.001	0.0016	< 0.0003	0.0009
	8/18/2010	0.0019	0.0049	0.0019	0.0036	0.0017
	9/20/2010	0.0006	0.0007	0.0016	0.0006	< 0.0003
	10/18/2010	< 0.0003	0.0009	0.0015	0.0026	0.0006
	11/16/2010	< 0.0003	0.0012	0.0012	< 0.0003	< 0.0003
	12/16/2010	0.0022	0.0017	0.0024	0.0017	0.0011
	1/13/2011	< 0.0003	0.002	0.0018	< 0.0003	< 0.0003
	2/16/2011	0.0003	0.0013	0.0003	0.0003	0.0003
	5/18/2011	0.0003	0.0039	0.0018	0.0015	0.0003
	8/17/2011	< 0.0003	0.0027	< 0.0003	< 0.0003	< 0.0003
	10/17/2011	< 0.0003	0.0031	< 0.0003	< 0.0003	< 0.0003
	1/18/2012	< 0.0003	0.0099	0.0075	0.0073	< 0.0003
	4/17/2012	0.0008	0.0057	0.002	0.0057	0.0011
	7/17/2012	0.0012	0.0045	0.0009	0.0076	0.0015
	11/14/2012	< 0.0003	0.0009	< 0.0003	0.0068	< 0.0003
	3/19/2013	< 0.0003	0.0025	< 0.0003	0.0061	0.001
	6/17/2013	< 0.0003	0.0022	0.0004	0.0102	< 0.0003
	9/17/2013	0.0004	0.0034	0.001	0.0099	0.001
	12/17/2013	0.0004	0.0023	0.001	0.0124	0.0007
	2/17/2014	0.0005	0.0034	0.0006	0.0118	< 0.0003
	4/15/2014	0.0005	0.0038	0.0005	0.0112	0.0012
	7/15/2014	0.0003	0.0005	0.0015	0.01	0.0036
	10/13/2014	0.0004	0.0019	0.0006	0.009	0.0006
	1/16/2015	0.0004	0.0033	0.0006	0.0107	0.0007
	5/13/2015	0.0003	0.0026	0.0018	0.0097	0.0005
	8/18/2015	0.0003	0.0031	0.0013	0.0009	0.0088
	11/17/2015	0.0004	0.0034	0.0008	0.0089	0.0006
	3/16/2016	0.0003*	0.0027	0.0009*	0.0088	0.0009*
	10/12/2016	0.0004*	0.0027	0.0022	0.0065	0.0013*
	3/16/2017	0.0003*	0.0031	0.0008*	0.0069	0.0011*
	10/12/2017	0.0005*	0.0021	0.0007*	0.0006*	0.0013*
	3/14/2018	0.0002*	0.0028	0.0007*	0.0004*	0.0012*
	10/17/2018	< 0.0001	0.0027	0.0004*	0.0064	0.0023
	3/19/2019	0.0001	0.0029	0.0013	0.0045	0.0057
	10/16/2019	0.0004*	0.0022	0.0003*	0.0028	0.0005*
	3/18/2020	0.0007*	0.0035	0.0007*	0.0015*	0.0011*
	10/16/2020	< 0.0006	0.0026	< 0.0006	0.002	0.0009*
	3/17/2021	< 0.0006	0.0032	0.0008*	< 0.0006	0.0009*
	10/20/2021	< 0.0006	0.0017*	< 0.0006	0.002	< 0.0006
3/17/2022	< 0.0006	0.0014*	< 0.0006	< 0.0006	< 0.0006	
10/18/2022	0.0009*	0.0022	0.001*	0.0011*	0.0008*	
3/14/2023	0.0025	0.004	0.0024	0.0026	0.0029	
10/18/2023	0.0006*	0.0015*	0.0009*	0.0009*	0.002	
Barium, mg/L (CAS NO - 7440-39-3)	12/16/2009	0.241	N/A	N/A	N/A	N/A
	12/16/2009	0.241	N/A	N/A	N/A	N/A
	1/15/2010	0.111	N/A	N/A	N/A	N/A
	2/18/2010	0.111	0.0435	0.0492	0.0431	0.128
	3/16/2010	0.085	0.0416	0.0412	0.0343	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0826
	4/15/2010	0.113	0.0531	0.0491	0.0478	0.223
	5/17/2010	0.114	0.0554	0.0507	0.0476	0.116
	6/21/2010	0.115	0.0663	0.0636	0.0486	0.138
	7/16/2010	0.119	0.0749	0.0673	0.0512	0.132
	8/18/2010	0.132	0.116	0.077	0.153	0.136
	9/20/2010	0.0984	0.186	0.0971	0.51	0.112
	10/18/2010	0.118	0.262	0.197	0.208	0.133
	11/16/2010	0.107	0.336	0.11	0.0689	0.0484
	12/16/2010	0.144	0.37	0.126	0.0979	0.0808
	1/13/2011	0.104	0.394	0.121	0.0752	0.0397
	2/16/2011	0.136	0.502	0.143	0.174	0.0909
	5/18/2011	0.119	0.532	0.157	0.217	0.147
	8/17/2011	0.107	0.511	0.198	0.228	0.0638
	10/17/2011	0.0877	0.041	0.0562	0.0675	0.0433
	1/18/2012	0.0954	0.464	0.215	0.356	0.103
	4/17/2012	0.113	0.511	0.258	0.456	0.126
	7/17/2012	0.0984	0.418	0.0388	0.425	0.247
	11/14/2012	0.107	0.487	0.295	0.549	0.136
	3/19/2013	0.107	0.534	0.317	0.582	0.184
	6/17/2013	0.134	0.431	0.332	0.712	0.0895

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Summary of Groundwater Chemistry
 BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Barium, mg/L (CAS NO - 7440-39-3)	9/17/2013	0.0978	0.466	0.291	0.639	0.109
	12/17/2013	0.104	0.484	0.3	0.694	0.0934
	2/17/2014	0.0832	0.537	0.297	0.715	0.064
	4/15/2014	0.114	0.552	0.284	0.614	0.172
	7/15/2014	0.118	0.285	0.439	0.562	0.411
	10/13/2014	0.115	0.477	0.335	0.569	0.122
	1/16/2015	0.108	0.543	0.335	0.611	0.111
	5/13/2015	0.131	0.505	0.327	0.438	0.109
	8/18/2015	0.113	0.554	0.329	0.171	0.388
	11/17/2015	0.115	0.545	0.331	0.416	0.131
	3/16/2016	0.133	0.582	0.287	0.402	0.0653
	10/12/2016	0.146	0.527	0.364	0.291	0.162
	3/16/2017	0.102	0.591	0.122	0.274	0.214
	10/12/2017	0.241	0.761	0.104	0.117	0.214
	3/14/2018	0.101	0.829	0.105	0.0953	0.279
	10/17/2018	0.118	0.792	0.0979	0.221	0.206
	3/19/2019	0.106	0.84	0.116	0.0992	1.05
	10/16/2019	0.14	0.812	0.0695	0.0973	0.0862
	3/18/2020	0.126	0.779	0.0721	0.098	0.0478
	10/16/2020	0.153	0.734	0.063	0.118	0.0906
	3/17/2021	0.0942	0.934	0.0845	0.118	0.254
	10/20/2021	0.111	0.591	0.0629	0.13	0.0641
	3/17/2022	0.0991	0.602	0.0682	0.133	0.0845
	10/18/2022	0.132	0.551	0.077	0.096	0.0934
	3/14/2023	0.267	1.08	0.162	0.18	0.203
10/18/2023	0.116	0.371	0.0817	0.0957	0.109	
Beryllium, mg/L (CAS NO - 7440-41-7)	12/16/2009	< 0.00005	N/A	N/A	N/A	N/A
	12/16/2009	0.0003	N/A	N/A	N/A	N/A
	1/15/2010	< 0.00005	N/A	N/A	N/A	N/A
	2/18/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0003
	3/16/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	N/A
	3/23/2010	N/A	N/A	N/A	N/A	< 0.00005
	4/15/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	5/17/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	6/21/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0006
	7/16/2010	0.0004	0.0004	0.0004	0.0006	0.0004
	8/18/2010	0.0002	0.0002	0.0002	0.0002	0.0002
	9/20/2010	0.0002	0.0002	0.0002	0.0003	0.0002
	10/18/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	11/16/2010	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	12/16/2010	0.0004	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	1/13/2011	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	2/16/2011	0.00005	0.00005	0.00005	0.00005	0.00005
	5/18/2011	0.00005	0.0001	0.00005	0.00005	0.00009
	8/17/2011	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	10/17/2011	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	1/18/2012	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	4/17/2012	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0001
	7/17/2012	0.0002	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	11/14/2012	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	3/19/2013	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	6/17/2013	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	9/17/2013	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0001
	12/17/2013	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	2/17/2014	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	4/15/2014	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0002
	7/15/2014	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0006
	10/13/2014	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	1/16/2015	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	5/13/2015	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	8/18/2015	< 0.00005	0.00003	0.00003	0.0002	0.00004
	11/17/2015	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
	3/16/2016	< 0.00003	< 0.00003	< 0.00003	< 0.00003	< 0.00003
	10/12/2016	< 0.00003	< 0.00003	< 0.00003	< 0.00003	0.0002*
	3/16/2017	< 0.00003	< 0.00003	< 0.00003	< 0.00003	0.0002*
	10/12/2017	0.00004*	< 0.00003	< 0.00003	< 0.00003	0.0003*
3/14/2018	< 0.00003	< 0.00003	< 0.00003	< 0.00003	0.0003	
10/17/2018	< 0.00003	< 0.00003	< 0.00003	< 0.00003	0.0002*	
3/19/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	
10/16/2019	< 0.00003	< 0.00003	< 0.00003	< 0.00003	< 0.00003	

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Beryllium, mg/L (CAS NO - 7440-41-7)	3/18/2020	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	10/16/2020	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	3/17/2021	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	10/20/2021	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	3/17/2022	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	10/18/2022	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	3/14/2023	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	10/18/2023	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001*
Boron, mg/L (CAS NO - 7440-42-8)	12/16/2009	< 0.004	N/A	N/A	N/A	N/A
	12/16/2009	< 0.004	N/A	N/A	N/A	N/A
	1/15/2010	< 0.004	N/A	N/A	N/A	N/A
	2/18/2010	0.019	0.059	0.058	0.036	0.045
	3/16/2010	0.059	0.168	0.048	0.115	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.012
	4/15/2010	0.022	0.047	0.067	0.046	0.014
	5/17/2010	0.043	0.085	0.088	0.066	0.039
	6/21/2010	0.021	0.047	0.064	0.043	0.011
	7/16/2010	0.016	0.048	0.069	0.048	0.013
	8/18/2010	0.028	0.05	0.071	0.065	0.026
	9/20/2010	0.063	0.092	0.134	0.087	0.076
	10/18/2010	0.029	0.035	0.08	0.058	0.046
	11/16/2010	0.032	0.049	0.06	0.067	0.071
	12/16/2010	0.03	0.05	0.069	0.051	0.067
	1/13/2011	0.032	0.062	0.074	0.058	0.073
	2/16/2011	0.04	0.066	0.084	0.064	0.047
	5/18/2011	0.004	0.039	0.052	0.033	0.015
	8/17/2011	0.018	0.047	0.066	0.042	0.396
	10/17/2011	< 0.004	< 0.004	< 0.004	< 0.004	0.53
	1/18/2012	0.08	0.188	0.039	0.115	0.027
	4/17/2012	0.028	0.045	0.063	0.054	0.062
	7/17/2012	0.025	0.062	0.092	0.052	0.053
	11/14/2012	0.027	0.044	0.051	0.05	0.078
	3/19/2013	0.049	0.03	0.041	0.038	0.018
	6/17/2013	0.008	0.051	0.052	0.044	0.047
	9/17/2013	0.03	0.042	0.054	0.052	0.107
	12/17/2013	0.033	0.044	0.056	0.055	0.064
	2/17/2014	0.006	< 0.004	< 0.004	< 0.004	< 0.004
	4/15/2014	0.05	0.038	0.047	0.042	0.034
	7/15/2014	0.023	0.05	0.038	0.047	0.071
	10/13/2014	0.029	0.041	0.048	0.047	0.083
	1/16/2015	0.019	0.033	0.045	0.043	0.053
	5/13/2015	0.009	0.03	0.036	0.058	0.038
	8/18/2015	0.023	0.039	0.043	0.066	0.061
	11/17/2015	0.038	0.054	0.045	0.064	0.049
	3/16/2016	0.027*	0.054*	0.05*	0.063*	0.045*
	10/12/2016	0.028*	0.059*	0.042*	0.055*	0.07*
	3/16/2017	0.027*	0.046*	0.038*	0.059*	0.054*
	10/12/2017	0.052*	0.06*	0.051*	0.081*	0.082*
	3/14/2018	< 0.057	< 0.057	< 0.057	< 0.057	< 0.057
	10/17/2018	< 0.057	0.064*	< 0.057	0.067*	0.092*
	3/19/2019	< 0.057	< 0.057	< 0.057	< 0.057	0.081
	10/16/2019	< 0.057	< 0.057	< 0.057	< 0.057	< 0.057
	3/18/2020	< 0.056	0.064*	< 0.056	< 0.056	0.16
	10/16/2020	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056
	3/17/2021	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056
	10/20/2021	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056
	3/17/2022	< 0.056	< 0.056	0.058*	< 0.056	< 0.056
	10/18/2022	0.089*	0.062*	< 0.056	< 0.056	< 0.056
	3/14/2023	< 0.056	< 0.056	< 0.056	< 0.056	< 0.056
	10/18/2023	0.058*	< 0.056	< 0.056	< 0.056	< 0.056
Cadmium, mg/L (CAS NO - 7440-43-9)	12/16/2009	< 0.0002	N/A	N/A	N/A	N/A
	12/16/2009	0.0007	N/A	N/A	N/A	N/A
	1/15/2010	< 0.0002	N/A	N/A	N/A	N/A
	2/18/2010	0.0002	0.0004	< 0.0002	< 0.0002	0.0004
	3/16/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	N/A
	3/23/2010	N/A	N/A	N/A	N/A	< 0.0002
	4/15/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	5/17/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	6/21/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	7/16/2010	0.0003	0.0003	0.0004	0.0005	0.0003

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Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Cadmium, mg/L (CAS NO - 7440-43-9)	8/18/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	9/20/2010	0.0003	< 0.0002	< 0.0002	< 0.0002	0.0001
	10/18/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	11/16/2010	0.0002	0.0003	0.0003	0.0005	0.0003
	12/16/2010	0.0108	0.0002	0.0003	0.0004	0.0008
	1/13/2011	0.0028	0.0002	0.0002	0.0003	0.0005
	2/16/2011	0.0044	0.0003	0.0003	0.0005	0.0004
	5/18/2011	0.0002	0.0002	0.0003	0.0004	0.0004
	8/17/2011	< 0.0002	0.0003	< 0.0002	< 0.0002	< 0.0002
	10/17/2011	0.0004	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	1/18/2012	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	4/17/2012	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	7/17/2012	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	11/14/2012	0.0001	0.0001	0.0002	0.0008	0.0008
	3/19/2013	0.00009	< 0.0002	< 0.0002	< 0.0002	0.0001
	6/17/2013	0.0002	< 0.0002	0.0001	< 0.0002	< 0.0002
	9/17/2013	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0001
	12/17/2013	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	2/17/2014	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	4/15/2014	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0002
	7/15/2014	0.0001	< 0.0002	< 0.0002	< 0.0002	0.00008
	10/13/2014	0.0001	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	1/16/2015	0.0002	0.0001	0.0001	0.0001	0.0001
	5/13/2015	0.0001	< 0.0002	< 0.0002	0.0002	< 0.0002
	8/18/2015	0.0001	< 0.0002	< 0.0002	< 0.0002	0.0002
	11/17/2015	0.0001	0.0001	< 0.0002	0.0002	< 0.0002
	3/16/2016	0.00009*	< 0.00007	< 0.00007	0.0001*	< 0.00007
	10/12/2016	0.00008*	< 0.00007	0.00009*	0.00007*	< 0.00007
	3/16/2017	0.00007*	< 0.00007	< 0.00007	0.0001*	< 0.00007
	10/12/2017	0.0002*	< 0.00007	< 0.00007	< 0.00007	0.00007*
	3/14/2018	0.0001*	< 0.00007	< 0.00007	< 0.00007	0.00007*
	10/17/2018	0.0003*	< 0.00007	< 0.00007	< 0.00007	0.00009*
	3/19/2019	0.0002	< 0.00007	< 0.00007	0.0002	0.0002
	10/16/2019	0.0001*	< 0.00007	< 0.00007	< 0.00007	< 0.00007
	3/18/2020	0.0001*	< 0.00008	< 0.00008	< 0.00008	0.00008*
	10/16/2020	< 0.00008	< 0.00008	< 0.00008	0.00009*	< 0.00008
	3/17/2021	0.00008*	< 0.00008	< 0.00008	< 0.00008	< 0.00008
	10/20/2021	< 0.00008	< 0.00008	< 0.00008	0.00008*	< 0.00008
	3/17/2022	< 0.00008	< 0.00008	0.0001*	< 0.00008	< 0.00008
	10/18/2022	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008
3/14/2023	0.00009*	< 0.00008	< 0.00008	< 0.00008	< 0.00008	
10/18/2023	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	
Chloride, mg/L (CAS NO - 16887-00-6)	1/15/2010	53.6	N/A	N/A	N/A	N/A
	2/18/2010	20.3	44.6	43.4	25	33.2
	3/16/2010	24.6	23.7	21.2	28.1	N/A
	3/23/2010	N/A	N/A	N/A	N/A	16.5
	4/15/2010	20	19.5	16	25.1	17.2
	5/17/2010	20.4	31.9	16.5	21.4	17.4
	6/21/2010	20.4	19.3	16.4	20.6	17.8
	7/16/2010	25.5	22.7	17.3	23.8	15.7
	8/18/2010	29.9	28	27.3	27.2	24.9
	9/20/2010	27.1	25.9	26.2	29.7	26.6
	10/18/2010	21	17.4	14.9	19.6	18.2
	11/16/2010	15.2	15.4	15.1	20	17.9
	12/16/2010	13.8	15.8	15.2	20.2	23.8
	1/13/2011	14	15.2	15.6	21.1	19.6
	2/16/2011	19.3	18.9	16.8	22.5	15.4
	5/18/2011	28.7	17.5	23.2	20.7	24.8
	8/17/2011	13.4	14.4	13.5	16.7	26.4
	1/18/2012	16.2	14.9	14.8	19.1	17.4
	4/17/2012	17.6	14.7	14.1	18.7	18.7
	7/17/2012	12.7	11.4	35.2	13.7	9.3
	11/14/2012	21.1	19.1	16.6	22.6	27.6
	3/19/2013	19.4	15.1	11.3	19.7	14.7
	6/17/2013	24.3	11.7	11.1	18.1	18.4
9/17/2013	19.4	12.1	11	19.4	30	
12/17/2013	18.3	11.8	10.3	16.8	17.1	
2/17/2014	19.6	13.7	13	19.4	18.6	
4/15/2014	20.6	12.9	11	18	21.7	
7/15/2014	26	13.7	11.1	19	23	

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Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Chloride, mg/L (CAS NO - 16887-00-6)	10/13/2014	22.2	14.2	10.5	18.9	19.9
	1/16/2015	26.8	14.7	11.5	20	23.2
	5/13/2015	30.1	13.6	10.2	2240	21.6
	8/18/2015	26.6	12.8	9.5	2000	24.6
	11/17/2015	21.6	14.1	9.8	1950	21.8
	3/16/2016	29	11	7.3	1570	22.7
	10/12/2016	27.2	11	9.3	1350	21.2
	3/16/2017	28.1	10.2	10.6	1250	21.7
	10/12/2017	23.6	9.3	11.6	29.1	16.3
	3/14/2018	25.6	9	11.8	28.5	11.8
	10/17/2018	17.9	10.4	11.9	578	16.7
	3/19/2019	20.7	9.4	13.9	112	14.4
	10/16/2019	30.4	17.5	16.4	33.4	21.2
	3/18/2020	23.9	8.9	14.1	23.9	29.7
	10/16/2020	27.4	9.3	12.6	22.1	12.6
	3/17/2021	17.3	9	13.2	22.5	13.3
	10/20/2021	27.2	9.6	12.5	29.9	15.3
	3/17/2022	22.9	9.2	15.2	25.1	18.5
	10/18/2022	38.3	9.2	12.4	22	21
	3/14/2023	26.8	10.1	13.3	20.3	24.1
10/18/2023	35	9.8	12.4	23.8	20	
Chromium, mg/L (CAS NO - 7440-47-3)	12/16/2009	< 0.0009	N/A	N/A	N/A	N/A
	12/16/2009	0.0072	N/A	N/A	N/A	N/A
	1/15/2010	< 0.0009	N/A	N/A	N/A	N/A
	2/18/2010	< 0.0009	< 0.0009	0.0009	< 0.0009	< 0.0009
	3/16/2010	0.0038	0.0045	0.102	0.0044	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0031
	4/15/2010	< 0.0009	< 0.0009	0.0009	< 0.0009	< 0.0009
	5/17/2010	< 0.0009	0.0027	0.0018	0.0021	0.0023
	6/21/2010	0.002	0.0061	0.0078	0.0361	0.012
	7/16/2010	0.0021	0.006	0.0026	0.0209	0.0027
	8/18/2010	0.001	0.0038	0.0157	0.0009	0.0012
	9/20/2010	< 0.0009	< 0.0009	0.017	0.0142	0.0131
	10/18/2010	< 0.0009	0.0329	0.0168	< 0.0009	< 0.0009
	11/16/2010	0.0001	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	12/16/2010	0.0004	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	1/13/2011	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	2/16/2011	0.0003	0.0002	0.00006	0.00006	0.00006
	5/18/2011	0.0001	0.0002	0.0002	0.0002	0.0002
	8/17/2011	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	10/17/2011	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	1/18/2012	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	4/17/2012	< 0.0009	< 0.0009	< 0.0009	0.0022	< 0.0009
	7/17/2012	0.0046	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	11/14/2012	0.0102	0.0014	0.0021	0.0013	0.0019
	3/19/2013	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	6/17/2013	0.0064	0.0002	0.0009	0.0007	< 0.0009
	9/17/2013	0.0005	0.0002	0.0002	0.0003	0.0017
	12/17/2013	0.0008	< 0.0009	0.0002	0.0009	0.0009
	2/17/2014	0.0012	0.0002	0.0002	0.0007	< 0.0009
	4/15/2014	0.0001	0.0001	< 0.0009	0.0007	0.001
	7/15/2014	0.0006	0.0001	< 0.0009	0.0005	0.0011
	10/13/2014	0.0019	0.0024	0.0001	0.0003	0.0007
	1/16/2015	0.0014	0.0002	0.0004	0.0006	0.0296
	5/13/2015	0.001	< 0.0009	< 0.0009	0.028	0.0014
	8/18/2015	0.0006	< 0.0009	< 0.0009	0.0021	0.0218
	11/17/2015	0.0007	0.0004	0.0004	0.012	0.0026
	3/16/2016	0.0017*	0.0006*	0.0005*	0.0081	0.0007*
	10/12/2016	0.0029	< 0.0003	0.0004*	0.0007*	0.0007*
	3/16/2017	0.0007*	0.0004*	0.0028	0.0016*	0.0026
	10/12/2017	0.0048	< 0.0003	0.0004*	0.0006*	0.0009*
3/14/2018	0.0003*	0.0012*	0.0003*	0.0003*	0.0011*	
10/17/2018	0.0007*	< 0.0003	0.0014*	0.0007*	0.0018*	
3/19/2019	0.0009	0.0019	0.0034	0.0149	0.0094	
10/16/2019	0.0011*	0.0005*	0.0003*	0.0005*	0.0018*	
3/18/2020	< 0.0007	< 0.0007	< 0.0007	< 0.0007	0.001*	
10/16/2020	0.001*	0.0008*	< 0.0007	0.0007*	0.0027	
3/17/2021	< 0.0007	0.0008*	0.0021	0.0007*	< 0.0007	
10/20/2021	0.0012*	< 0.0007	0.0008*	0.002	0.001*	
3/17/2022	< 0.0007	< 0.0007	< 0.0007	< 0.0007	0.0015*	

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BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Chromium, mg/L (CAS NO - 7440-47-3)	10/18/2022	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	3/14/2023	0.0012*	0.0011*	0.0009*	0.0031	0.0022
	10/18/2023	< 0.0007	< 0.0007	< 0.0007	< 0.0007	0.005
Cobalt, mg/L (CAS NO - 7440-48-4)	12/16/2009	0.0072	N/A	N/A	N/A	N/A
	12/16/2009	0.0072	N/A	N/A	N/A	N/A
	1/15/2010	0.0003	N/A	N/A	N/A	N/A
	2/18/2010	0.0002	0.0003	0.0003	0.0005	0.0007
	3/16/2010	0.0002	0.0007	0.0024	0.0005	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0008
	4/15/2010	0.0002	0.0003	0.0007	0.0004	0.0003
	5/17/2010	0.0001	0.0004	0.0005	0.0004	0.0002
	6/21/2010	0.0002	0.0007	0.0006	0.0012	0.0005
	7/16/2010	0.0003	0.0009	0.0005	0.0012	0.0004
	8/18/2010	0.0003	0.0005	0.0007	0.0025	0.0004
	9/20/2010	0.0002	0.0003	0.0007	0.0008	0.0007
	10/18/2010	0.0004	0.0005	0.0007	0.0003	0.0002
	11/16/2010	< 0.0009	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	12/16/2010	0.004	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	1/13/2011	0.0019	< 0.0009	< 0.0009	< 0.0009	< 0.0009
	2/16/2011	0.0164	0.0009	0.0009	0.0009	0.0009
	5/18/2011	0.0009	0.0009	0.0009	0.0009	0.0009
	8/17/2011	0.0003	0.0004	0.0006	0.0008	0.0004
	10/17/2011	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
	1/18/2012	0.0002	0.0002	0.0003	0.0008	0.0003
	4/17/2012	0.0003	0.0003	0.0003	0.0009	0.0004
	7/17/2012	0.0033	0.0002	0.0006	0.0007	0.0003
	11/14/2012	0.0006	0.0002	0.0003	0.0008	0.0006
	3/19/2013	0.0004	0.0002	0.0002	0.0004	0.0006
	6/17/2013	0.0015	< 0.0001	0.0001	0.0004	0.0002
	9/17/2013	< 0.0001	< 0.0001	< 0.0001	0.0003	0.0004
	12/17/2013	0.0001	< 0.0001	< 0.0001	0.0003	0.0004
	2/17/2014	0.0008	0.00007	0.00008	0.0003	0.0002
	4/15/2014	< 0.0001	< 0.0001	< 0.0001	0.0003	0.0003
	7/15/2014	< 0.0001	< 0.0001	< 0.0001	0.0002	0.0003
	10/13/2014	0.0005	< 0.0001	< 0.0001	0.0002	0.0003
	1/16/2015	< 0.0001	< 0.0001	< 0.0001	0.0002	0.002
	5/13/2015	0.0001	0.00004	0.00007	0.0001	0.0002
	8/18/2015	0.00007	0.00004	0.00006	0.0002	0.0004
	11/17/2015	0.00009	0.00006	< 0.0001	0.00045	0.0001
	3/16/2016	0.00008*	< 0.00004	0.00007*	0.0035	0.00007*
	10/12/2016	0.0001*	< 0.00004	0.0001*	0.0071	0.0002*
	3/16/2017	0.00008*	< 0.00004	0.00005*	0.0073	0.0002*
	10/12/2017	0.0002*	< 0.00004	0.00007*	0.0001*	0.0006*
	3/14/2018	0.0001*	0.00009*	0.00005*	0.0002*	0.0002*
	10/17/2018	0.0002*	0.0002*	0.0002*	0.0003*	0.0003*
	3/19/2019	0.0001	0.00005	0.0002	0.0092	0.0018
	10/16/2019	0.00005*	0.00005*	0.00004*	0.0006*	0.0002*
	3/18/2020	< 0.0005	< 0.0005	< 0.0005	0.0009*	< 0.0005
	10/16/2020	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005*
	3/17/2021	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	10/20/2021	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	3/17/2022	0.0006*	< 0.0005	< 0.0005	< 0.0005	0.0005*
	10/18/2022	0.0013*	0.0017*	0.0014*	0.0013*	0.0016*
	3/14/2023	< 0.0005	< 0.0005	< 0.0005	0.0007*	0.0005*
	10/18/2023	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0015*
Copper, mg/L (CAS NO - 7440-50-8)	12/16/2009	0.0214	N/A	N/A	N/A	N/A
	12/16/2009	0.0214	N/A	N/A	N/A	N/A
	1/15/2010	0.0054	N/A	N/A	N/A	N/A
	2/18/2010	0.003	0.0672	0.0941	0.0041	0.0081
	3/16/2010	0.0029	0.0147	0.0111	0.0069	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0041
	4/15/2010	0.0018	0.0117	0.0031	0.0092	0.0083
	5/17/2010	0.0019	0.0164	0.0006	0.0077	0.0033
	6/21/2010	0.0062	0.0099	0.0032	2.56	0.764
	7/16/2010	0.0074	0.0106	0.0019	0.631	0.0248
	8/18/2010	0.0034	0.0036	0.0025	0.0033	0.016
	9/20/2010	0.0025	0.0014	0.0017	0.033	0.0047
	10/18/2010	0.0048	0.001	0.0029	0.0043	0.0054
	11/16/2010	0.0088	0.0018	0.0014	0.0162	0.0017
	12/16/2010	0.0584	0.0012	0.0018	0.0113	0.0015

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG	
Copper, mg/L (CAS NO - 7440-50-8)	1/13/2011	0.0274	0.0005	0.0016	0.0032	0.0012	
	2/16/2011	0.0194	0.0013	0.0013	0.0075	0.0011	
	5/18/2011	0.0027	0.0004	0.0015	0.0017	0.0012	
	8/17/2011	0.004	0.0011	0.0021	0.0077	< 0.0004	
	10/17/2011	0.0133	< 0.0004	< 0.0004	< 0.0004	0.0025	
	1/18/2012	0.0041	< 0.0004	0.0008	0.0133	0.0191	
	4/17/2012	0.002	0.0008	< 0.0004	0.016	< 0.0004	
	7/17/2012	0.0228	< 0.0004	0.0011	0.0079	0.0019	
	11/14/2012	0.0072	0.0029	0.0018	0.0065	0.0031	
	3/19/2013	0.118	0.0033	0.0026	0.0074	0.0033	
	6/17/2013	0.0183	0.0031	0.0128	0.0101	0.0473	
	9/17/2013	0.0043	0.0029	0.0023	0.0041	0.0058	
	12/17/2013	0.0062	0.0015	0.0022	0.0068	0.0022	
	2/17/2014	0.003	0.002	0.0023	0.0037	0.004	
	4/15/2014	0.0238	0.0013	0.0011	0.0024	0.0043	
	7/15/2014	0.0191	0.0011	0.0017	0.0032	0.0026	
	10/13/2014	0.0261	0.0022	0.0022	0.0035	0.0033	
	1/16/2015	0.0158	0.0025	0.0028	0.0042	0.0053	
	5/13/2015	0.342	0.0017	0.001	0.0103	0.0017	
	8/18/2015	0.0125	0.0013	0.0009	0.0021	0.0095	
	11/17/2015	0.0945	0.0014	0.0011	0.0083	0.0035	
	3/16/2016	0.0391	0.0015*	0.0016*	0.0116	0.0022	
	10/12/2016	0.0241	0.0013*	0.0048	0.0095	0.0056	
	3/16/2017	0.0266	0.0036	0.0021	0.0059	0.0039	
	10/12/2017	0.0927	0.0046	0.0043	0.0169	0.0045	
	3/14/2018	0.688	0.0026	0.002	0.006	0.0064	
	10/17/2018	0.0256	0.0056	0.005	< 0.004	< 0.004	
	3/19/2019	0.0119	0.0043	0.0086	0.0149	0.0103	
	10/16/2019	0.0538	0.0034	0.0015*	0.0017*	0.0024	
	3/18/2020	0.0615	0.0028	0.002	0.0039	0.0055	
	10/16/2020	0.014	0.0032	0.0015*	0.0032	0.0087	
	3/17/2021	0.0907	0.0027	0.0057	0.0041	0.003	
	10/20/2021	0.0718	0.002	0.0026	0.0055	0.002	
	3/17/2022	0.0293	0.002	0.0101	0.0023	0.0045	
	10/18/2022	0.0235	0.0032	0.0032	0.0031	0.0034	
	3/14/2023	0.082	0.0084	0.0041	0.0089	0.0068	
	10/18/2023	0.0067	0.0032	0.003	0.0051	0.0073	
	Fluoride, mg/L (CAS NO - 16984-48-8)	3/19/2019	0.3	1	0.8	< 0.2	0.2
		10/16/2019	0.2	1.7	1	0.6	0.3
		3/18/2020	0.4	0.9	0.7	0.6	0.3
10/16/2020		0.2	0.8	0.6	0.5	0.2	
3/17/2021		0.8	0.9	0.7	0.6	0.7	
10/20/2021		0.2	0.7	0.6	0.5	0.2	
3/17/2022		0.2	0.9	0.7	0.5	0.3	
10/18/2022		0.3	1	0.8	0.7	0.5	
3/14/2023		0.5	0.9	0.7	0.2	0.5	
10/18/2023		0.3	0.9	0.7	0.6	0.3	
Iron, mg/L (CAS NO - 7439-89-6)	1/15/2010	0.109	N/A	N/A	N/A	N/A	
	2/18/2010	0.121	0.164	0.208	0.1	1.57	
	3/16/2010	0.073	0.103	0.787	0.147	N/A	
	3/23/2010	N/A	N/A	N/A	N/A	0.086	
	4/15/2010	0.098	0.583	0.142	0.062	0.207	
	5/17/2010	0.067	0.362	0.595	0.103	0.173	
	6/21/2010	< 0.038	1.29	0.819	0.668	< 0.038	
	7/16/2010	< 0.038	1.65	0.373	1.02	0.252	
	8/18/2010	< 0.038	0.702	0.522	25.6	0.132	
	9/20/2010	< 0.038	0.741	1.49	1.29	0.552	
	10/18/2010	0.343	0.496	3.34	18.5	0.13	
	11/16/2010	0.187	0.638	0.492	2.05	0.256	
	12/16/2010	6.02	0.28	0.445	3.38	1.35	
	1/13/2011	1.33	0.146	0.271	1.21	0.118	
	2/16/2011	2.9	0.226	0.333	8.42	0.066	
	5/18/2011	0.038	0.415	0.193	14.2	0.385	
	8/17/2011	< 0.038	0.722	0.747	9.76	< 0.038	
	10/17/2011	< 0.038	0.611	0.562	12.1	< 0.038	
	1/18/2012	0.22	0.673	0.184	14.1	0.181	
	4/17/2012	< 0.038	1.64	0.215	22.8	0.122	
	7/17/2012	1.9	1.15	0.067	23.4	0.027	
	11/14/2012	1.11	2.21	0.684	28.7	1.19	
	3/19/2013	0.179	2.38	1.05	27.3	1.16	

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG	
Iron, mg/L (CAS NO - 7439-89-6)	6/17/2013	1.52	1.24	0.777	25.6	0.128	
	9/17/2013	< 0.038	2.03	0.521	23.7	0.707	
	12/17/2013	0.136	0.543	0.447	18.4	0.268	
	2/17/2014	0.267	1.71	0.249	22.4	0.257	
	4/15/2014	< 0.038	2.19	0.091	18.2	0.431	
	7/15/2014	0.053	0.099	0.24	19.3	1.96	
	10/13/2014	0.107	0.49	0.158	8.57	0.343	
	1/16/2015	0.031	1.8	0.31	11.8	0.823	
	5/13/2015	0.037	1.23	3.32	1.25	0.093	
	8/18/2015	0.041	1.58	2.54	0.842	1.04	
	11/17/2015	0.133	1.45	0.379	0.373	0.098	
	3/16/2016	0.028*	0.941	1.43	0.372	0.026*	
	10/12/2016	0.079*	1.18	1.57	0.517	0.793	
	3/16/2017	0.049*	1.54	2.56	1.29	1.14	
	10/12/2017	0.035*	0.805	2.68	0.313	0.439	
	3/14/2018	< 0.057	1.53	2.28	0.387	1.77	
	10/17/2018	< 0.057	1.09	1.18	4.02	0.799	
	3/19/2019	0.13	1.7	3.65	0.973	6.96	
	10/16/2019	< 0.057	0.807	0.658	0.226	0.254	
	3/18/2020	< 0.047	1.41	1.71	0.671	0.112	
	10/16/2020	< 0.047	1.09	1.49	3	0.851	
	3/17/2021	< 0.047	0.813	0.697	0.073*	0.056*	
	10/20/2021	< 0.047	0.533	0.815	0.803	0.349	
	3/17/2022	< 0.047	0.624	0.177	0.083*	0.385	
	10/18/2022	< 0.047	0.249	0.188	< 0.047	< 0.047	
	3/14/2023	< 0.047	0.463	0.439	0.441	0.243	
	10/18/2023	< 0.047	0.265	0.573	0.055*	2.43	
	Lead, mg/L (CAS NO - 7439-92-1)	12/16/2009	0.0143	N/A	N/A	N/A	N/A
		12/16/2009	0.0143	N/A	N/A	N/A	N/A
		1/15/2010	0.0008	N/A	N/A	N/A	N/A
2/18/2010		0.0005	< 0.0002	0.0004	< 0.0002	0.0032	
3/16/2010		0.0005	0.0003	0.0007	0.0008	N/A	
3/23/2010		N/A	N/A	N/A	N/A	0.0002	
4/15/2010		0.0003	0.0015	0.0004	0.0005	0.0003	
5/17/2010		0.0008	0.0015	0.0013	0.001	< 0.0002	
6/21/2010		0.0002	0.0008	0.0003	0.0008	< 0.0002	
7/16/2010		0.0008	0.0013	0.0006	0.0014	0.0006	
8/18/2010		< 0.0002	< 0.0002	0.0002	0.0004	0.0002	
9/20/2010		< 0.0002	< 0.0002	0.0004	0.0003	< 0.0002	
10/18/2010		0.0004	< 0.0002	0.0005	< 0.0002	< 0.0002	
11/16/2010		0.0006	0.0003	< 0.0002	< 0.0002	< 0.0002	
12/16/2010		0.0243	0.0003	0.0003	0.0004	0.0033	
1/13/2011		0.0179	< 0.0002	< 0.0002	< 0.0002	< 0.0002	
2/16/2011		0.0131	0.0003	0.0003	0.0003	0.0002	
5/18/2011		0.0003	0.0002	0.0003	0.0002	0.0042	
8/17/2011		0.0002	< 0.0002	0.0003	0.0002	< 0.0002	
10/17/2011		0.0011	< 0.0002	< 0.0002	< 0.0002	< 0.0002	
1/18/2012		0.0002	< 0.0002	< 0.0002	0.0004	0.0011	
4/17/2012		0.0005	0.0005	0.0002	0.0007	0.0004	
7/17/2012		0.0029	< 0.0002	< 0.0002	< 0.0002	< 0.0002	
11/14/2012		0.0075	0.0007	0.0005	0.0006	0.0083	
3/19/2013		0.002	0.0025	0.0011	0.0011	0.008	
6/17/2013		0.0161	0.0001	0.0038	0.0068	0.0087	
9/17/2013		0.0008	0.0007	0.0007	0.0005	0.0042	
12/17/2013		0.0006	0.0003	0.0003	0.0004	0.0015	
2/17/2014		0.0013	0.0003	0.0003	0.0003	0.0011	
4/15/2014		< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.002	
7/15/2014	0.0013	< 0.0002	< 0.0002	< 0.0002	0.0103		
10/13/2014	0.0015	0.0004	0.0008	0.0003	0.0021		
1/16/2015	0.00012	0.0003	< 0.0002	0.0004	0.0019		
5/13/2015	0.0173	< 0.0002	< 0.0002	0.00007	0.0005		
8/18/2015	0.0014	0.0002	0.0002	0.0028	0.0003		
11/17/2015	0.002	0.0002	0.00007	0.0002	0.0012		
3/16/2016	0.0013	0.0002*	0.0001*	0.0003*	0.0004*		
10/12/2016	0.0019	0.0001*	0.0003*	0.0002*	0.0061		
3/16/2017	0.0011	0.0003*	0.0003*	0.0005*	0.0041		
10/12/2017	0.0029	0.0001*	0.0005*	0.0006*	0.0058		
3/14/2018	0.0151	0.0002*	0.0002*	0.0002*	0.0078		
10/17/2018	0.0025	< 0.0008	< 0.0008	< 0.0008	0.0028		
3/19/2019	0.0014	0.0072	0.0206	0.0111	0.0274		

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Lead, mg/L (CAS NO - 7439-92-1)	10/16/2019	0.0038	0.0003*	0.0001*	0.0001*	0.0005*
	3/18/2020	0.002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	10/16/2020	0.0019	< 0.0005	< 0.0005	< 0.0005	0.0007*
	3/17/2021	0.0074	0.0005*	0.0008	< 0.0005	< 0.0005
	10/20/2021	0.0072	0.0009	0.0007*	0.0021	0.0005*
	3/17/2022	0.0015	< 0.0005	0.0007*	< 0.0005	0.0006*
	10/18/2022	0.002	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	3/14/2023	0.004	0.0008	< 0.0005	0.0011	0.0009
	10/18/2023	0.0007*	< 0.0005	< 0.0005	< 0.0005	0.0023
Magnesium, mg/L (CAS NO - 7439-95-4)	1/15/2010	21.9	N/A	N/A	N/A	N/A
	2/18/2010	21.3	60.2	58.5	32.6	39
	3/16/2010	20.5	54.7	38.6	36.5	N/A
	3/23/2010	N/A	N/A	N/A	N/A	20.7
	4/15/2010	22.4	53.6	41.3	35.4	22.1
	5/17/2010	21.5	56.6	40.1	33.3	20.3
	6/21/2010	22.2	52.9	42.1	35.7	3.87
	7/16/2010	24.8	56.7	42.5	37.2	21.5
	8/18/2010	22.4	53.4	38.1	51.4	20.2
	9/20/2010	22.8	49.9	40.4	34.6	25.3
	10/18/2010	23.1	30.2	38.5	39.4	26.7
	11/16/2010	23.9	49.8	41.7	38.2	43.2
	12/16/2010	33	47.2	41.7	39.1	48
	1/13/2011	22.3	46.9	41.3	38.3	46.9
	2/16/2011	25.4	48.1	42.1	39	28.1
	5/18/2011	19.1	46.8	39.8	41.2	24.6
	8/17/2011	19.5	42	40.9	35.4	10.9
	10/17/2011	20.8	41.5	41	40.6	8.31
	1/18/2012	21.2	40.3	43.2	43.3	25
	4/17/2012	23	40.9	44	51.7	26.3
	7/17/2012	22.5	38.3	52.2	50.1	41.6
	11/14/2012	21.1	38.2	41	52.4	49.7
	3/19/2013	26.4	37.7	45.1	54.8	23.8
	6/17/2013	20.1	26.8	39.2	51.8	27.3
	9/17/2013	21.1	32.2	42.3	51.1	53.2
	12/17/2013	19.8	30.1	40.1	48.1	34.7
	2/17/2014	40.3	36.3	45.8	53.6	24.7
	4/15/2014	26.8	36	41.9	45.4	32.9
	7/15/2014	20.2	44	33.5	47.5	23.8
	10/13/2014	21	33.5	42.3	45	35.9
	1/16/2015	22.5	34.6	45.6	48.3	33.2
	5/13/2015	23.1	36.3	44.3	55.4	37
	8/18/2015	19.7	35.9	44.3	34.7	49.4
	11/17/2015	22.1	36.1	41.2	53.7	34.7
	3/16/2016	22.1	33.5	36.1	51.8	29.6
	10/12/2016	21.3	31.8	38.8	45.7	23
	3/16/2017	23.3	34.3	39.1	48.9	34.6
	10/12/2017	21.9	32.2	38.3	26.5	30.5
	3/14/2018	24	37.1	43	25.1	37.6
	10/17/2018	19.9	31.3	35.5	36.8	22.3
	3/19/2019	22.5	32	38.1	30.3	24.9
	10/16/2019	23.1	33.5	37.6	27.8	26.5
	3/18/2020	23.3	33	34.7	27.1	32
	10/16/2020	23.6	31.2	36.5	28.7	24.6
	3/17/2021	25.8	32.8	35	28.5	29.5
	10/20/2021	19.3	30.7	34.3	28.2	22
	3/17/2022	20.5	31.2	35.5	28.3	26.4
	10/18/2022	22.3	32.7	37.6	27.8	28.1
	3/14/2023	23.6	31.5	37	25.3	29.2
	10/18/2023	20.8	30.9	40.1	30.8	26.1
Manganese, mg/L (CAS NO - 7439-96-5)	12/16/2009	1.59	N/A	N/A	N/A	N/A
	12/16/2009	1.59	N/A	N/A	N/A	N/A
	1/15/2010	0.0146	N/A	N/A	N/A	N/A
	2/18/2010	0.0043	0.0065	0.0111	0.0254	0.0273
	3/16/2010	0.0059	0.0212	0.039	0.0198	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0093
	4/15/2010	0.0046	0.0174	0.0307	0.0186	0.0088
	5/17/2010	0.0043	0.0164	0.0733	0.0229	0.0092
	6/21/2010	0.0032	0.0578	0.0787	0.0548	0.003
	7/16/2010	0.0035	0.0795	0.0839	0.0588	0.0135
	8/18/2010	< 0.0019	0.0633	0.0871	0.414	0.0076

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Manganese, mg/L (CAS NO - 7439-96-5)	9/20/2010	0.0022	0.0513	0.0849	0.0965	0.0157
	10/18/2010	0.004	0.0531	0.0961	0.19	0.0079
	11/16/2010	0.0035	0.0456	0.0769	0.113	0.0033
	12/16/2010	0.159	0.0434	0.0844	0.139	0.0257
	1/13/2011	0.0823	0.0425	0.0833	0.126	0.0092
	2/16/2011	0.0684	0.0425	0.071	0.142	0.0046
	5/18/2011	0.0008	0.0402	0.0865	0.166	0.0051
	8/17/2011	0.0022	0.0407	0.0913	0.167	0.002
	10/17/2011	0.0021	0.0331	0.0726	0.139	< 0.0019
	1/18/2012	< 0.0019	0.0338	0.0547	0.173	0.0048
	4/17/2012	0.0051	0.0313	0.0734	0.148	0.0072
	7/17/2012	0.0548	0.0236	0.004	0.121	0.0416
	11/14/2012	0.017	< 0.0019	0.033	0.0972	0.0157
	3/19/2013	0.0079	0.0232	0.0612	0.103	0.0203
	6/17/2013	0.049	0.0234	0.072	0.125	0.0057
	9/17/2013	0.0021	0.0226	0.0542	0.103	0.0261
	12/17/2013	0.0028	0.0065	0.0192	0.102	0.0268
	2/17/2014	0.0258	0.0159	0.0122	0.102	0.0755
	4/15/2014	0.0142	0.0187	0.0123	0.0828	0.0263
	7/15/2014	0.0078	0.0537	0.0266	0.0738	0.0205
	10/13/2014	0.0043	0.0257	0.0469	0.0732	0.0105
	1/16/2015	0.0028	0.0195	0.0214	0.0837	0.0224
	5/13/2015	0.0019	0.0169	0.0759	0.009	0.0036
	8/18/2015	0.0028	0.0221	0.0623	0.0063	0.009
	11/17/2015	0.0026	0.0198	0.0359	0.0053	0.0054
	3/16/2016	0.002*	0.0192*	0.0547	0.0173	0.0039*
	10/12/2016	0.003*	0.0153	0.0867	0.196	0.0076
	3/16/2017	0.0022*	0.0167	0.0452	0.21	0.0096
	10/12/2017	0.008	0.0142	0.0421	0.0066	0.0133
	3/14/2018	< 0.004	0.0131	0.0411	0.0053	0.0268
	10/17/2018	0.0037*	0.0131	0.0397	0.0973	0.0082
	3/19/2019	0.0075	0.0198	0.0504	0.204	0.0719
	10/16/2019	0.0026*	0.0129	0.0248	0.0241	0.0091
3/18/2020	0.0028*	0.0172	0.0284	0.0311	0.0039*	
10/16/2020	0.0018*	0.0164	0.0235	0.0307	0.0209	
3/17/2021	0.0211	0.0216	0.04	0.0034*	0.02	
10/20/2021	0.0026*	0.0114	0.0232	0.0352	0.0071	
3/17/2022	0.0025*	0.0137	0.0148	0.0214	0.0131	
10/18/2022	< 0.0017	0.0019*	0.022	0.0027*	0.004	
3/14/2023	0.0034*	0.0142	0.0648	0.0299	0.0468	
10/18/2023	< 0.0017	0.0055	0.0107	0.0072	0.0678	
Mercury, mg/L (CAS NO - 7439-97-6)	12/16/2009	< 0.00002	N/A	N/A	N/A	N/A
	12/16/2009	0.00003	N/A	N/A	N/A	N/A
	1/15/2010	0.00004	N/A	N/A	N/A	N/A
	2/18/2010	0.00008	0.00003	0.00005	0.00011	0.00016
	3/16/2010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.00005
	4/15/2010	0.00003	0.00002	< 0.00002	0.00004	< 0.00002
	5/17/2010	< 0.00002	0.00006	< 0.00002	< 0.00002	< 0.00002
	6/21/2010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
	7/16/2010	0.00008	0.00006	0.00007	0.00007	0.00013
	8/18/2010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
	9/20/2010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
	10/18/2010	0.00007	0.00002	0.00006	< 0.00002	< 0.00002
	11/16/2010	0.00003	0.00006	0.00003	0.00007	0.00008
	12/16/2010	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
	1/13/2011	0.00003	< 0.00002	0.00003	0.00005	0.00005
	2/16/2011	0.00007	0.00009	0.00008	0.00002	0.00007
	5/18/2011	0.00014	0.00002	0.00002	0.00002	0.00002
	8/17/2011	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
	10/17/2011	< 0.00002	< 0.00002	< 0.00002	0.00033	< 0.00002
	1/18/2012	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00013
	4/17/2012	< 0.00002	0.004	< 0.00002	< 0.00002	< 0.00002
	7/17/2012	< 0.00002	0.00015	< 0.00002	< 0.00002	< 0.00002
	11/14/2012	0.00025	0.00032	0.00037	0.00027	0.00018
	3/19/2013	0.00013	< 0.00002	< 0.00002	0.00017	0.00023
	6/17/2013	0.00018	0.00019	0.00021	0.00022	0.00018
	9/17/2013	< 0.00002	0.00024	0.00014	< 0.00002	0.00008
12/17/2013	0.00012	0.0001	0.00014	0.00015	0.00009	
2/17/2014	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	

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Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG	
Mercury, mg/L (CAS NO - 7439-97-6)	4/15/2014	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
	7/15/2014	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
	10/13/2014	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00014	
	1/16/2015	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
	5/13/2015	< 0.00002	< 0.00002	< 0.00002	0.00014	< 0.00002	
	8/18/2015	0.00009	0.00011	0.00011	0.00011	0.0002	
	11/17/2015	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
	3/16/2016	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	
	10/12/2016	< 0.00009	< 0.00009	< 0.00009	< 0.00009	< 0.00009	
	3/16/2017	< 0.00009	< 0.00009	< 0.00009	0.00015*	< 0.00009	
	10/12/2017	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	3/14/2018	< 0.00012	< 0.00012	< 0.00012	< 0.00012	< 0.00012	
	10/17/2018	< 0.00012	< 0.00012	< 0.00012	< 0.00012	< 0.00012	
	3/19/2019	< 0.00012	< 0.00012	< 0.00012	< 0.00012	< 0.00012	
	10/16/2019	< 0.00012	< 0.00012	< 0.00012	< 0.00012	< 0.00012	
	3/18/2020	< 0.00012	< 0.00012	< 0.00012	< 0.00012	< 0.00012	
	10/16/2020	0.00014*	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	3/17/2021	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	10/20/2021	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	3/17/2022	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	10/18/2022	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	3/14/2023	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	10/18/2023	< 0.00013	< 0.00013	< 0.00013	< 0.00013	< 0.00013	
	Molybdenum, mg/L (CAS NO - 7439-98-7)	12/16/2009	< 0.0001	N/A	N/A	N/A	N/A
		12/16/2009	0.002	N/A	N/A	N/A	N/A
1/15/2010		0.0008	N/A	N/A	N/A	N/A	
2/18/2010		0.0006	0.017	0.0173	0.007	0.0081	
3/16/2010		0.0002	0.0063	0.0143	0.0076	N/A	
3/23/2010		N/A	N/A	N/A	N/A	0.0024	
4/15/2010		0.0004	0.0075	0.0133	0.0104	0.0021	
5/17/2010		0.0003	0.0145	0.0119	0.0104	0.0016	
6/21/2010		0.0007	0.0073	0.0067	0.0937	0.023	
7/16/2010		0.0007	0.0067	0.0057	0.0319	0.0022	
8/18/2010		0.0004	0.0022	0.0036	0.0006	0.0029	
9/20/2010		0.0008	0.0021	0.0024	0.0039	0.0053	
10/18/2010		0.0005	0.0009	0.0036	0.0005	0.0048	
11/16/2010		0.0006	0.0005	0.0015	0.0031	0.0073	
12/16/2010		0.0004	0.0002	0.0016	0.0019	0.0082	
1/13/2011		0.0005	0.0001	0.0013	0.001	0.0076	
2/16/2011		0.0009	0.0004	0.0014	0.001	0.0023	
5/18/2011		0.0003	0.0001	0.0006	0.0002	0.0024	
8/17/2011		0.0007	0.0003	0.0015	0.001	0.0399	
10/17/2011		< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0644	
1/18/2012		0.0009	0.0018	0.0012	0.0014	0.0057	
4/17/2012		0.0009	0.0002	0.0002	0.0009	0.0077	
7/17/2012		0.0007	< 0.0001	0.0121	0.001	0.0005	
11/14/2012		0.0012	0.0005	< 0.0001	0.0006	0.0119	
3/19/2013		0.0047	0.0005	< 0.0001	0.0006	0.0035	
6/17/2013		0.0007	0.0003	0.0006	0.0009	0.0046	
9/17/2013		0.0006	< 0.0001	0.0004	0.0005	0.0156	
12/17/2013		0.001	< 0.0001	0.0004	0.0006	0.0053	
2/17/2014		0.0078	0.0004	0.0006	0.0006	0.0035	
4/15/2014		0.0057	0.0003	0.0006	0.0005	0.0075	
7/15/2014		0.0003	0.0004	< 0.0001	0.0003	0.0117	
10/13/2014		0.0009	0.0008	0.0007	0.0004	0.0094	
1/16/2015		0.0009	< 0.0001	0.0007	0.0003	0.006	
5/13/2015		0.0008	0.0001	0.0004	0.0208	0.0013	
8/18/2015		0.0006	0.0003	0.0004	0.0034	0.0152	
11/17/2015	0.0016	0.008	0.0009	0.0125	0.002		
3/16/2016	0.0004*	0.0001*	0.0012*	0.0114	0.0155		
10/12/2016	0.0006*	< 0.00006	0.021	0.0074	0.0285		
3/16/2017	0.0005*	< 0.00006	0.0003*	0.0076	0.0086		
10/12/2017	0.0055	< 0.00006	0.0002*	0.0039	0.0036		
3/14/2018	< 0.0019	< 0.0019	< 0.0019	0.0031	< 0.0019		
10/17/2018	0.0006*	0.0001*	0.0003*	0.0009*	0.0586		
3/19/2019	< 0.002	< 0.002	< 0.002	0.0081	0.0083		
10/16/2019	0.003	0.0001*	0.0005*	0.0089	0.0154		
3/18/2020	0.0011*	< 0.0006	< 0.0006	0.009	0.0755		
10/16/2020	0.0014*	< 0.0006	< 0.0006	0.0051	0.0023		
3/17/2021	0.0015*	0.0009*	0.0008*	0.0051	0.0008*		

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Molybdenum, mg/L (CAS NO - 7439-98-7)						
	10/20/2021	0.0035	< 0.0006	< 0.0006	0.0023	0.0024
	3/17/2022	0.0011*	< 0.0006	< 0.0006	0.0063	0.0021
	10/18/2022	0.0066	< 0.0006	< 0.0006	0.0047	0.0043
	3/14/2023	0.0044	< 0.0006	< 0.0006	0.006	0.0091
	10/18/2023	0.0063	0.001*	< 0.0006	0.0028	0.004
Nickel, mg/L (CAS NO - 7440-02-0)						
	12/16/2009	0.0417	N/A	N/A	N/A	N/A
	12/16/2009	0.0417	N/A	N/A	N/A	N/A
	1/15/2010	0.0052	N/A	N/A	N/A	N/A
	2/18/2010	0.0039	0.0045	0.0049	0.0072	0.0077
	3/16/2010	0.0034	0.0062	0.0632	0.0066	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0085
	4/15/2010	0.0028	0.0041	0.005	0.0089	0.0041
	5/17/2010	0.0033	0.0067	0.0048	0.0079	0.0051
	6/21/2010	0.0042	0.0069	0.0074	0.0254	0.0091
	7/16/2010	0.0048	0.0078	0.0072	0.0246	0.0058
	8/18/2010	0.0253	0.0055	0.0112	0.0088	0.0054
	9/20/2010	0.004	0.0045	0.0128	0.0135	0.0124
	10/18/2010	0.0032	0.0156	0.0119	0.0034	0.005
	11/16/2010	0.0033	0.003	0.0032	0.0073	0.0068
	12/16/2010	0.0238	0.0039	0.0045	0.0075	0.0121
	1/13/2011	0.0092	0.0027	0.0033	0.0055	0.0119
	2/16/2011	0.0188	0.0031	0.0034	0.0061	0.0047
	5/18/2011	0.005	0.0041	0.0044	0.007	0.0061
	8/17/2011	0.0048	0.005	0.0059	0.0079	0.0052
	10/17/2011	0.0037	0.0035	0.0037	0.0078	0.0046
	1/18/2012	0.0025	0.0025	0.0027	0.007	0.0035
	4/17/2012	0.0057	0.005	0.0054	0.0131	0.0087
	7/17/2012	0.0232	0.0027	0.0149	0.0095	0.0086
	11/14/2012	0.0089	0.0049	0.0052	0.0099	0.0147
	3/19/2013	0.0041	0.0036	0.0043	0.0064	0.0046
	6/17/2013	0.007	0.0008	0.0023	0.0027	0.0015
	9/17/2013	0.0006	0.0008	0.0009	0.0022	0.012
	12/17/2013	0.0008	0.0006	0.0009	0.0029	0.0069
	2/17/2014	0.0104	0.0006	0.001	0.003	0.0008
	4/15/2014	0.0016	0.0005	0.0006	0.003	0.0064
	7/15/2014	0.0009	0.0009	0.0011	0.0028	0.004
	10/13/2014	0.0026	0.0024	0.0011	0.0047	0.0051
	1/16/2015	0.0015	0.0009	0.001	0.0029	0.0787
	5/13/2015	0.0051	< 0.0001	< 0.0001	0.0431	0.0018
	8/18/2015	0.0021	0.0015	0.0016	0.0034	0.0446
	11/17/2015	0.0014	0.0012	0.0006	0.0484	0.0032
	3/16/2016	0.0018*	0.0009*	0.0014*	0.0477	0.0013*
	10/12/2016	0.0019*	0.0012*	0.0017*	0.0391	0.002*
	3/16/2017	0.001*	0.0019*	0.0009*	0.0424	0.0024*
	10/12/2017	0.0039*	0.001*	0.0019*	0.0015*	0.0044
	3/14/2018	0.0094	0.0007*	0.0063	0.0026*	0.0021*
	10/17/2018	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
	3/19/2019	0.0015	0.0021	0.0032	0.0675	0.0109
	10/16/2019	0.0011*	0.0011*	0.0008*	0.0102	0.0027*
	3/18/2020	0.003*	0.0011*	0.001*	0.0167	0.0033*
	10/16/2020	< 0.0007	0.0007*	< 0.0007	0.0069	0.0024*
	3/17/2021	0.0026*	0.0015*	0.0012*	0.0064	0.0021*
	10/20/2021	0.0015*	< 0.0007	< 0.0007	0.0034*	0.0012*
	3/17/2022	0.0011*	0.0007*	0.0014*	0.0021*	0.0036*
	10/18/2022	< 0.0007	< 0.0007	< 0.0007	0.006	0.0067
	3/14/2023	0.0034*	0.0044	0.0017*	0.0046	0.0146
	10/18/2023	0.0018*	0.0013*	0.0012*	0.0026*	0.0061
Selenium, mg/L (CAS NO - 7782-49-2)						
	12/16/2009	< 0.0002	N/A	N/A	N/A	N/A
	12/16/2009	0.0012	N/A	N/A	N/A	N/A
	1/15/2010	0.0011	N/A	N/A	N/A	N/A
	2/18/2010	0.001	< 0.0002	< 0.0002	0.0014	< 0.0002
	3/16/2010	0.0012	< 0.0002	0.0002	0.0017	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0003
	4/15/2010	0.0018	< 0.0002	< 0.0002	0.0019	0.0013
	5/17/2010	0.0015	0.0002	< 0.0002	0.0017	0.0011
	6/21/2010	0.0012	0.0002	< 0.0002	0.0007	0.0009
	7/16/2010	0.0016	0.0002	0.0004	0.0012	0.0013
	8/18/2010	0.0012	< 0.0002	0.0006	< 0.0002	0.001
	9/20/2010	0.0013	< 0.0002	0.0002	< 0.0002	0.0006
	10/18/2010	0.0012	< 0.0002	< 0.0002	< 0.0002	0.0011

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	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Selenium, mg/L (CAS NO - 7782-49-2)	11/16/2010	0.0007	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	12/16/2010	0.0021	0.0004	0.0004	0.0003	< 0.0002
	1/13/2011	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	2/16/2011	0.0022	0.0002	0.0002	0.0002	0.0012
	5/18/2011	0.0034	0.0011	0.0009	0.0008	0.0019
	8/17/2011	0.0016	< 0.0002	< 0.0002	< 0.0002	0.0084
	10/17/2011	0.0037	0.0089	0.0028	0.0209	0.0109
	1/18/2012	0.0036	< 0.0002	< 0.0002	< 0.0002	0.0049
	4/17/2012	0.0037	0.0006	< 0.0002	0.0007	0.0042
	7/17/2012	0.0032	0.0005	0.0018	0.0008	0.0006
	11/14/2012	0.0028	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	3/19/2013	0.0034	< 0.0002	< 0.0002	< 0.0002	0.0015
	6/17/2013	0.0021	< 0.0002	< 0.0002	< 0.0002	0.0029
	9/17/2013	0.0022	< 0.0002	< 0.0002	< 0.0002	0.0015
	12/17/2013	0.0032	< 0.0002	< 0.0002	< 0.0002	0.0014
	2/17/2014	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	4/15/2014	0.0032	< 0.0002	< 0.0002	< 0.0002	0.0013
	7/15/2014	0.0007	< 0.0002	< 0.0002	< 0.0002	0.0017
	10/13/2014	0.0018	< 0.0002	< 0.0002	0.0006	0.0011
	1/16/2015	0.0021	0.0005	0.0004	< 0.0002	0.0014
	5/13/2015	0.0019	< 0.0002	< 0.0002	0.0034	0.0012
	8/18/2015	0.0017	< 0.0002	< 0.0002	0.0017	0.003
	11/17/2015	0.0031	< 0.0002	< 0.0002	0.0023	< 0.0002
	3/16/2016	0.0027*	< 0.0011	< 0.0011	0.0021*	0.0018*
	10/12/2016	0.003*	< 0.0011	0.0039*	0.0027*	0.0033*
	3/16/2017	0.0025*	< 0.0011	< 0.0011	0.0015*	0.0018*
	10/12/2017	0.007	< 0.0011	< 0.0011	0.004	0.0028*
	3/14/2018	0.0022*	< 0.0011	< 0.0011	0.0018*	< 0.0011
	10/17/2018	0.0037*	0.0023*	0.0019*	0.0012*	0.0047
	3/19/2019	< 0.0011	< 0.0011	< 0.0011	0.0019	0.0044
	10/16/2019	0.0029*	< 0.0011	< 0.0011	0.0011*	0.0012*
	3/18/2020	0.0013*	< 0.0011	< 0.0011	0.0012*	0.0065
	10/16/2020	0.0017*	0.0013*	< 0.0011	0.0018*	0.0016*
	3/17/2021	< 0.0011	< 0.0011	< 0.0011	< 0.0011	< 0.0011
	10/20/2021	0.0015*	< 0.0011	< 0.0011	< 0.0011	0.0016*
	3/17/2022	0.0015*	< 0.0011	< 0.0011	< 0.0011	0.0011*
	10/18/2022	0.002*	< 0.0011	0.0024*	< 0.0011	< 0.0011
	3/14/2023	0.0037*	< 0.0011	< 0.0011	0.0056	0.0029*
	10/18/2023	0.0035*	< 0.0011	< 0.0011	0.0014*	0.0036*
Silver, mg/L (CAS NO - 7440-22-4)	12/16/2009	< 0.0012	N/A	N/A	N/A	N/A
	12/16/2009	< 0.0012	N/A	N/A	N/A	N/A
	1/15/2010	< 0.0012	N/A	N/A	N/A	N/A
	2/18/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	3/16/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	N/A
	3/23/2010	N/A	N/A	N/A	N/A	< 0.0012
	4/15/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	5/17/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	6/21/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	7/16/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	8/18/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	9/20/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	10/18/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	11/16/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	12/16/2010	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	1/13/2011	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	2/16/2011	0.00008	0.0012	0.0012	0.0012	0.0012
	5/18/2011	0.0012	0.0012	0.0012	0.0012	0.0012
	8/17/2011	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	10/17/2011	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	1/18/2012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	4/17/2012	< 0.0012	0.00009	< 0.0012	< 0.0012	< 0.0012
	7/17/2012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	11/14/2012	< 0.0012	0.0003	0.0003	0.0004	< 0.0012
	3/19/2013	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	6/17/2013	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	9/17/2013	< 0.0012	< 0.0012	< 0.0012	0.0001	< 0.0012
	12/17/2013	< 0.0012	0.0001	< 0.0012	0.0003	< 0.0012
	2/17/2014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	4/15/2014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	7/15/2014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Silver, mg/L (CAS NO - 7440-22-4)	10/13/2014	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	1/16/2015	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012
	5/13/2015	< 0.0012	< 0.0012	< 0.0012	0.0001	< 0.0012
	8/18/2015	< 0.0012	< 0.0012	< 0.0012	0.00005	0.0001
	11/17/2015	< 0.0012	0.00004	< 0.0012	0.00009	< 0.0012
	3/16/2016	< 0.00004	< 0.00004	< 0.00004	< 0.00004	< 0.00004
	10/12/2016	0.0013*	0.0014*	0.0014*	0.0014*	0.0013*
	3/16/2017	0.0004*	0.0005*	0.0004*	0.0004*	0.0004*
	10/12/2017	0.0009*	0.0009*	0.0014*	0.001*	0.0009*
	3/14/2018	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	10/17/2018	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
	3/19/2019	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
	10/16/2019	< 0.0019	< 0.0019	< 0.0019	< 0.0019	< 0.0019
	3/18/2020	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	10/16/2020	< 0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025
	3/17/2021	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	10/20/2021	< 0.0025	< 0.0002	< 0.0002	< 0.0025	< 0.0025
	3/17/2022	< 0.0008	< 0.0008	< 0.0008	< 0.0008	< 0.0008
	10/18/2022	< 0.0015	< 0.0015	0.0023	< 0.0015	< 0.0015
	3/14/2023	< 0.0015	< 0.0015	< 0.0015	< 0.0015	< 0.0015
	10/18/2023	< 0.0015	< 0.0015	0.0019*	< 0.0015	< 0.0015
Sulfate, mg/L (CAS NO - 14808-79-8)	1/15/2010	509	N/A	N/A	N/A	N/A
	2/18/2010	40.5	141	134	101	228
	3/16/2010	17.5	139	62.6	86.7	N/A
	3/23/2010	N/A	N/A	N/A	N/A	41.8
	4/15/2010	25.4	141	68	88.2	28.7
	5/17/2010	24.1	138	57.8	90.8	19.3
	6/21/2010	29.8	126	39.5	92.3	18
	7/16/2010	27.8	103	37.3	82.6	17.1
	8/18/2010	54.4	100	69	0.7	53.4
	9/20/2010	40.9	56.9	34.1	69.3	118
	10/18/2010	34	32.2	10.5	0.3	147
	11/16/2010	35.3	21.6	25.8	49.4	275
	12/16/2010	35.1	14.3	26.6	22.5	385
	1/13/2011	36.5	10.5	28.5	40	422
	2/16/2011	26.2	14.1	28.4	11.6	128
	5/18/2011	23.2	7.8	28.1	0.7	123
	8/17/2011	33.9	3	17.7	0.7	197
	1/18/2012	39.3	1.3	13.6	1	101
	4/17/2012	40.9	2.1	11.6	2.1	122
	7/17/2012	36.4	2.9	529	6.6	12.9
	11/14/2012	40.4	13.9	28.2	16.1	443
	3/19/2013	120	1.5	26.2	2.1	104
	6/17/2013	22.3	1.7	25.9	6.4	124
	9/17/2013	34.5	2.3	27.4	4.1	545
	12/17/2013	38.4	2.8	26.8	2	257
	2/17/2014	315	2.4	37.2	2.2	115
	4/15/2014	137	0.9	33.8	9.7	334
	7/15/2014	23.2	2.5	36.4	14.2	257
	10/13/2014	40	2.2	38.4	10.6	288
	1/16/2015	50.7	< 8	39.9	7.6	259
	5/13/2015	27.3	1.9	43.5	100	300
	8/18/2015	32.2	1.8	56.5	134	320
	11/17/2015	285	2.2	58	174	285
	3/16/2016	24.3	2.9	53.6	196	268
	10/12/2016	32.6	5.4	104	224	280
	3/16/2017	31.1	6.3	127	216	252
	10/12/2017	34.6	7.2	134	85.3	163
	3/14/2018	31.9	7.3	136	84.7	135
	10/17/2018	15.4	11	144	14	294
	3/19/2019	27.9	11	150	214	144
	10/16/2019	51.8	15.8	152	103	105
	3/18/2020	38.2	12.9	137	100	267
	10/16/2020	46.7	14	127	82.9	70.5
	3/17/2021	46.7	17.2	135	86.8	73.4
	10/20/2021	56.5	33.3	128	73.7	97.7
	3/17/2022	28.7	37.2	123	105	102
	10/18/2022	111	36.8	120	90.8	96.4
	3/14/2023	56	38	116	120	109
	10/18/2023	109	58.1	120	100	111

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Total Metals Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Thallium, mg/L (CAS NO - 7440-28-0)	12/16/2009	0.0118	N/A	N/A	N/A	N/A
	12/16/2009	0.0012	N/A	N/A	N/A	N/A
	1/15/2010	< 0.0002	N/A	N/A	N/A	N/A
	2/18/2010	< 0.0002	0.0012	< 0.0002	< 0.0002	< 0.0002
	3/16/2010	< 0.0002	< 0.0002	0.0019	< 0.0002	N/A
	3/23/2010	N/A	N/A	N/A	N/A	< 0.0002
	4/15/2010	< 0.0002	0.0014	0.0035	0.0017	0.0012
	5/17/2010	< 0.0002	0.0053	0.0116	0.0042	0.0019
	6/21/2010	< 0.0002	< 0.0002	0.0012	< 0.0002	< 0.0002
	7/16/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	8/18/2010	0.0003	0.0002	0.0007	< 0.0002	0.0005
	9/20/2010	< 0.0002	0.0007	0.0005	0.0002	0.0004
	10/18/2010	0.0003	0.0018	0.0005	0.0003	0.0006
	11/16/2010	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0008
	12/16/2010	0.0004	< 0.0002	< 0.0002	< 0.0002	0.0014
	1/13/2011	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0011
	2/16/2011	0.0002	0.0002	0.0002	0.0002	0.0008
	5/18/2011	0.0002	0.0002	0.0005	0.0002	0.0002
	8/17/2011	< 0.0002	< 0.0002	< 0.0002	0.001	0.0007
	10/17/2011	0.0008	< 0.0002	< 0.0002	0.0008	0.0007
	1/18/2012	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0005
	4/17/2012	< 0.0002	0.001	< 0.0002	< 0.0002	< 0.0002
	7/17/2012	< 0.0002	0.0007	0.0011	0.0006	< 0.0002
	11/14/2012	0.0004	< 0.0002	< 0.0002	< 0.0002	0.0011
	3/19/2013	< 0.0002	0.0002	< 0.0002	< 0.0002	0.0003
	6/17/2013	0.0002	0.0002	0.0002	0.0001	0.0002
	9/17/2013	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.001
	12/17/2013	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0005
	2/17/2014	0.0006	0.001	0.0003	0.0002	0.0002
	4/15/2014	0.0002	0.0008	0.0008	0.0001	0.0001
	7/15/2014	0.0001	0.0002	0.0002	0.0001	0.0002
	10/13/2014	0.0001	0.001	0.0002	0.0001	0.0006
	1/16/2015	< 0.0002	0.0004	0.0002	< 0.0002	0.0003
	5/13/2015	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0001
	8/18/2015	0.0001	0.0001	0.0001	0.0002	0.0001
	11/17/2015	< 0.0002	0.0001	0.0001	0.0001	0.0002
	3/16/2016	< 0.0001	< 0.0001	< 0.0001	0.0002*	< 0.0001
	10/12/2016	< 0.0001	< 0.0001	< 0.0001	0.0006*	< 0.0001
	3/16/2017	0.0002*	0.0005*	0.0004*	0.0013	0.0004*
	10/12/2017	0.0002*	< 0.0001	0.0003*	0.0003*	0.0005*
	3/14/2018	< 0.0001	< 0.0001	0.0001*	0.0001*	0.0001*
	10/17/2018	0.0001*	0.0001*	0.0001*	0.0001*	0.0002*
	3/19/2019	< 0.0001	< 0.0001	< 0.0001	0.001	0.0002
10/16/2019	< 0.0001	< 0.0001	< 0.0001	0.0002*	< 0.0001	
3/18/2020	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
10/16/2020	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
3/17/2021	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
10/20/2021	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
3/17/2022	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
10/18/2022	0.0004*	< 0.0004	0.0018	0.0012	0.0004*	
3/14/2023	< 0.0004	0.0009	0.0006*	< 0.0004	< 0.0004	
10/18/2023	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	
Vanadium, mg/L (CAS NO - 7440-62-2)	12/16/2009	< 0.0007	N/A	N/A	N/A	N/A
	12/16/2009	< 0.0007	N/A	N/A	N/A	N/A
	1/15/2010	< 0.0007	N/A	N/A	N/A	N/A
	2/18/2010	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	3/16/2010	0.0031	0.0049	0.0049	0.0052	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0022
	4/15/2010	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	5/17/2010	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	6/21/2010	< 0.0007	0.0034	< 0.0007	< 0.0007	< 0.0007
	7/16/2010	< 0.0007	0.0007	< 0.0007	0.0027	< 0.0007
	8/18/2010	0.0081	0.0118	0.0109	0.0033	0.0096
	9/20/2010	< 0.0007	0.0007	< 0.0007	< 0.0007	< 0.0007
	10/18/2010	< 0.0007	0.0007	< 0.0007	< 0.0007	< 0.0007
	11/16/2010	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	12/16/2010	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	1/13/2011	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	2/16/2011	0.0034	0.0021	0.0026	0.0007	0.0019
	5/18/2011	0.0007	0.0007	0.0007	0.0007	0.0007

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Vanadium, mg/L (CAS NO - 7440-62-2)	8/17/2011	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	10/17/2011	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	1/18/2012	< 0.0007	< 0.0007	< 0.0007	< 0.0007	0.0033
	4/17/2012	< 0.0007	< 0.0007	< 0.0007	< 0.0007	0.0026
	7/17/2012	0.0031	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	11/14/2012	< 0.0007	< 0.0007	< 0.0007	< 0.0007	< 0.0007
	3/19/2013	0.0068	0.0056	0.0068	< 0.0007	0.0068
	6/17/2013	0.0024	0.0005	0.0005	0.0005	0.0009
	9/17/2013	0.0005	0.0005	0.0003	0.0003	0.0015
	12/17/2013	0.0008	0.0005	0.0004	0.0013	0.0012
	2/17/2014	0.0012	0.0003	0.0003	0.0006	0.0003
	4/15/2014	0.0006	< 0.0007	< 0.0007	0.0006	0.0069
	7/15/2014	0.0005	< 0.0007	< 0.0007	0.0008	0.0087
	10/13/2014	0.0006	< 0.0007	< 0.0007	< 0.0007	0.0017
	1/16/2015	0.0006	< 0.0007	< 0.0007	0.0012	0.0011
	5/13/2015	0.0005	0.0005	0.0003	0.0013	0.0006
	8/18/2015	0.0003	0.0004	0.0003	0.0032	0.0009
	11/17/2015	0.0008	0.0007	0.0005	0.0006	0.0008
	3/16/2016	0.0007*	0.0005*	0.0011*	0.0007*	0.002*
	10/12/2016	0.0008*	0.0006*	0.0016*	0.0008*	0.0019*
	3/16/2017	0.0002*	0.0004*	0.0004*	0.0004*	0.0013*
	10/12/2017	0.001*	0.0002*	0.0007*	0.0007*	0.0011*
	3/14/2018	0.0004*	0.0002*	0.0004*	0.0004*	0.0018*
	10/17/2018	0.0002*	0.0003*	0.0003*	0.0033*	0.0129
	3/19/2019	< 0.004	0.0042	0.0052	0.063	0.0164
	10/16/2019	< 0.002	< 0.002	< 0.002	< 0.002	0.0026*
	3/18/2020	< 0.0043	< 0.0043	< 0.0043	< 0.0043	0.0175
	10/16/2020	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
	3/17/2021	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
	10/20/2021	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
	3/17/2022	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
	10/18/2022	0.0054*	0.0056*	0.0056*	0.007*	0.0049*
	3/14/2023	0.0067*	0.0051*	0.0058*	0.0088*	0.0066*
	10/18/2023	< 0.0043	< 0.0043	< 0.0043	< 0.0043	0.0095
Zinc, mg/L (CAS NO - 7440-66-6)	12/16/2009	0.12	N/A	N/A	N/A	N/A
	12/16/2009	0.12	N/A	N/A	N/A	N/A
	1/15/2010	0.0706	N/A	N/A	N/A	N/A
	2/18/2010	0.0537	0.0281	0.0361	0.0276	0.007
	3/16/2010	0.0375	0.0089	0.0076	0.0191	N/A
	3/23/2010	N/A	N/A	N/A	N/A	0.0091
	4/15/2010	0.0363	1.11	0.004	0.0477	0.0113
	5/17/2010	0.0326	0.0453	0.0106	0.0422	0.0229
	6/21/2010	0.0444	0.245	0.0088	0.134	0.0203
	7/16/2010	0.0561	0.0122	0.005	0.0742	0.0098
	8/18/2010	0.0809	0.0035	0.0043	0.0088	0.009
	9/20/2010	0.0533	0.0036	0.0083	0.0286	0.0686
	10/18/2010	0.0483	0.0029	0.0091	0.0136	0.0166
	11/16/2010	0.0714	0.0053	0.0052	0.0179	0.0065
	12/16/2010	0.139	0.009	0.008	0.0137	0.0104
	1/13/2011	0.522	0.0016	0.0054	0.0061	0.0039
	2/16/2011	0.173	0.0036	0.0037	0.0086	0.0027
	5/18/2011	0.0452	0.0023	0.003	0.0039	0.0029
	8/17/2011	0.0511	0.0023	0.007	0.0131	0.0023
	10/17/2011	0.0767	0.0116	0.0174	0.0207	0.0117
	1/18/2012	0.0377	0.0204	0.0135	0.0253	0.147
	4/17/2012	0.0391	0.0056	0.0051	0.0164	0.0032
	7/17/2012	0.111	0.002	0.0053	0.0158	0.0175
	11/14/2012	0.066	0.0267	0.0179	0.0278	0.0159
	3/19/2013	0.127	0.0119	0.0112	0.0101	0.0171
	6/17/2013	0.0877	0.0137	0.0297	0.0091	0.0598
	9/17/2013	0.0252	0.0098	0.0077	0.0061	0.0134
	12/17/2013	0.0434	0.0099	0.0138	0.0189	0.0109
	2/17/2014	0.0221	0.0156	0.009	0.0236	0.299
	4/15/2014	0.213	0.011	0.0132	0.107	0.0362
	7/15/2014	0.0481	0.008	0.0105	0.0086	0.0152
	10/13/2014	0.0937	0.0109	0.0055	0.007	0.0093
	1/16/2015	0.0589	0.007	0.0077	0.0057	0.0113
	5/13/2015	0.286	0.004	0.008	0.232	0.0042
	8/18/2015	0.0694	0.0058	0.0057	0.0156	0.233
	11/17/2015	0.131	0.0369	0.0343	0.261	0.0345

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Total Metals Constituents						
Zinc, mg/L (CAS NO - 7440-66-6)						
	3/16/2016	0.0737	0.0027*	0.0069*	0.236	< 0.002
	10/12/2016	0.128	0.003*	0.011	0.158	0.0064*
	3/16/2017	0.11	0.0062*	0.0072*	0.137	0.0081
	10/12/2017	0.342	0.0078*	0.0142	0.0359	0.0126
	3/14/2018	0.515	0.0055*	0.0067*	0.0373	0.0143
	10/17/2018	0.143	0.0103	0.0103	0.019	< 0.008
	3/19/2019	0.0786	0.0133	0.0256	0.1	0.048
	10/16/2019	0.115	0.015*	0.0105*	0.0119*	0.0126*
	3/18/2020	0.184	< 0.0174	< 0.0174	< 0.0174	< 0.0174
	10/16/2020	0.092	< 0.0174	< 0.0174	< 0.0174	< 0.0174
	3/17/2021	0.123	< 0.0174	< 0.0174	< 0.0174	< 0.0174
	10/20/2021	0.132	< 0.0174	< 0.0174	0.0218	< 0.0174
	3/17/2022	0.119	< 0.0174	0.0211	< 0.0174	< 0.0174
	10/18/2022	0.0965	< 0.0174	< 0.0174	< 0.0174	< 0.0174
	3/14/2023	0.118	0.0182*	< 0.0174	< 0.0174	< 0.0174
	10/18/2023	0.0304	< 0.0174	< 0.0174	< 0.0174	< 0.0174
Total Suspended Solids, mg/L (CAS NO - TSS)						
	3/16/2016	< 2	9	13	4	36
	10/12/2016	20	5	4	4	632
	3/16/2017	< 2	4	< 4	5	440
	10/12/2017	< 4	< 4	4	< 4	60
	3/14/2018	< 4	< 4	139	< 4	69
	10/17/2018	< 2	4	14	10	494
	3/19/2019	9	9	4	3	20
	10/16/2019	< 2	4	< 2	2	66
	3/18/2020	< 2	3	4	< 2	4
	10/16/2020	14	10	5	< 2	5
	3/17/2021	< 2	< 2	5	5	< 2
	10/20/2021	3	3	5	5	30
	3/17/2022	< 2	2	4	< 2	31
	10/18/2022	< 2	5	12	7	< 2
	3/14/2023	2	< 2	4	2	< 2
	10/18/2023	< 1	< 1	8	10	36

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

Denotes Detection.

Denotes Confirmed Outlier, Statistically Excluded.

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

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Summary of Groundwater Chemistry
BMC Aggregates L.C. South Waterloo Quarry

Appendix I VOC Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG	
Pyridine, ug/L (CAS NO - 110-86-1)	10/17/2018	< 10	< 10	< 10	< 10	< 10	
	3/19/2019	< 10	< 10	< 10	< 10	< 10	
	10/16/2019	< 10	< 10	< 10	< 10	< 10	
	3/18/2020	< 14	< 10	< 10	< 14	< 10	
	10/16/2020	< 10	< 10	< 10	< 10	< 10	
	3/17/2021	< 13	< 10	< 10	< 10	< 10	
	10/20/2021	< 10	< 10	< 10	< 10	< 10	
	3/17/2022	< 10	< 10	< 10	< 10	< 10	
	10/18/2022	< 10	< 10	< 10	< 10	< 10	
	3/14/2023	< 10	N/A	N/A	< 10	< 10	
	10/18/2023	< 10	< 10	< 13	< 10	< 10	
	2-Butanone, ug/L (CAS NO - 78-93-3)	10/17/2018	< 5	< 5	< 5	47.4	< 5
		11/14/2018	N/A	N/A	N/A	28.3	N/A
3/19/2019		< 5	< 5	< 5	< 5	< 5	
10/16/2019		< 5	< 5	< 5	< 5	< 5	
3/18/2020		< 5	< 5	< 5	< 5	< 5	
10/16/2020		< 5	< 5	< 5	< 5	< 5	
3/17/2021		< 5	< 5	< 5	< 5	< 5	
10/20/2021		< 5	< 5	< 5	< 5	< 5	
3/17/2022		< 10	< 10	< 10	< 10	< 10	
10/18/2022		< 10	< 10	< 10	< 10	< 10	
3/14/2023		< 10	< 10	< 10	< 10	< 10	
10/18/2023		< 10	< 10	< 10	< 10	< 10	
Benzene, ug/L (CAS NO - 71-43-2)		10/17/2018	< 1	< 1	< 1	< 1	< 1
	3/19/2019	< 1	< 1	< 1	< 1	< 1	
	10/16/2019	< 1	< 1	< 1	< 1	< 1	
	3/18/2020	< 1	< 1	< 1	< 1	< 1	
	10/16/2020	< 1	< 1	< 1	< 1	< 1	
	3/17/2021	< 1	< 1	< 1	< 1	< 1	
	10/20/2021	< 1	< 1	< 1	< 1	< 1	
	3/17/2022	< 1	< 1	< 1	< 1	< 1	
	10/18/2022	< 1	< 1	< 1	< 1	< 1	
	3/14/2023	< 1	< 1	< 1	< 1	< 1	
	10/18/2023	< 1	< 1	< 1	< 1	< 1	
	Chloroform, ug/L (CAS NO - 67-66-3)	10/17/2018	< 1	< 1	< 1	410	< 1
		11/14/2018	N/A	N/A	N/A	18.5	N/A
3/19/2019		< 1	< 1	< 1	80.6	< 1	
5/3/2019		N/A	N/A	N/A	9	N/A	
10/16/2019		< 1	< 1	< 1	< 1	< 1	
3/18/2020		< 1	< 1	< 1	< 1	< 1	
10/16/2020		< 1	< 1	< 1	< 1	< 1	
3/17/2021		< 1	< 1	< 1	6.8	< 1	
10/20/2021		< 1	< 1	< 1	< 1	< 1	
3/17/2022		< 1	< 1	< 1	< 1	< 1	
10/18/2022		< 1	< 1	< 1	< 1	< 1	
3/14/2023		< 1	< 1	< 1	< 1	< 1	
10/18/2023		< 1	< 1	< 1	< 1	< 1	
2-Methylphenol, ug/L (CAS NO - 95-48-7)	10/17/2018	< 10	< 10	< 10	< 10	< 10	
	11/14/2018	N/A	N/A	N/A	< 10	N/A	
	3/19/2019	< 10	< 10	< 10	< 10	< 10	
	10/16/2019	< 10	< 10	< 10	< 10	< 10	
	3/18/2020	< 13.6	< 10	< 10	< 14.4	< 10	
	10/16/2020	< 10	< 10	< 10	< 10	< 10	
	3/17/2021	< 12.8	< 10	< 10	< 10	< 10	
	10/20/2021	< 10	< 10	< 10	< 10	< 10	
	3/17/2022	< 12.5	< 10	< 10	< 13	< 10	
	10/18/2022	< 10	< 10	< 10	< 10	< 10	
	3/14/2023	< 10	N/A	N/A	< 10	< 10	
	10/18/2023	< 10	< 10	< 12.8	< 10	< 10	
	3/4-Methylphenol, ug/L (CAS NO - T-34MP)	10/17/2018	< 10	< 10	< 10	22.5	< 10
11/14/2018		N/A	N/A	N/A	< 10	N/A	
3/19/2019		< 10	< 10	< 10	< 10	< 10	
10/16/2019		< 10	< 10	< 10	< 10	< 10	
3/18/2020		< 13.6	< 10	< 10	< 14.4	< 10	
10/16/2020		< 10	< 10	< 10	< 10	< 10	
3/17/2021		< 12.8	< 10	< 10	< 10	< 10	
10/20/2021		< 10	< 10	< 10	< 10	< 10	
3/17/2022		< 12.5	< 10	< 10	< 13	< 10	
10/18/2022		< 10	< 10	< 10	< 10	< 10	

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**Summary of Groundwater Chemistry
BMC Aggregates L.C. South Waterloo Quarry**

Appendix I VOC Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
3/4-Methylphenol, ug/L (CAS NO - T-34MP)	3/14/2023	< 10	N/A	N/A	< 10	< 10
	10/18/2023	< 10	< 10	< 12.8	< 10	< 10

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

Denotes Detection.

Denotes Confirmed Outlier. Statistically Excluded.

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

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Summary of Groundwater Chemistry BMC Aggregates L.C. South Waterloo Quarry

Other Constituents	Sample Date	ReiterFarm UPG	Well#1 DNG	Well#2 DNG	Well#3 DNG	Well#4 DNG
Conductivity, uS/cm (CAS NO - COND)	10/17/2018	603	628	849	2580	1060
Total Dissolved Solids, mg/L (CAS NO - TDS)	10/17/2018	311	305	445	1370	626
	3/19/2019	311	337	469	815	492
	10/16/2019	366	308	491	458	466
	3/18/2020	343	333	493	415	736
	10/16/2020	300	291	444	409	348
	3/17/2021	365	313	483	443	604
	10/20/2021	385	303	564	481	443
	3/17/2022	359	351	536	447	429
	10/18/2022	391	339	391	392	415
	3/14/2023	360	341	456	445	479
10/18/2023	425	369	481	400	459	
Chemical Oxygen Demand, mg/L (CAS NO - COD)	3/19/2019	< 20	< 20	< 20	687	36
	10/16/2019	< 20	< 20	< 20	< 20	< 20
	3/18/2020	< 20	< 20	< 20	< 20	< 20
	10/16/2020	< 20	< 20	< 20	< 20	< 20
	3/17/2021	< 20	< 20	< 20	< 20	83
	10/20/2021	< 20	< 20	21	39	22
	3/17/2022	< 20	< 20	< 20	< 20	< 20
	10/18/2022	< 20	< 20	< 20	< 20	< 20
	3/14/2023	< 20	< 20	< 20	< 20	< 20
	10/18/2023	< 54	< 54	< 54	< 54	< 54
Total Organic Halogens, mg/L (CAS NO - TOH)	3/19/2019	0.02	0.012	0.034	0.364	0.014
	10/16/2019	< 0.01	0.021	0.011	0.131	< 0.01
	3/18/2020	0.012	< 0.01	0.01	0.024	< 0.01
	10/16/2020	< 0.01	< 0.01	0.038	0.053	< 0.01
	3/17/2021	< 0.01	< 0.01	0.011	0.02	0.031
	10/20/2021	< 0.01	< 0.01	0.015	0.103	0.014
	3/17/2022	0.025	0.018	< 0.01	0.033	< 0.01
	10/18/2022	< 0.01	0.017	0.014	0.017	0.013
	3/14/2023	< 0.01	< 0.01	< 0.01	0.021	< 0.01
	10/18/2023	< 0.01	0.018	0.016	0.054	< 0.01
Ammonia as N, mg/L (CAS NO - 7664-41-7)	3/19/2019	< 0.1	< 0.1	< 0.1	2.03	0.11
	10/16/2019	< 0.1	< 0.1	< 0.1	0.11	< 0.1
	3/18/2020	< 0.1	< 0.1	0.11	0.1	< 0.1
	10/16/2020	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	3/17/2021	< 0.1	< 0.1	< 0.1	< 0.1	0.22
	10/20/2021	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	3/17/2022	< 0.1	< 0.1	0.19	< 0.1	< 0.1
	10/18/2022	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	3/14/2023	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	10/18/2023	< 0.1	1.51	< 0.1	0.12	< 0.1
Formaldehyde, ug/L (CAS NO - 50-00-0)	3/19/2019	< 10	< 10	< 10	351	< 10
	5/3/2019	N/A	N/A	N/A	< 10	N/A
	10/16/2019	< 10	< 10	< 10	< 10	< 10
	3/18/2020	< 10	29.6	< 10	< 10	< 10
	10/16/2020	< 10	< 10	< 10	< 10	< 10
	3/17/2021	< 10	10.9	11.7	11.7	< 10
	10/20/2021	< 10	< 10	< 10	< 10	< 10
	3/17/2022	< 10	< 10	< 10	< 10	< 10
	10/18/2022	< 10	< 10	< 10	< 10	< 10
	3/14/2023	< 10	< 10	< 10	< 10	< 10
10/18/2023	< 10	< 10	< 10	< 10	< 10	
Phenols, total, mg/L (CAS NO - 108-95-2)	3/19/2019	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035
	10/16/2019	< 0.035	< 0.035	< 0.035	< 0.035	0.039
	3/18/2020	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035
	10/16/2020	0.043	< 0.035	0.082	< 0.035	< 0.035
	3/17/2021	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035
	10/20/2021	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035
	3/17/2022	< 0.035	< 0.035	< 0.035	< 0.035	< 0.035
	10/18/2022	< 0.035	0.06	< 0.035	< 0.035	< 0.035
	3/14/2023	0.057	0.06	0.06	< 0.035	< 0.035
	10/18/2023	0.082	0.047	0.066	0.063	0.035

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

Denotes Detection.

Denotes Confirmed Outlier. Statistically Excluded.

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

Appendix D
2023 Statistical Report

2023 STATISTICAL REPORT

FOR

**BMC WATERLOO SOUTH QUARRY
BENEFICIAL USE SITE**

WATERLOO, IOWA

SUBMITTAL DATE: FEBRUARY 2024

**PREPARED FOR:
BMC AGGREGATES, L.C.**

**PREPARED BY:
SCS ENGINEERS**

2023 Statistical Report

Purpose

The purpose of this document is to describe the statistical method for the evaluation of groundwater analytical data collected from the BMC Aggregates L.C. Waterloo South Quarry (South Quarry) related to the beneficial use of coal combustion residue from the University of Iowa power plant and waste foundry sand from the John Deere foundry in Waterloo, Iowa.

Monitoring Network

The monitoring network for the South Quarry currently consists of five monitoring points as listed in Table 1. Also summarized in Table 1 is the number of sampling events completed through the end of this reporting period.

Table 1
Groundwater Monitoring Summary

Monitoring Well	Monitoring Program	Number of Samples Collected
Reiter Farm (b)	Not Applicable	50
Well #1	Assessment	48
Well #2	Assessment	48
Well #3	Assessment	48
Well #4	Assessment	48

(b) denotes background monitoring point.

As selected statistical methods are intrawell, the Reiter Farm background monitoring well is not used for statistical evaluation.

Statistical Method

Diagnostic and Exploratory Evaluations and Tests of Assumptions

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

- Time Series Plots
- Shapiro-Wilk test for normality
- Ohio Environmental Protection Agency (EPA) Method for identification of outliers
- Mann-Kendall/Sen's Slope trend test

Management of Non-Detect Data

Non-detect values in the dataset are managed using simple substitution or the Kaplan-Meier estimator. If less than 15% of the data are non-detects, simple substitution is used, where non-detect values are assigned a concentration of one-half ($\frac{1}{2}$) of the practical quantification limit (PQL). If greater than 15% but less than 50% of the data are non-detects, the Kaplan-Meier estimator is used to define the distribution of the dataset. If non-detects comprise greater than 50% of the available data, non-parametric statistical methods are used.

Management of Outliers

Background datasets are evaluated for outliers using the Ohio EPA Method included in the Sanitas™ statistical software program and described below, which includes the use of Dixon's, Rosner's, and

Tukey's outlier tests, as appropriate based on the diagnostic tests, for the datasets that contain less than 75% of the measured concentrations below the PQL. Outliers are not confirmed unless a physical cause or explanation for the outlier is determined.

Management of Data (ND data < 75%)

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

- A parametric dataset with $n < 20$ is evaluated with the Dixon's outlier test.
- A parametric dataset with $n \geq 20$ is evaluated with the Rosner's outlier test.
- A non-parametric dataset is evaluated with the Tukey's outlier test.

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

Management of Data (ND data \geq 75%)

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

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

The chloride outliers identified in Well #3 from the May, August, and November 2015 sampling events, the March and October 2016 sampling events, the March 2017 sampling event, and the October 2018 sampling event were confirmed due to the fact that the well was treated with chlorine to control iron-fouling bacteria on multiple occasions. The confirmed outliers are shown in Appendix C of the Annual Water Quality Report, Summary of Groundwater Chemistry. Indicated outliers in the background monitoring well were not confirmed at this time as there was no information to link the indicated outliers to a physical cause or explanation.

Assessment Monitoring Statistical Program

Confidence intervals or confidence bands, as appropriate, were selected as the appropriate statistical methods for comparison of the groundwater analytical data against a fixed groundwater protection standard (GWPS). The assessment monitoring statistical evaluations are performed using the most recent eight samples or all samples if less than eight samples are available. The confidence intervals or confidence bands used for the assessment monitoring statistical evaluation are established using the process below. Transformation of the distribution is not considered.

Confidence Intervals or Confidence Bands

- A parametric confidence interval around a normal mean is calculated if the dataset has a normal distribution and no statistically significant trend is present.

- A non-parametric confidence interval around a median is calculated if the dataset does not have a normal distribution and no statistically significant trend is present.
- Non-parametric confidence bands around a Theil-Sen trend line are calculated if the dataset has a statistically significant trend.

If the lower confidence limit or any part of the lower confidence band, as appropriate, exceeds the GWPS, then the monitoring point is considered to have exceeded a GWPS at a statistically significant level (SSL).

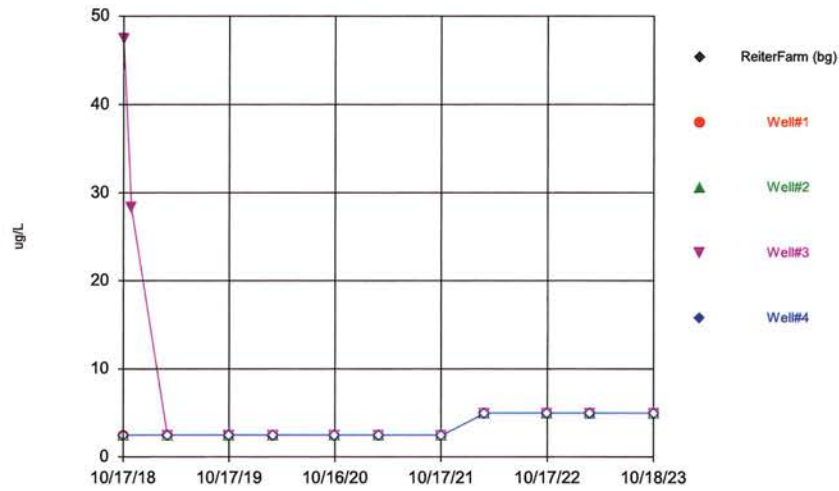
Statistical Evaluation

The reporting period for this statistical evaluation is January to December 2023 and includes data from the March 14 and October 18, 2023 semi-annual sampling events. Listed below are the statistical outputs attached to this report. Sanitas™ statistical software was used to perform the statistical analyses.

- Attachment A Time Series Plots
- Attachment B Outlier Test Summary Table and Graphs
- Attachment C Mann-Kendall/Sen's Slope Trend Test Summary Table and Graphs
- Attachment D Confidence Interval Summary Table and Graphs
- Attachment E Theil-Sen Trend Line and Confidence Bands Summary Table and Graphs

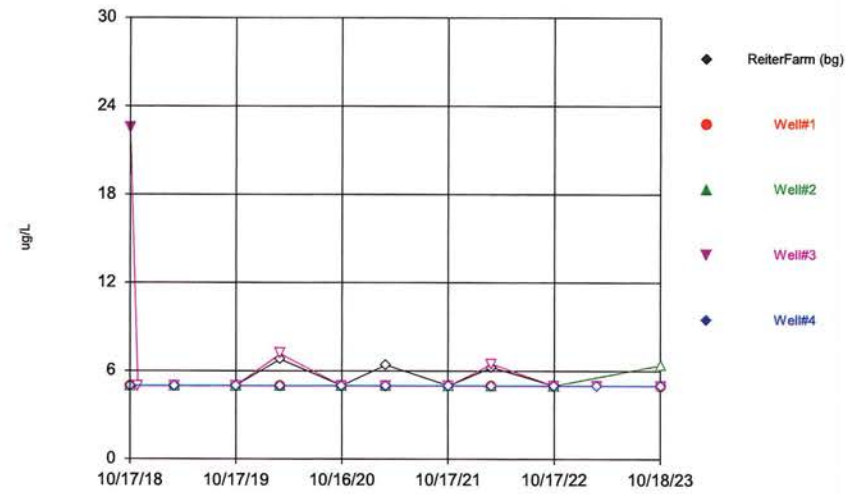
Attachment A
Time Series Plots

Time Series



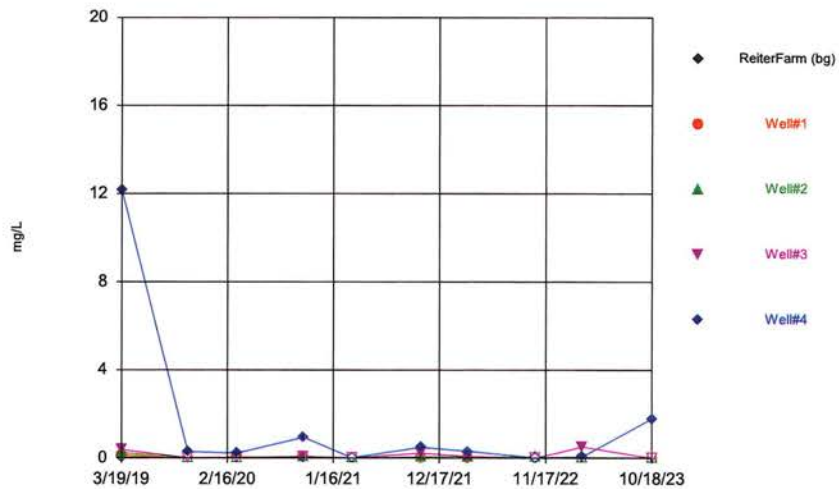
Constituent: 2-Butanone Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



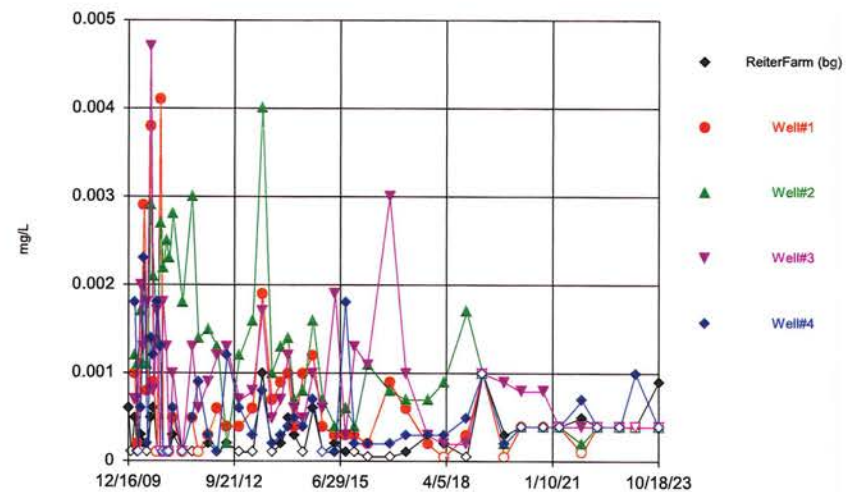
Constituent: 3/4-Methylphenol Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
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Time Series



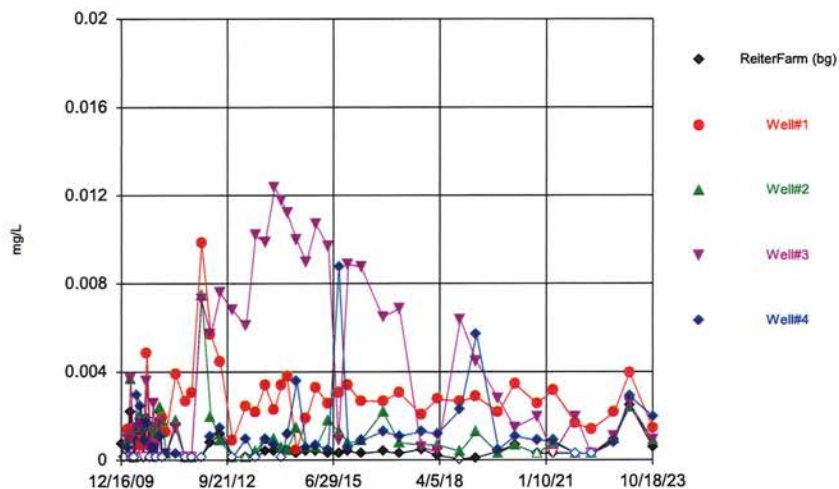
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Time Series



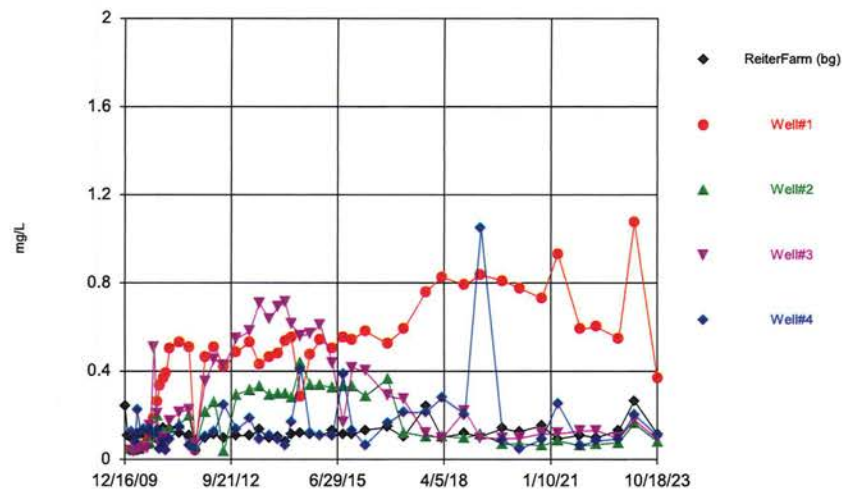
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Time Series



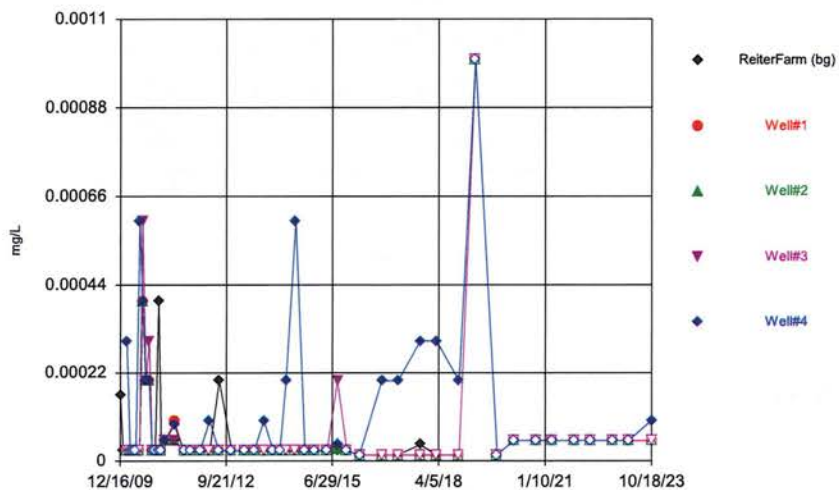
Constituent: Arsenic Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



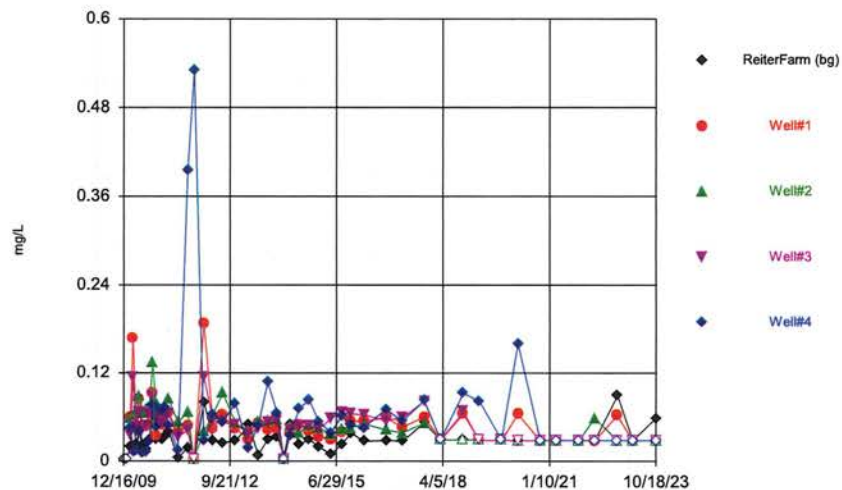
Constituent: Barium Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



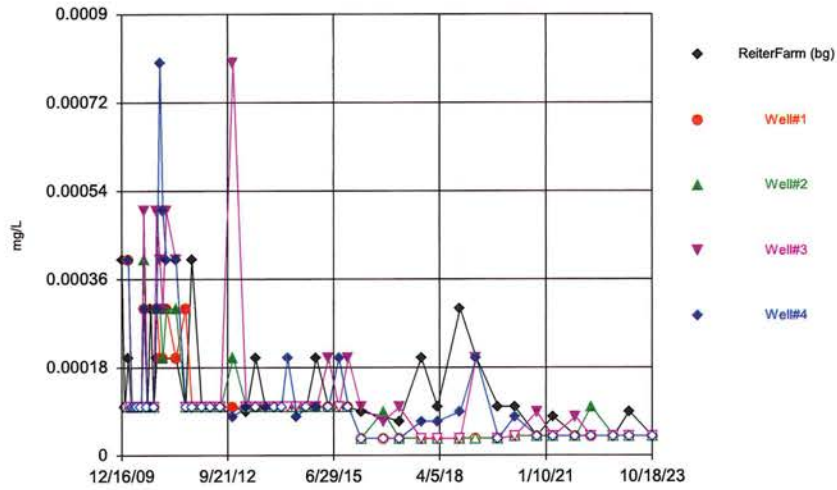
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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



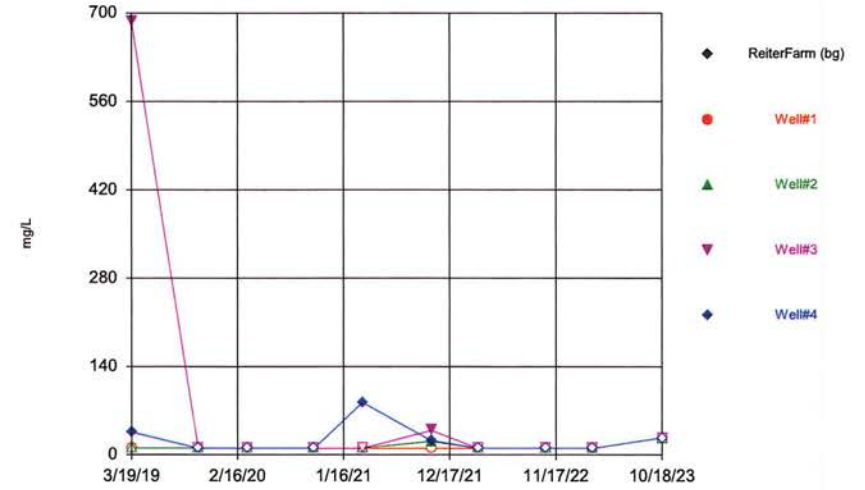
Constituent: Boron Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



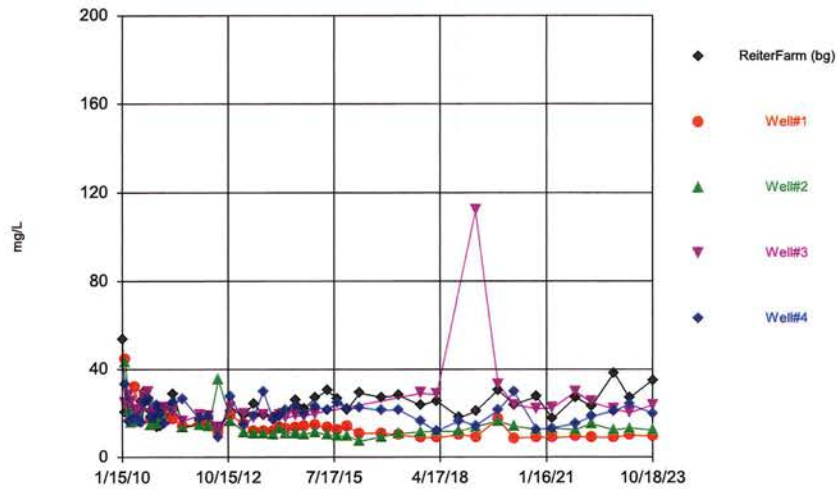
Constituent: Cadmium Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



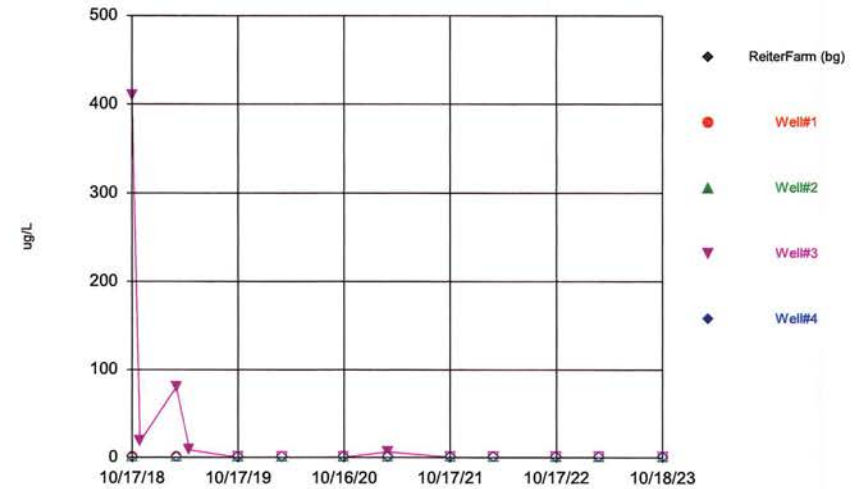
Constituent: Chemical Oxygen Demand Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



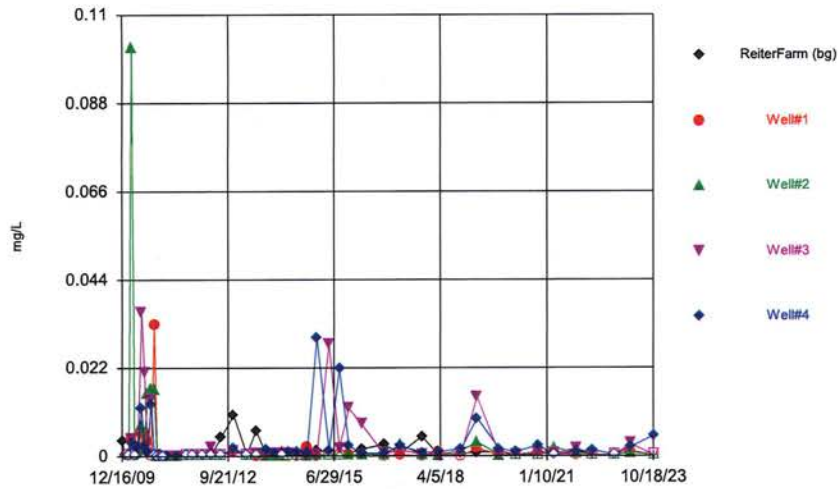
Constituent: Chloride Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



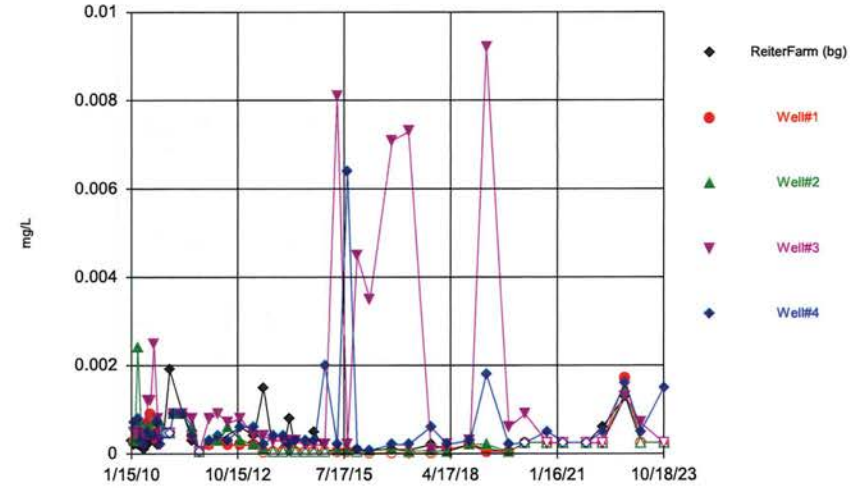
Constituent: Chloroform Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



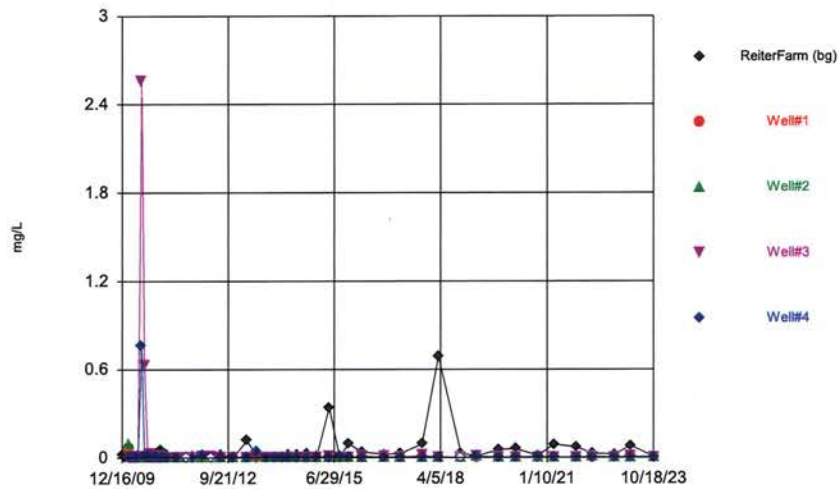
Constituent: Chromium Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



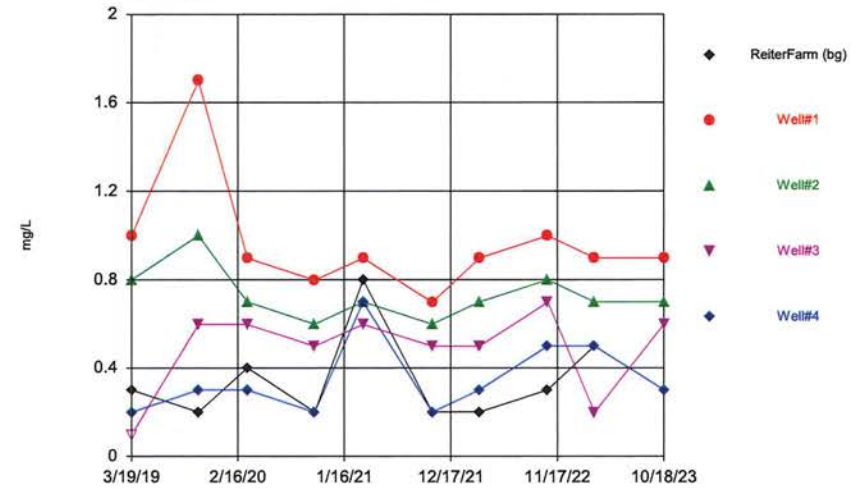
Constituent: Cobalt Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



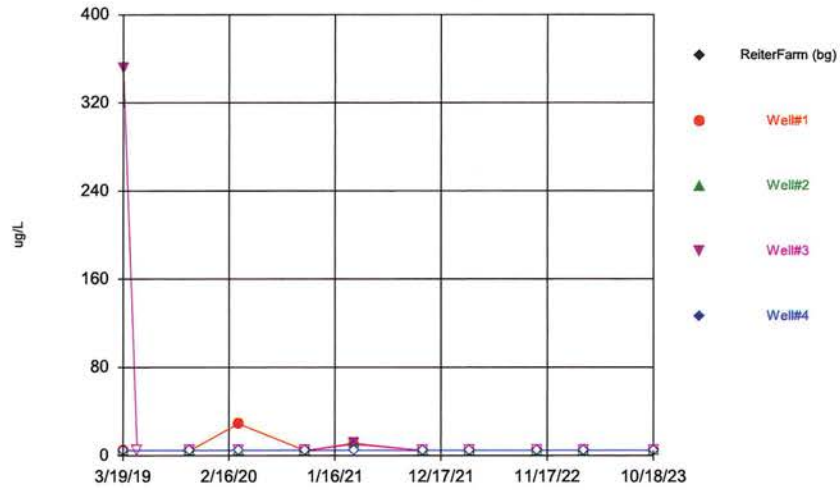
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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



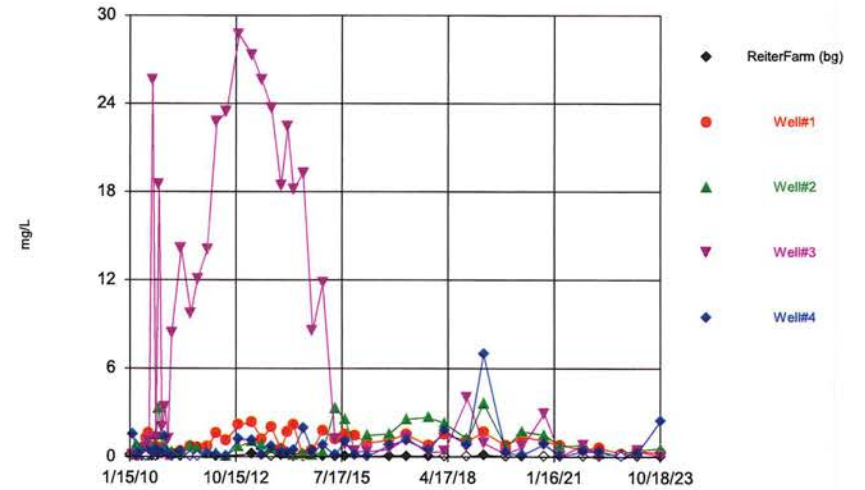
Constituent: Fluoride Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



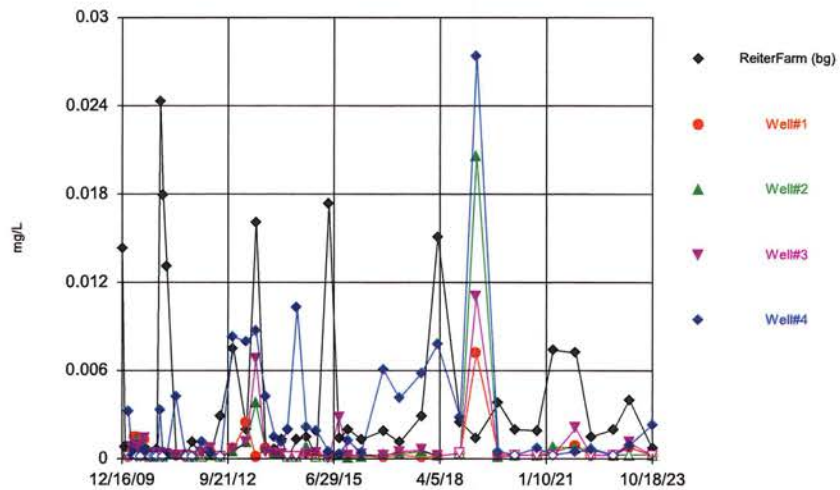
Constituent: Formaldehyde Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



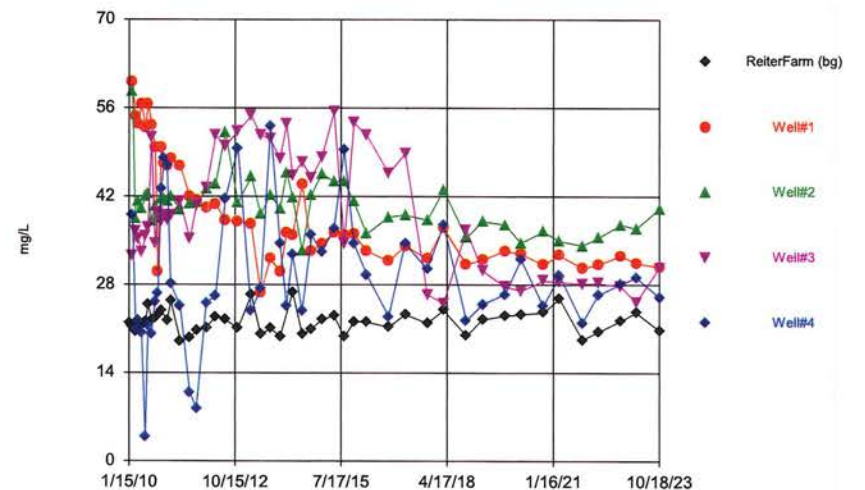
Constituent: Iron Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



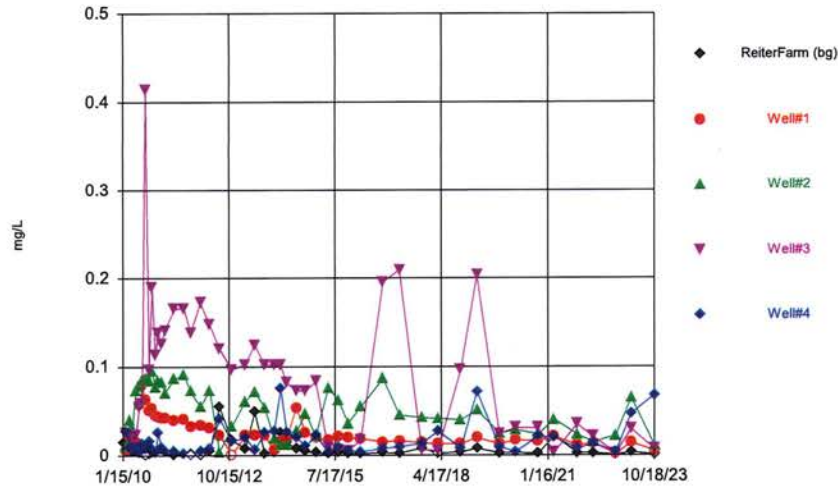
Constituent: Lead Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



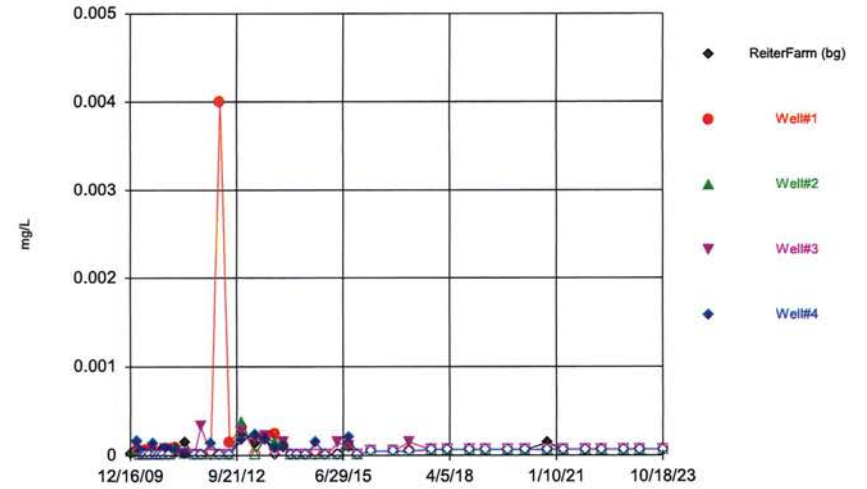
Constituent: Magnesium Analysis Run 12/21/2023 3:59 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



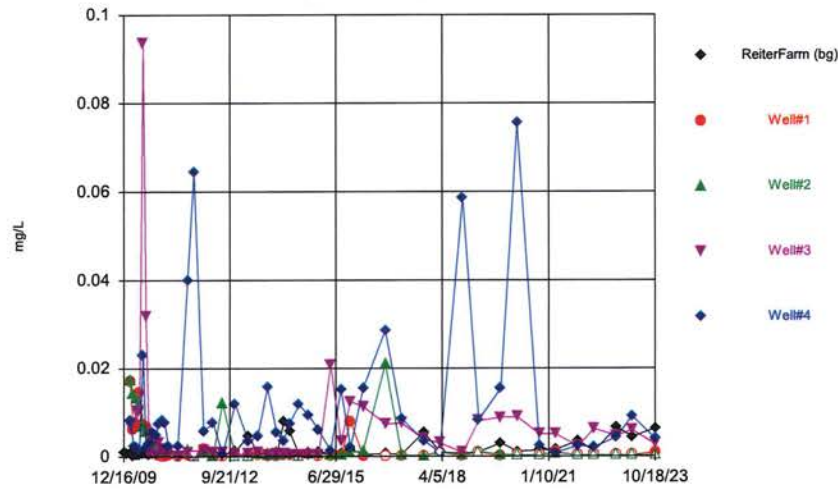
Constituent: Manganese Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



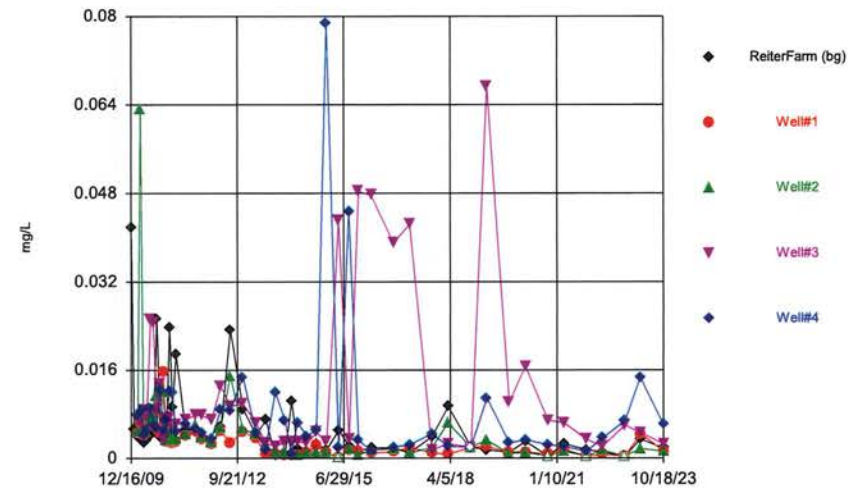
Constituent: Mercury Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



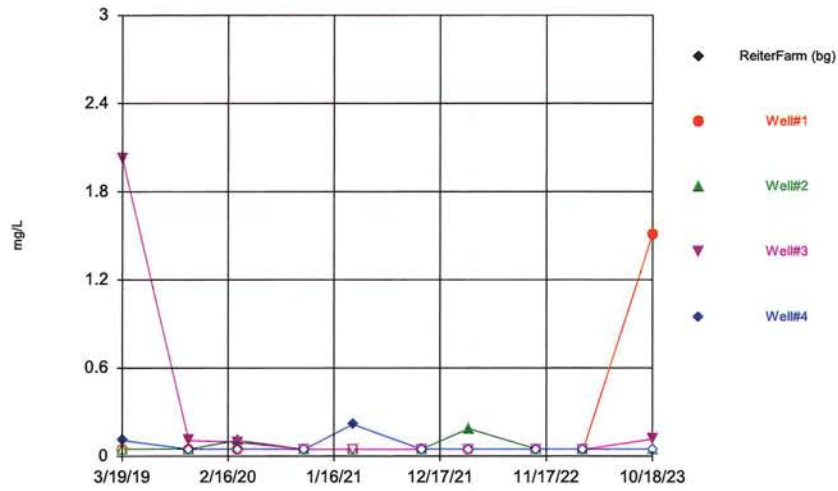
Constituent: Molybdenum Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



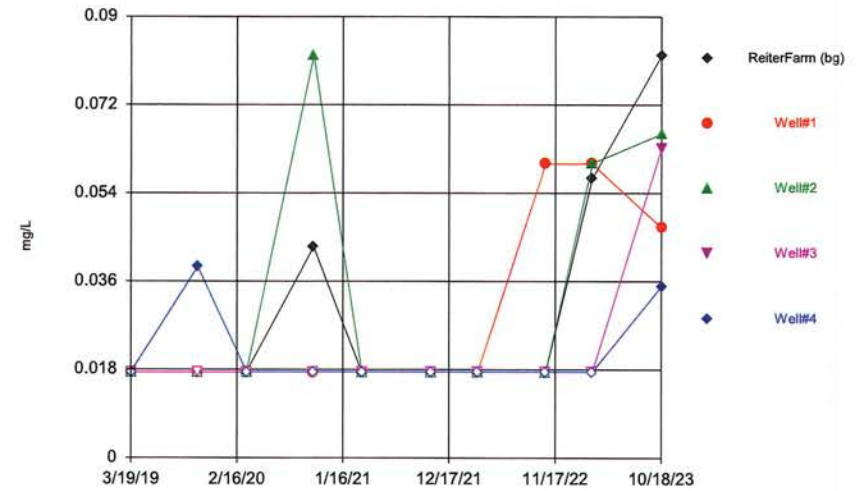
Constituent: Nickel Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



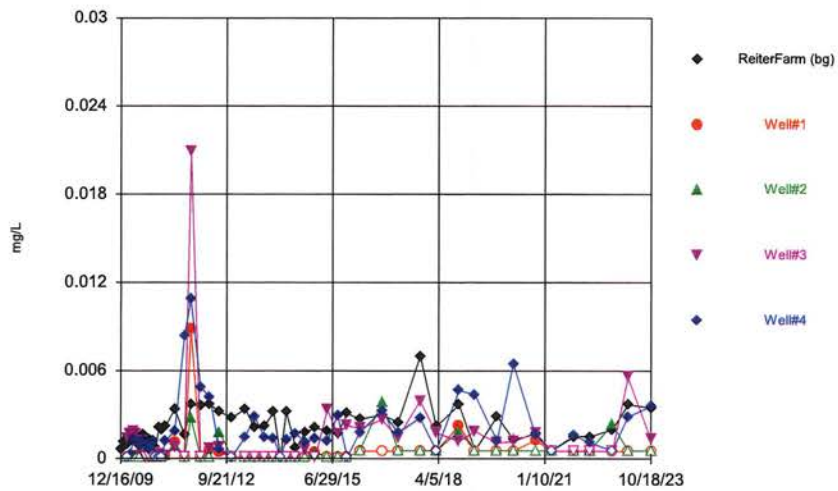
Constituent: Nitrogen, Ammonia Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



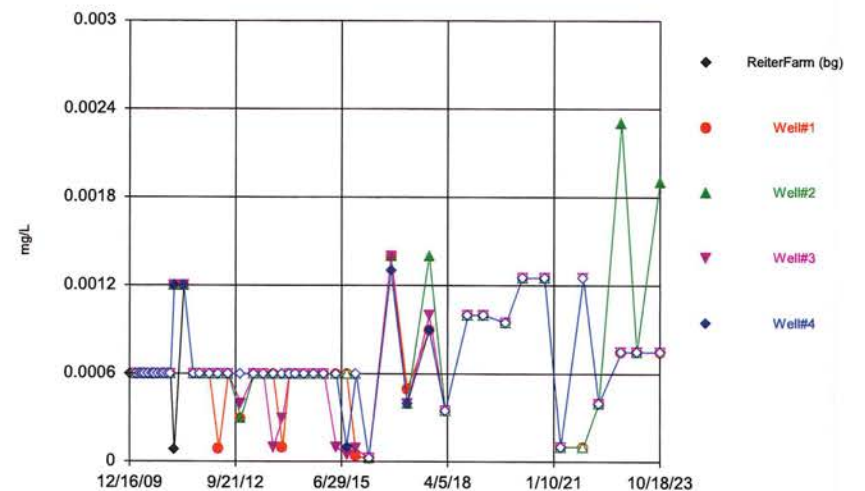
Constituent: Phenols, total Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



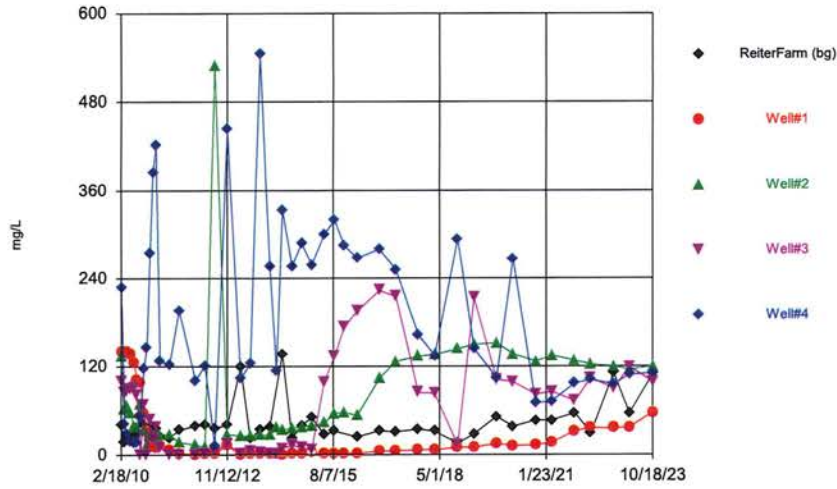
Constituent: Selenium Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



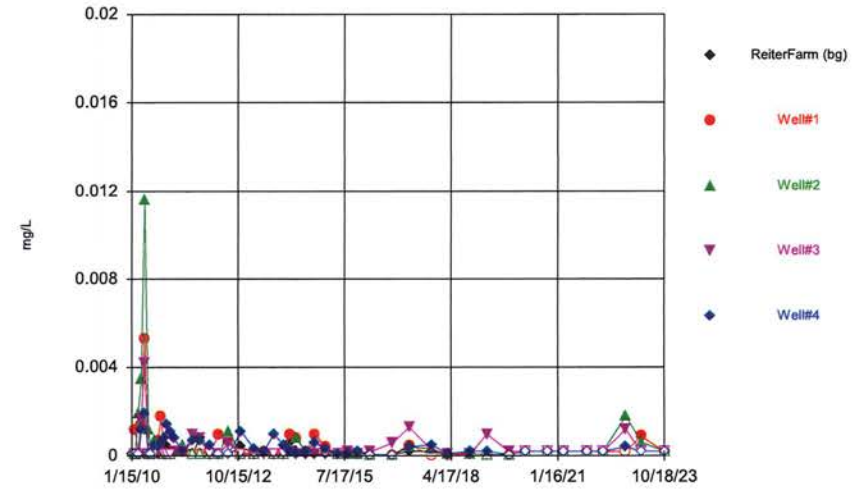
Constituent: Silver Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



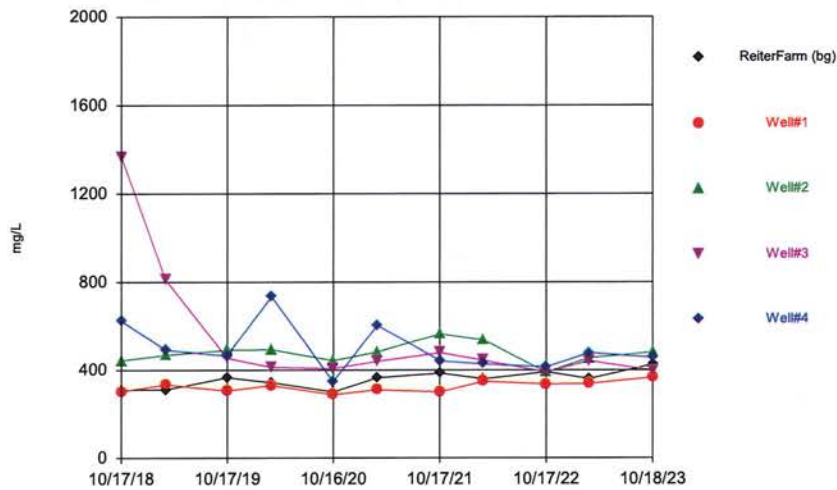
Constituent: Sulfate Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



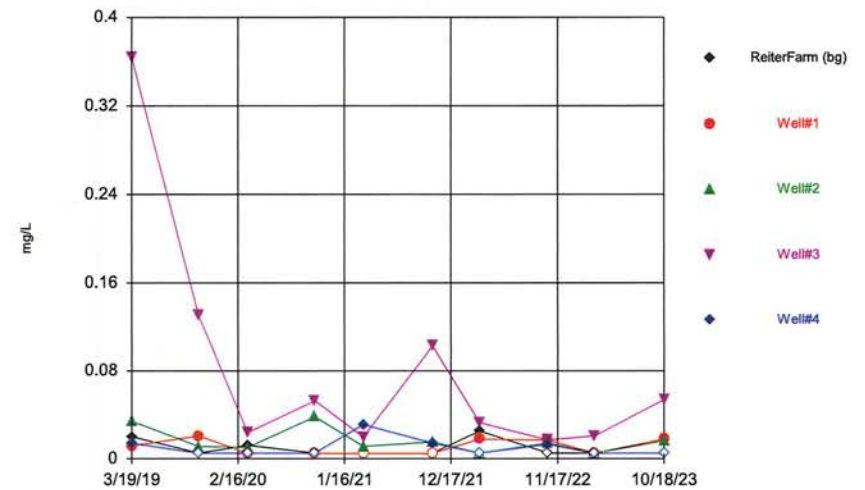
Constituent: Thallium Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



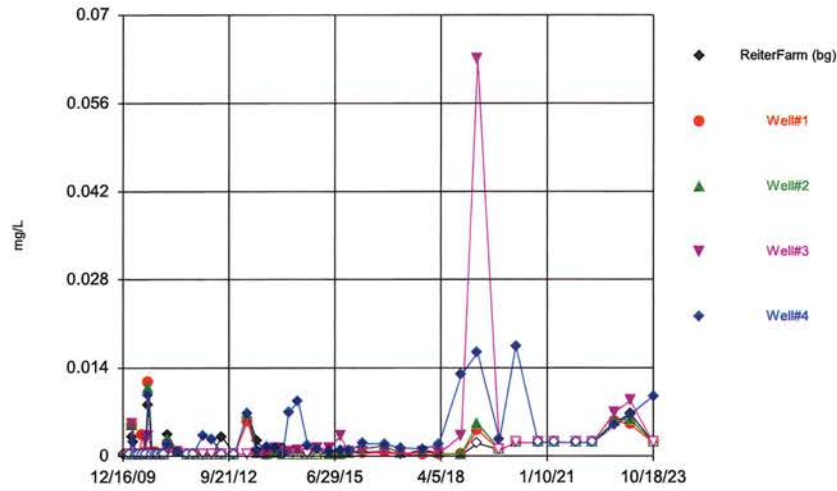
Constituent: Total Dissolved Solids Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



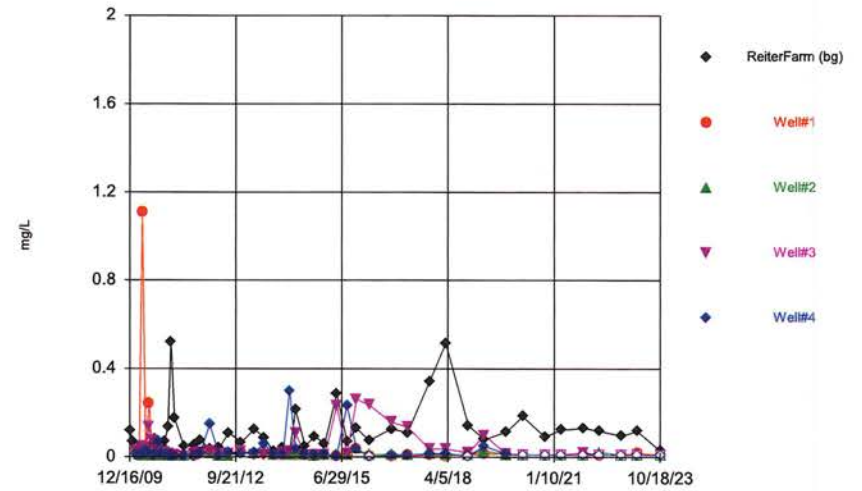
Constituent: Total Organic Halogens Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



Constituent: Vanadium Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Time Series



Constituent: Zinc Analysis Run 12/21/2023 4:00 PM View: 2023AWQR - Time Series
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

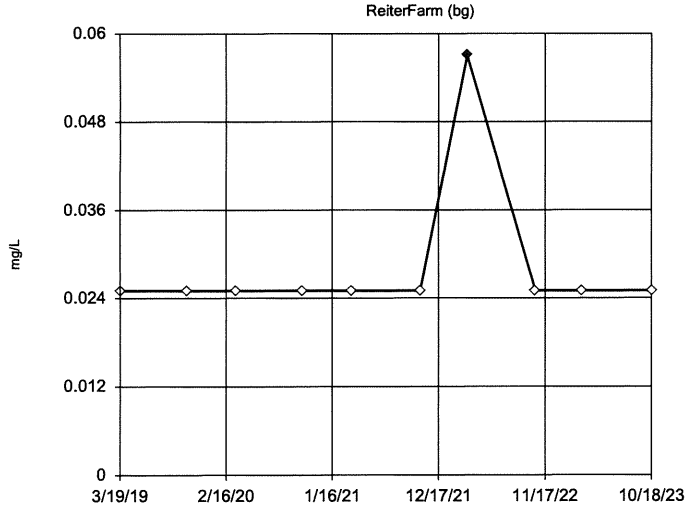
Attachment B
Outlier Tests Summary Table and Graphs

Outlier Analysis

BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master Printed 12/21/2023, 4:23 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Aluminum (mg/L)	ReiterFarm (bg)	Yes	0.057	3/17/2022	OH	NaN	10	0.0282	0.01012	n/a
Antimony (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	50	0.000279	0.0002414	ShapiroFrancia
Arsenic (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.0005375	0.0005672	ShapiroFrancia
Barium (mg/L)	ReiterFarm (bg)	Yes	0.267,0.241,0.241	3/14/2023,12/16/2009,10/12/2017	Rosner/OH	0.01	50	0.122	0.03615	ShapiroWilk
Beryllium (mg/L)	ReiterFarm (bg)	Yes	0.001,0.0004,0.0004,0.0002,0.0002...	3/19/2019,7/16/2010,12/16/2010,8/18/2010,9/20/201	OH	NaN	50	0.00007685	0.0001575	n/a
Boron (mg/L)	ReiterFarm (bg)	Yes	0.08,0.089	1/18/2012,10/18/2022	NP (nrm)/OH	NaN	50	0.03004	0.01792	ShapiroFrancia
Cadmium (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	47	0.0001319	0.00008624	ShapiroWilk
Chloride (mg/L)	ReiterFarm (bg)	Yes	53.6	1/15/2010	Rosner/OH	0.01	48	23.56	7.101	ShapiroWilk
Chromium (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.001342	0.001858	ShapiroFrancia
Cobalt (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	46	0.0003298	0.0003869	ShapiroWilk
Copper (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.04511	0.107	ShapiroFrancia
Fluoride (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	10	0.34	0.1897	ShapiroWilk
Iron (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	43	0.0699	0.07461	ShapiroWilk
Lead (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.003772	0.005754	ShapiroFrancia
Magnesium (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	47	22.17	1.823	ShapiroWilk
Manganese (mg/L)	ReiterFarm (bg)	Yes	0.0548,0.049,0.0258,0.0211	7/17/2012,6/17/2013,2/17/2014,3/17/2021	NP (nrm)/OH	NaN	46	0.007063	0.01105	ShapiroWilk
Mercury (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	50	0.0000516	0.00005015	ShapiroFrancia
Molybdenum (mg/L)	ReiterFarm (bg)	Yes	0.0047,0.0078,0.0057,0.0055,0.006...	3/19/2013,2/17/2014,4/15/2014,10/12/2017,10/18/20	NP (nrm)/OH	NaN	50	0.001553	0.001895	ShapiroFrancia
Nickel (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.00571	0.007817	ShapiroFrancia
Selenium (mg/L)	ReiterFarm (bg)	Yes	0.007	10/12/2017	Rosner/OH	0.01	50	0.002171	0.001216	ShapiroWilk
Silver (mg/L)	ReiterFarm (bg)	No	n/a	n/a	OH	NaN	50	0.000658	0.0002691	n/a
Sulfate (mg/L)	ReiterFarm (bg)	Yes	120,137,111,109	3/19/2013,4/15/2014,10/18/2022,10/18/2023	NP (nrm)/OH	NaN	45	42.44	26.32	ShapiroWilk
Thallium (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	49	0.0001724	0.0001425	ShapiroWilk
Titanium (mg/L)	ReiterFarm (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	50	0.001425	0.001825	ShapiroFrancia
Zinc (mg/L)	ReiterFarm (bg)	No	n/a	n/a	EPA/OH	0.05	50	0.1114	0.1049	ShapiroFrancia

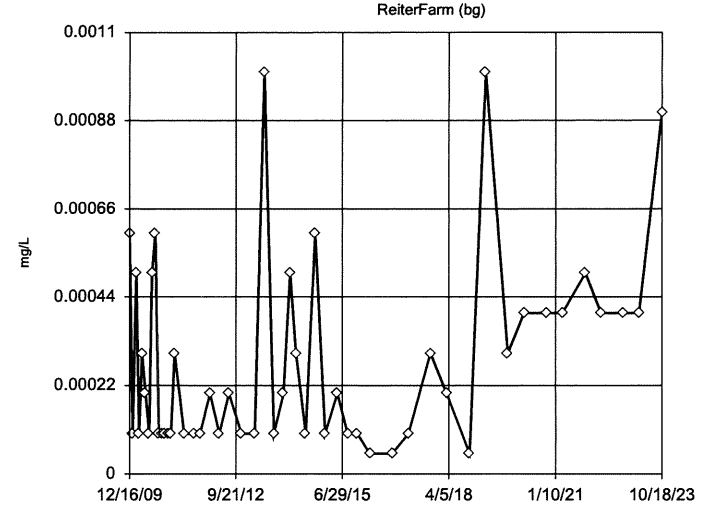
Ohio EPA 0715 Outlier Algorithm



n = 10
 Statistical outlier is drawn as solid.
 Outlier per Ohio method.

Constituent: Aluminum Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

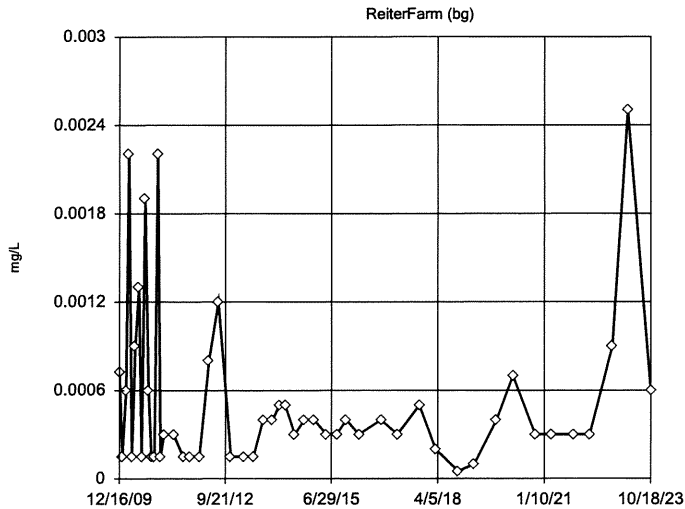
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 50
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Francia normally test failed at the 0.01 alpha level.
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Antimony Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

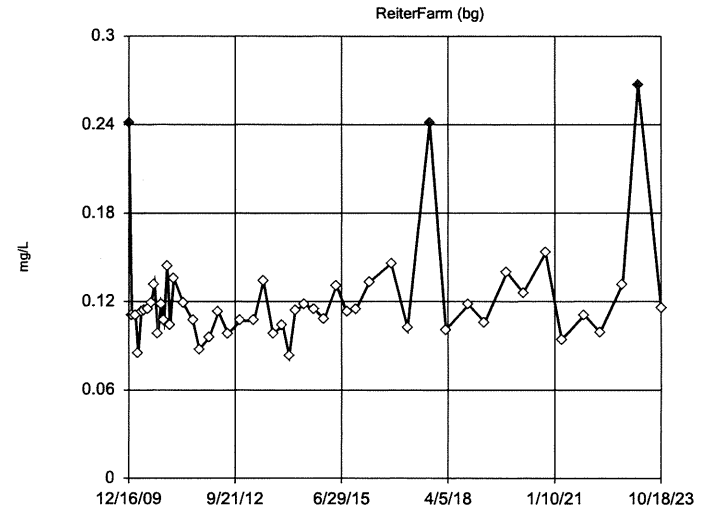
EPA Screening (suspected outliers for Rosner's Test)



n = 50
 Rosner's will not be run.
 No suspect values identified or unable to establish suspect values.
 Ohio method in use.
 Mean 0.0005375, std. dev. 0.0005672, critical Tn 2.956
 Normality test used:
 Shapiro Francia@alpha = 0.01
 Calculated = 0.95
 Critical = 0.935 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Arsenic Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Rosner's Outlier Test / Ohio EPA 0715 Outlier Algorithm

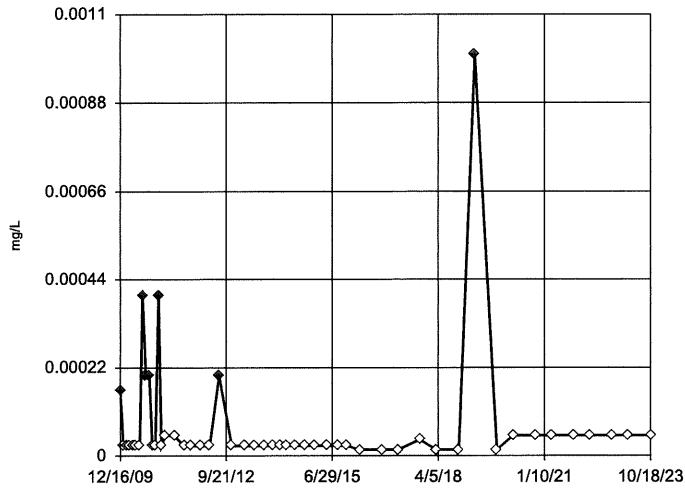


n = 50
 Statistical outliers are drawn as solid.
 k = 5
 r = 5.155
 Tabulated value = 2.94
 Alpha = 0.01
 Normality test used:
 Shapiro Wilk@alpha = 0.01
 Calculated = 0.9656
 Critical = 0.928
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Barium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

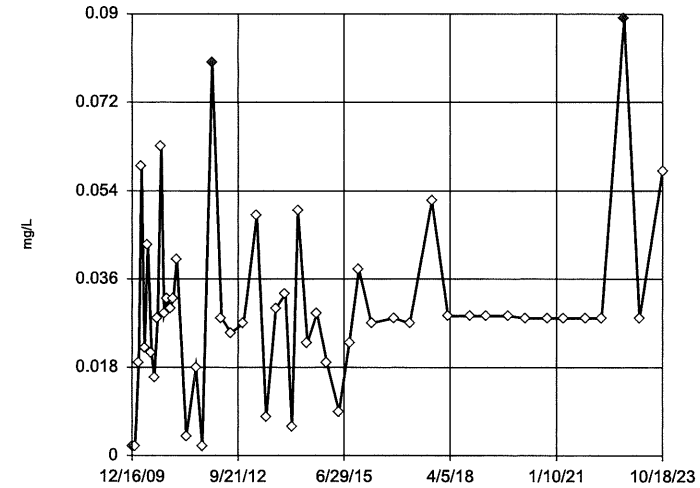


n = 50
 Statistical outliers are drawn as solid.
 Outliers per Ohio method.

Constituent: Beryllium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Santas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

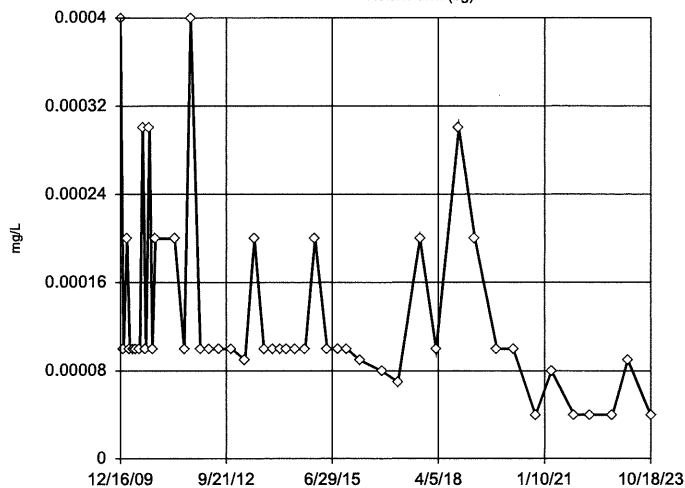


n = 50
 Outliers are drawn as solid.
 Tukey's method used in lieu of parametric test because the Shapiro Francis normality test failed at the 0.01 alpha level.
 High cutoff = 0.0655, low cutoff = -0.0115, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Santas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

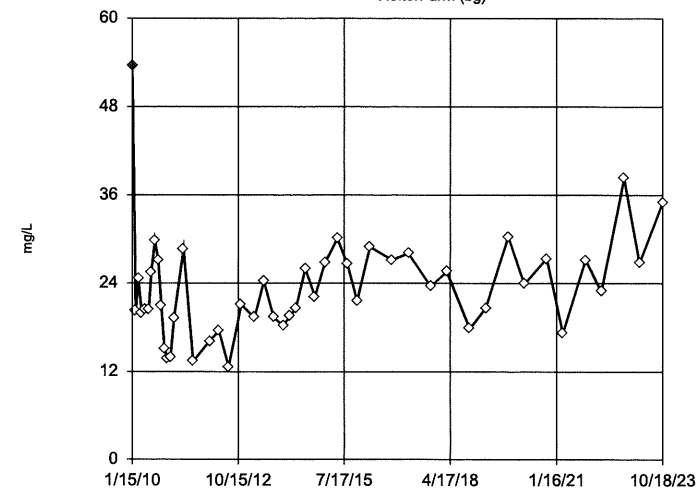


n = 47
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.
 High cutoff = 0.0005, low cutoff = -0.0002, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Santas ISU CCR master

Rosner's Outlier Test / Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

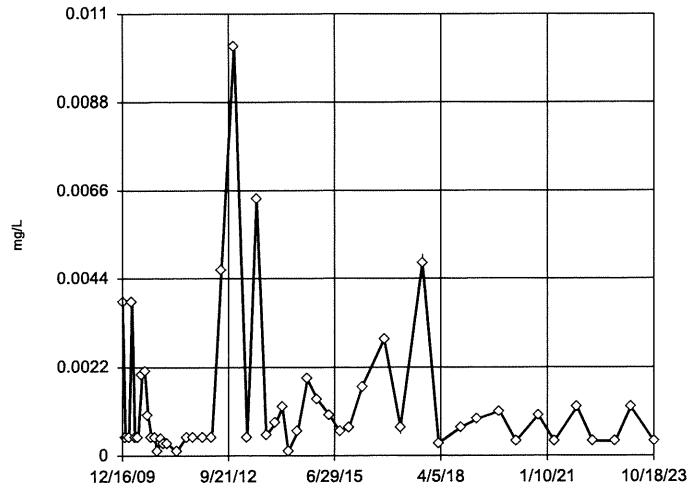


n = 48
 Statistical outlier is drawn as solid.
 k = 1
 r = 4.23
 Tabulated value = 3.06
 Alpha = 0.01
 Normality test used: Shapiro Wilk@alpha = 0.01
 Calculated = 0.3732
 Critical = 0.928
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Chloride Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Santas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)

ReiterFarm (bg)

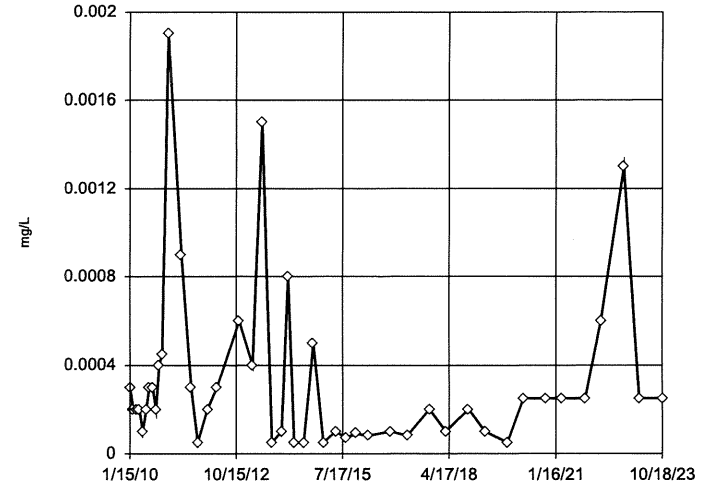


n = 50
 Rosner's will not be run.
 No suspect values identified or unable to establish suspect values.
 Ohio method in use.
 Mean 0.001342, std. dev. 0.001858, critical Tn 2.956
 Normality test used:
 Shapiro Francia@alpha = 0.01
 Calculated = 0.9449
 Critical = 0.935 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Chromium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)

ReiterFarm (bg)

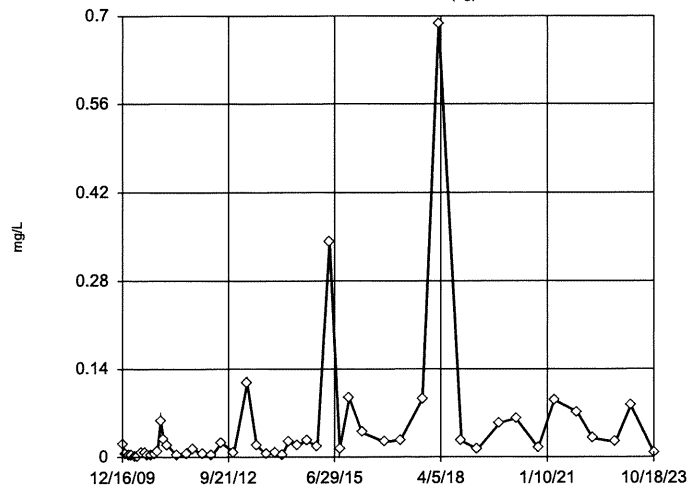


n = 46
 Rosner's will not be run.
 No suspect values identified or unable to establish suspect values.
 Ohio method in use.
 Mean 0.0003298, std. dev. 0.0003869, critical Tn 2.923
 Normality test used:
 Shapiro Wilk@alpha = 0.01
 Calculated = 0.9429
 Critical = 0.927 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Cobalt Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)

ReiterFarm (bg)

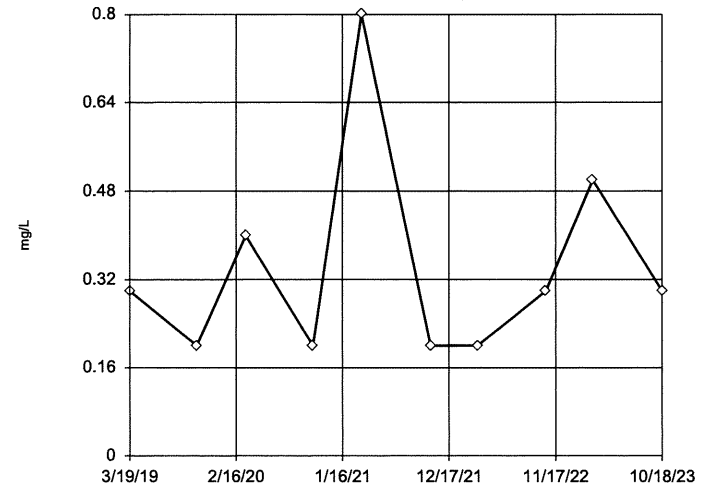


n = 50
 Rosner's will not be run.
 No suspect values identified or unable to establish suspect values.
 Ohio method in use.
 Mean 0.04511, std. dev. 0.107, critical Tn 2.956
 Normality test used:
 Shapiro Wilk@alpha = 0.01
 Calculated = 0.9678
 Critical = 0.935 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Copper Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Dixon's Test)

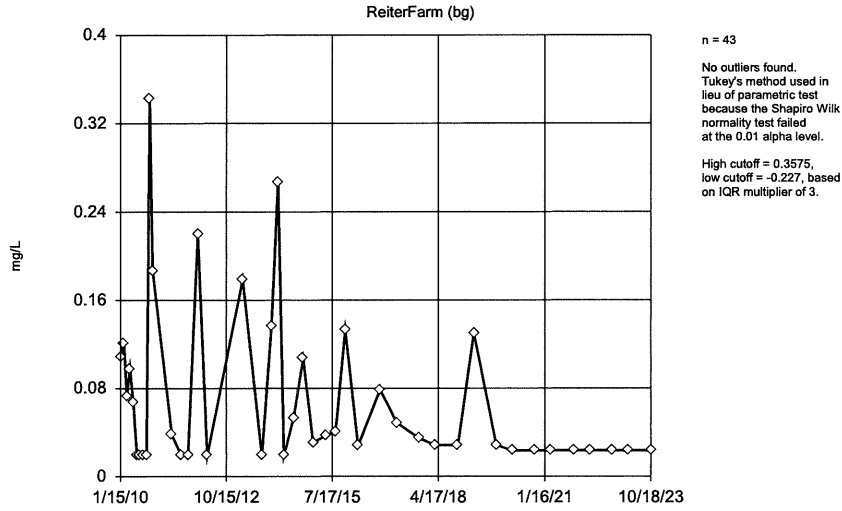
ReiterFarm (bg)



n = 10
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Ohio method in use.
 Mean 0.34, std. dev. 0.1897, critical Tn 2.176
 Normality test used:
 Shapiro Wilk@alpha = 0.01
 Calculated = 0.8555
 Critical = 0.781 (after natural log transformation)
 The distribution was found to be log-normal.

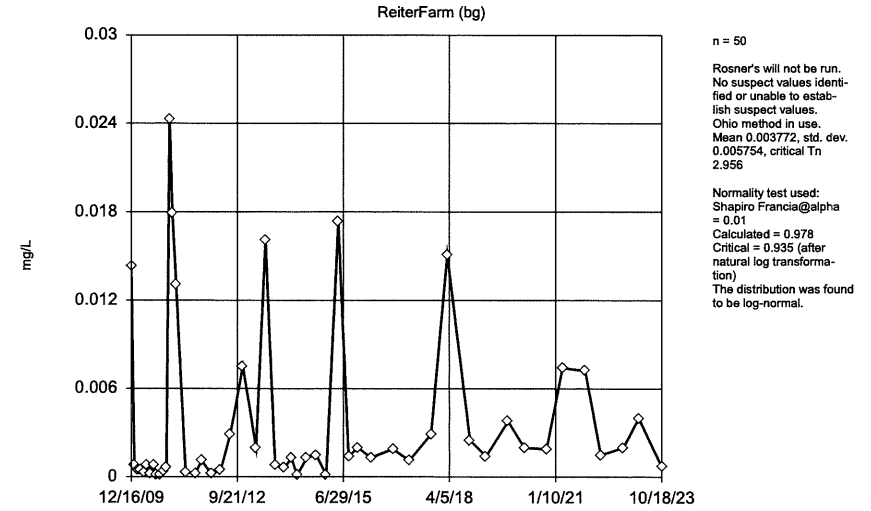
Constituent: Fluoride Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



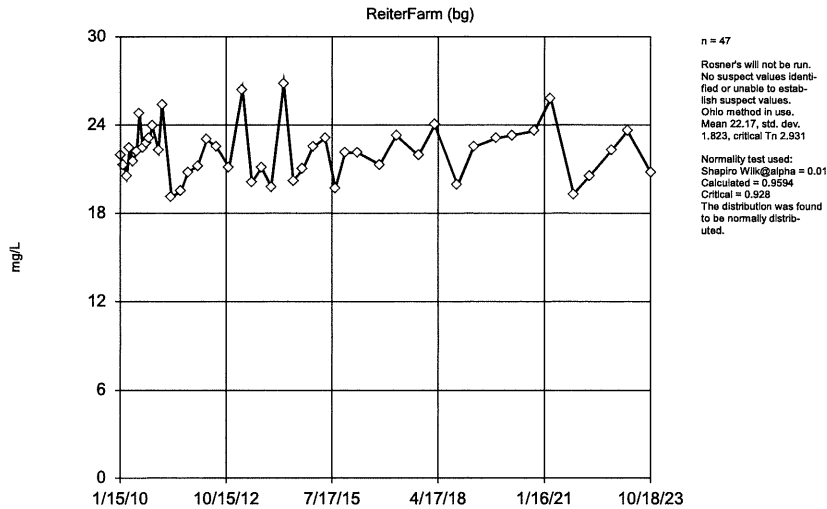
Constituent: Iron Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)



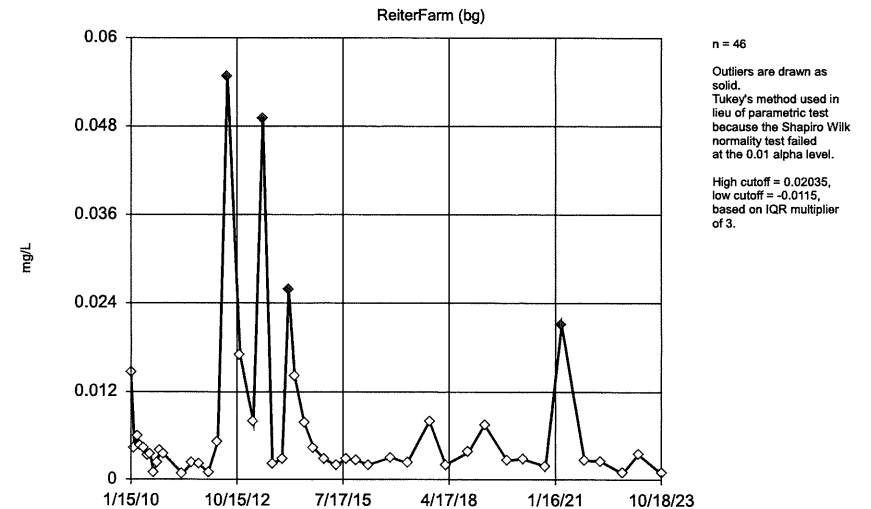
Constituent: Lead Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)



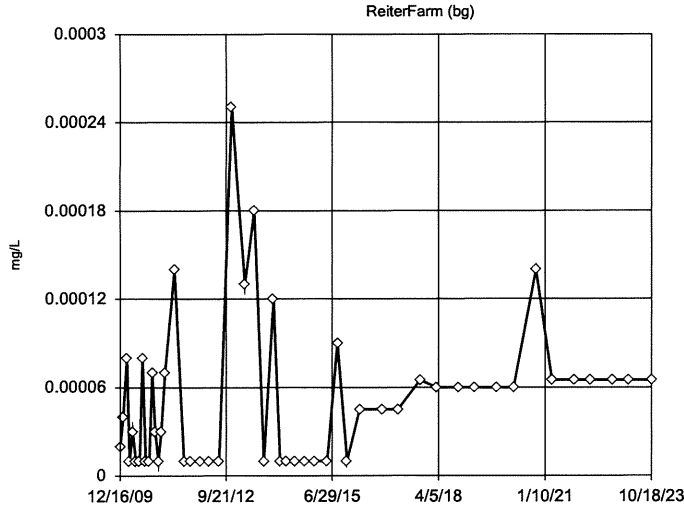
Constituent: Magnesium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



Constituent: Manganese Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

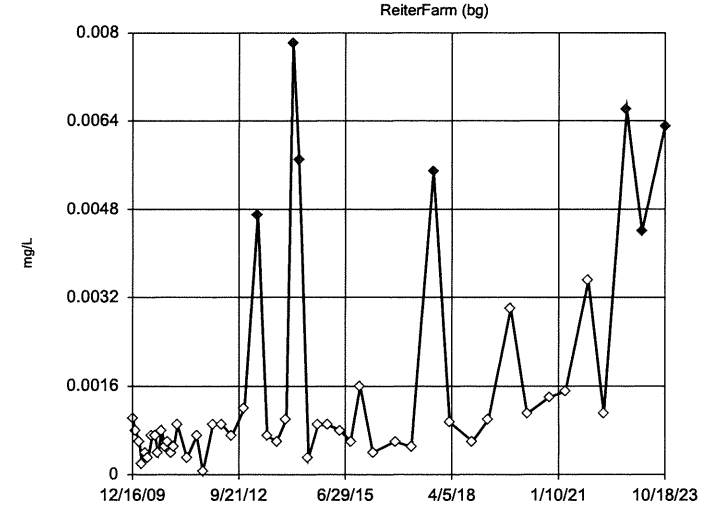
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 50
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Francia normally test failed at the 0.01 alpha level.
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Mercury Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

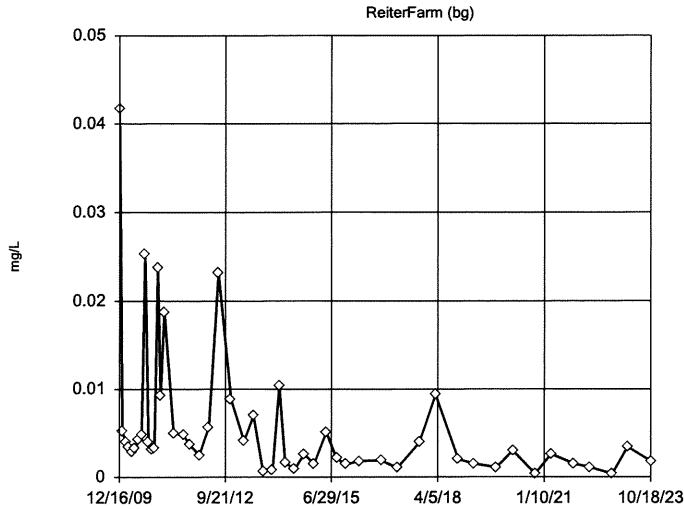
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 50
 Outliers are drawn as solid.
 Tukey's method used in lieu of parametric test because the Shapiro Francia normally test failed at the 0.01 alpha level.
 High cutoff = 0.00355, low cutoff = -0.0017, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

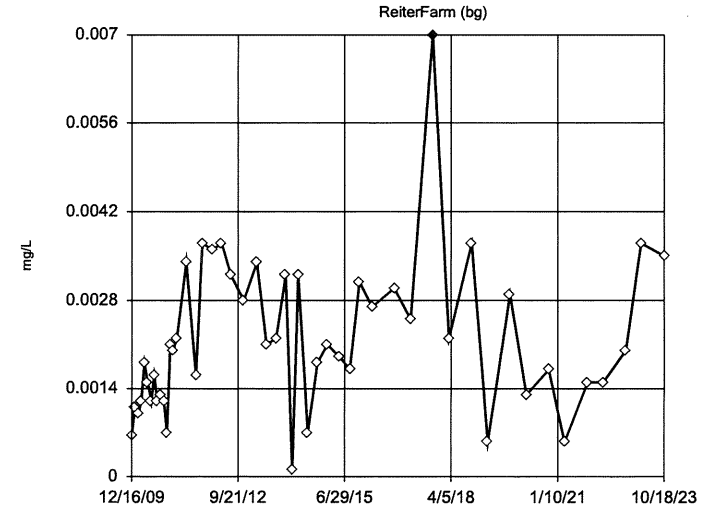
EPA Screening (suspected outliers for Rosner's Test)



n = 50
 Rosner's will not be run. No suspect values identified or unable to establish suspect values. Ohio method in use. Mean 0.00571, std. dev. 0.007817, critical Tn 2.956
 Normality test used: Shapiro Francia@alpha = 0.01
 Calculated = 0.9755
 Critical = 0.935 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Nickel Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Rosner's Outlier Test / Ohio EPA 0715 Outlier Algorithm

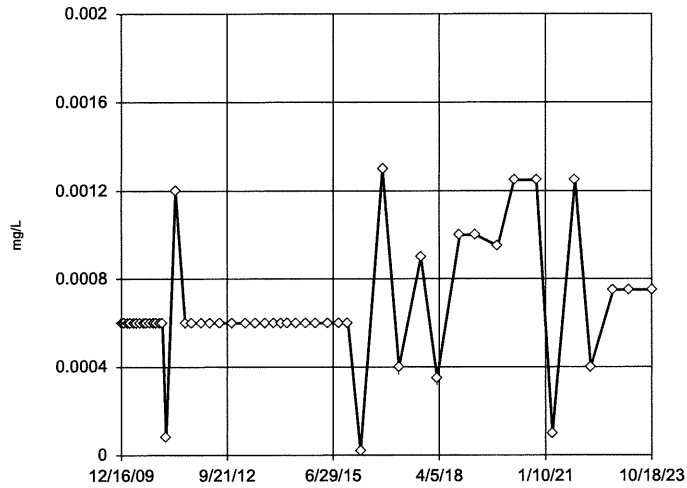


n = 50
 Statistical outlier is drawn as solid.
 k = 1
 r = 3.973
 Tabulated value = 3.08
 Alpha = 0.01
 Normality test used: Shapiro Wilk@alpha = 0.01
 Calculated = 0.9403
 Critical = 0.929 (after natural log transformation)
 The distribution, after removal of suspect value, was found to be log-normal.

Constituent: Selenium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

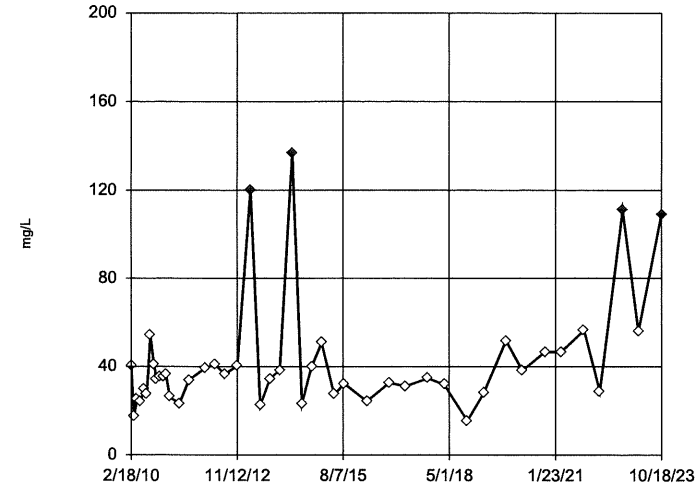


n = 50
No statistical outliers.

Constituent: Silver Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

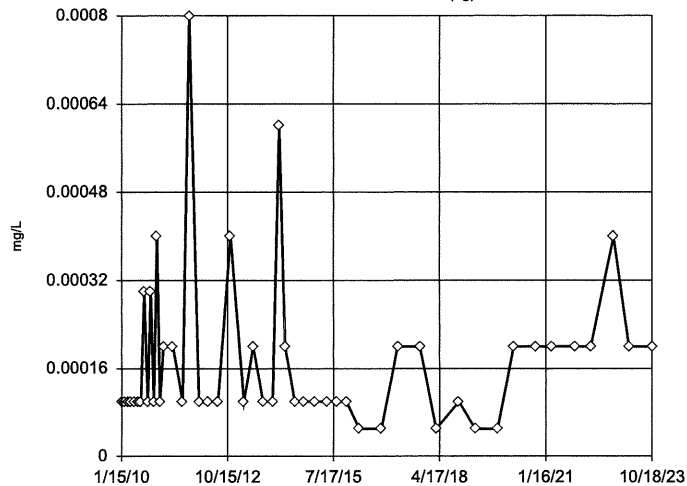


n = 45
Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.
High cutoff = 91.65, low cutoff = -20, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

ReiterFarm (bg)

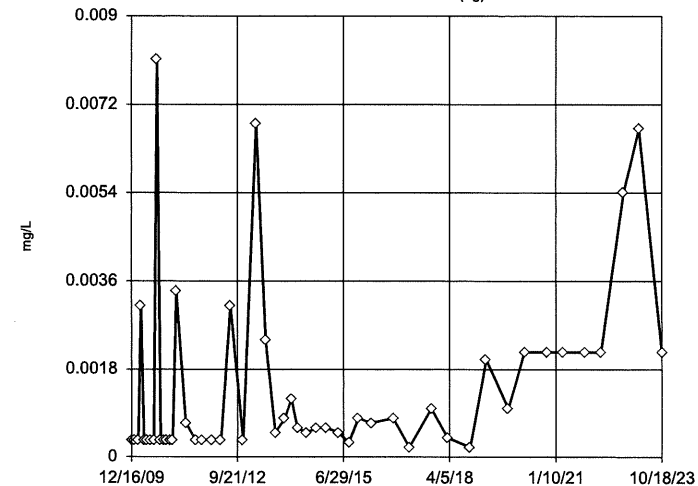


n = 49
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Thallium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

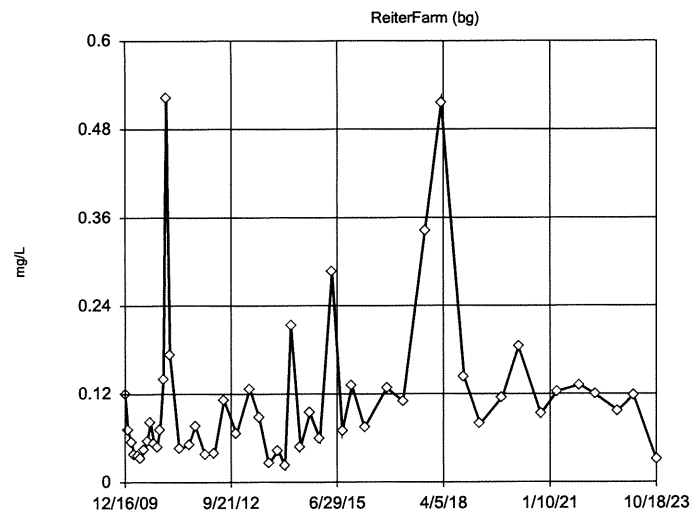
ReiterFarm (bg)



n = 50
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Vanadium Analysis Run 12/21/2023 4:19 PM View: 2023AWQR - Outliers
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR master

EPA Screening (suspected outliers for Rosner's Test)



Attachment C

Mann-Kendall/Sen's Slope Trend Test Summary Table and Graphs

Irenda Test

BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR Printed 2/12/2024, 4:15 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Aluminum (mg/L)	Well#1	0	-8	-21	No	8	62.5	0.01	NP
Aluminum (mg/L)	Well#2	0	-2	-21	No	8	50	0.01	NP
Aluminum (mg/L)	Well#3	0	2	21	No	8	50	0.01	NP
Aluminum (mg/L)	Well#4	0.0123	1	21	No	8	25	0.01	NP
Arsenic (mg/L)	Well#1	-0.0004343	-8	-21	No	8	0	0.01	NP
Arsenic (mg/L)	Well#2	0.0001209	11	21	No	8	37.5	0.01	NP
Arsenic (mg/L)	Well#3	0	0	21	No	8	25	0.01	NP
Arsenic (mg/L)	Well#4	0.0001255	2	21	No	8	25	0.01	NP
Barium (mg/L)	Well#1	-0.08994	-10	-21	No	8	0	0.01	NP
Barium (mg/L)	Well#2	0.006601	10	21	No	8	0	0.01	NP
Barium (mg/L)	Well#3	0.008994	3	21	No	8	0	0.01	NP
Barium (mg/L)	Well#4	0.01633	12	21	No	8	0	0.01	NP
Boron (mg/L)	Well#4	0	-7	-21	No	8	87.5	0.01	NP
Chloride (mg/L)	Well#1	0.2255	15	21	No	8	0	0.01	NP
Chloride (mg/L)	Well#2	-0.1001	-9	-21	No	8	0	0.01	NP
Chloride (mg/L)	Well#3	-0.5246	-6	-21	No	8	0	0.01	NP
Chloride (mg/L)	Well#4	2.629	10	21	No	8	0	0.01	NP
Chloroform (ug/L)	Well#3	0	-3	-21	No	8	87.5	0.01	NP
Chromium (mg/L)	Well#2	0	0	21	No	8	62.5	0.01	NP
Chromium (mg/L)	Well#3	0	1	21	No	8	50	0.01	NP
Chromium (mg/L)	Well#4	0.0007355	8	21	No	8	25	0.01	NP
Copper (mg/L)	Well#1	0.0001331	6	21	No	8	0	0.01	NP
Copper (mg/L)	Well#2	0.0004815	8	21	No	8	0	0.01	NP
Copper (mg/L)	Well#3	0.0005092	6	21	No	8	0	0.01	NP
Copper (mg/L)	Well#4	0.0004684	4	21	No	8	0	0.01	NP
Fluoride (mg/L)	Well#1	0	6	21	No	8	0	0.01	NP
Fluoride (mg/L)	Well#2	0	7	21	No	8	0	0.01	NP
Fluoride (mg/L)	Well#3	0	-2	-21	No	8	0	0.01	NP
Fluoride (mg/L)	Well#4	0.01664	5	21	No	8	0	0.01	NP
Iron (mg/L)	Well#1	-0.318	-22	-21	Yes	8	0	0.01	NP
Iron (mg/L)	Well#2	-0.3495	-14	-21	No	8	0	0.01	NP
Iron (mg/L)	Well#3	-0.2111	-12	-21	No	8	12.5	0.01	NP
Iron (mg/L)	Well#4	0.09133	4	21	No	8	12.5	0.01	NP
Lead (mg/L)	Well#1	0	2	21	No	8	62.5	0.01	NP
Lead (mg/L)	Well#2	0	-5	-21	No	8	62.5	0.01	NP
Lead (mg/L)	Well#3	0	3	21	No	8	75	0.01	NP
Lead (mg/L)	Well#4	0.0002664	13	21	No	8	37.5	0.01	NP
Magnesium (mg/L)	Well#1	-0.1947	-9	-21	No	8	0	0.01	NP
Magnesium (mg/L)	Well#2	1.16	16	21	No	8	0	0.01	NP
Magnesium (mg/L)	Well#3	-0.2412	-2	-21	No	8	0	0.01	NP
Magnesium (mg/L)	Well#4	-0.5349	-4	-21	No	8	0	0.01	NP
Manganese (mg/L)	Well#1	-0.003445	-14	-21	No	8	0	0.01	NP
Manganese (mg/L)	Well#2	-0.002923	-10	-21	No	8	0	0.01	NP
Manganese (mg/L)	Well#3	-0.004325	-10	-21	No	8	0	0.01	NP
Manganese (mg/L)	Well#4	0.0139	10	21	No	8	0	0.01	NP
Molybdenum (mg/L)	Well#3	-0.0008268	-9	-21	No	8	0	0.01	NP
Molybdenum (mg/L)	Well#4	0.0006839	4	21	No	8	0	0.01	NP
Nickel (mg/L)	Well#1	0.00002788	2	21	No	8	25	0.01	NP
Nickel (mg/L)	Well#3	-0.003277	-18	-21	No	8	0	0.01	NP
Nickel (mg/L)	Well#4	0.001522	12	21	No	8	0	0.01	NP

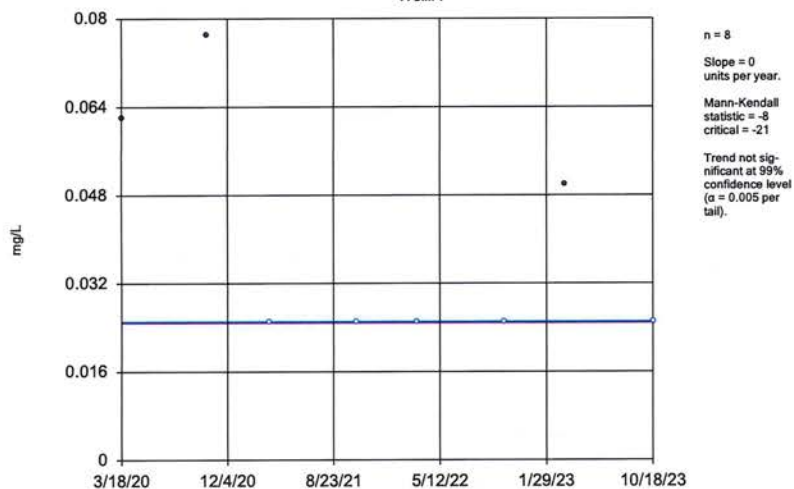
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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR Printed 2/12/2024, 4:15 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Alpha</u>	<u>Method</u>
Selenium (mg/L)	Well#3	0	2	21	No	8	50	0.01	NP
Selenium (mg/L)	Well#4	0	0	21	No	8	25	0.01	NP
Silver (mg/L)	Well#2	0.0002581	6	21	No	8	75	0.01	NP
Sulfate (mg/L)	Well#1	11.77	26	21	Yes	8	0	0.01	NP
Sulfate (mg/L)	Well#2	-5.724	-21	-21	No	8	0	0.01	NP
Sulfate (mg/L)	Well#3	5.394	9	21	No	8	0	0.01	NP
Sulfate (mg/L)	Well#4	7.573	10	21	No	8	0	0.01	NP
Thallium (mg/L)	Well#1	0	5	21	No	8	87.5	0.01	NP
Thallium (mg/L)	Well#2	0	7	21	No	8	75	0.01	NP
Thallium (mg/L)	Well#3	0	3	21	No	8	87.5	0.01	NP
Vanadium (mg/L)	Well#3	0	9	21	No	8	75	0.01	NP
Vanadium (mg/L)	Well#4	0.001551	8	21	No	8	50	0.01	NP
Zinc (mg/L)	Well#2	0	1	21	No	8	87.5	0.01	NP
Zinc (mg/L)	Well#3	0	-1	-21	No	8	87.5	0.01	NP

Sen's Slope Estimator

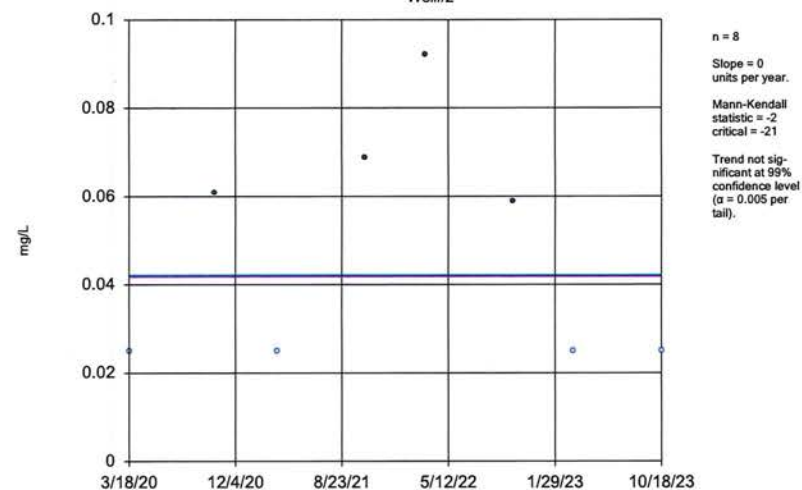
Well#1



Constituent: Aluminum Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

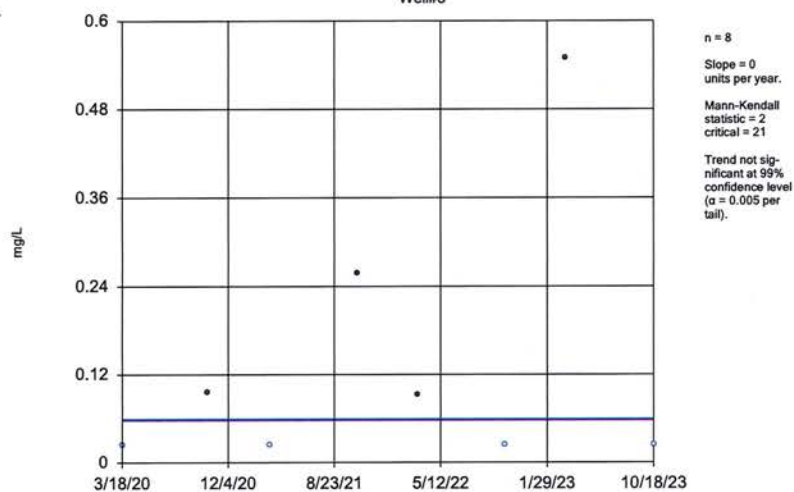
Well#2



Constituent: Aluminum Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

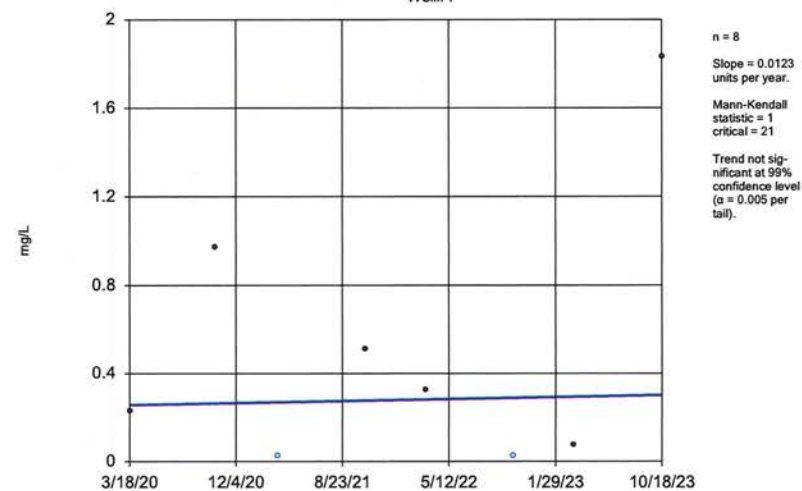
Well#3



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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

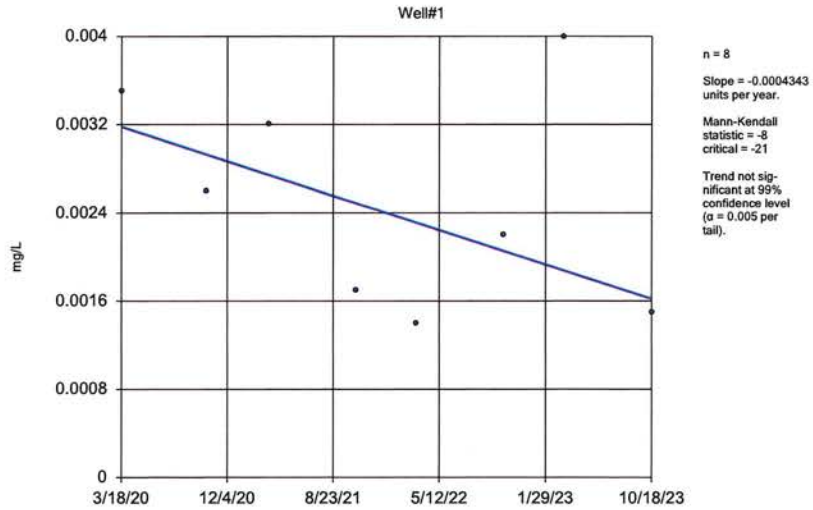
Sen's Slope Estimator

Well#4



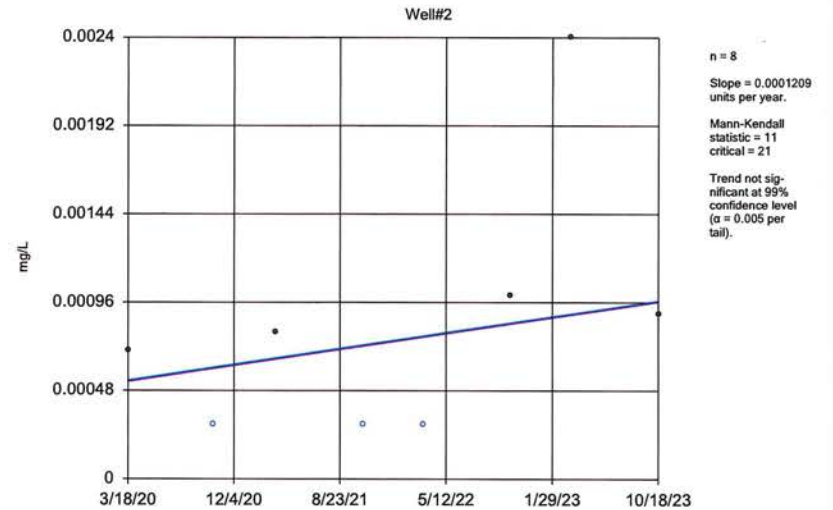
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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator



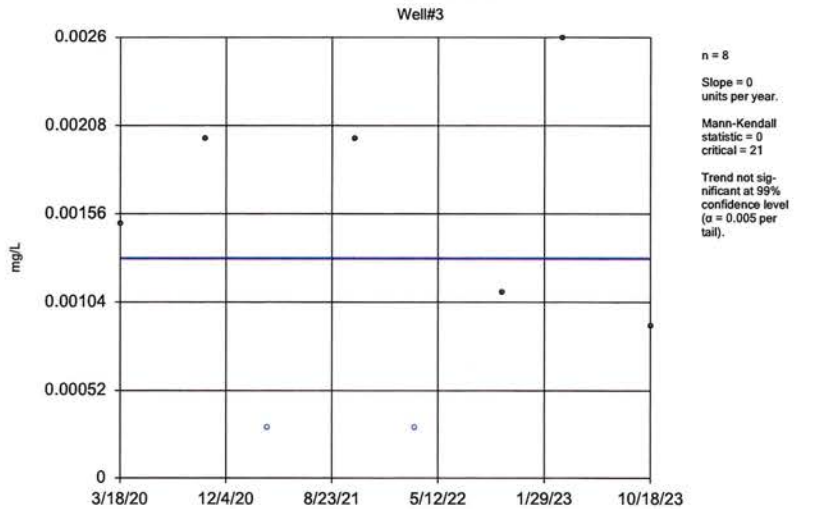
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 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator



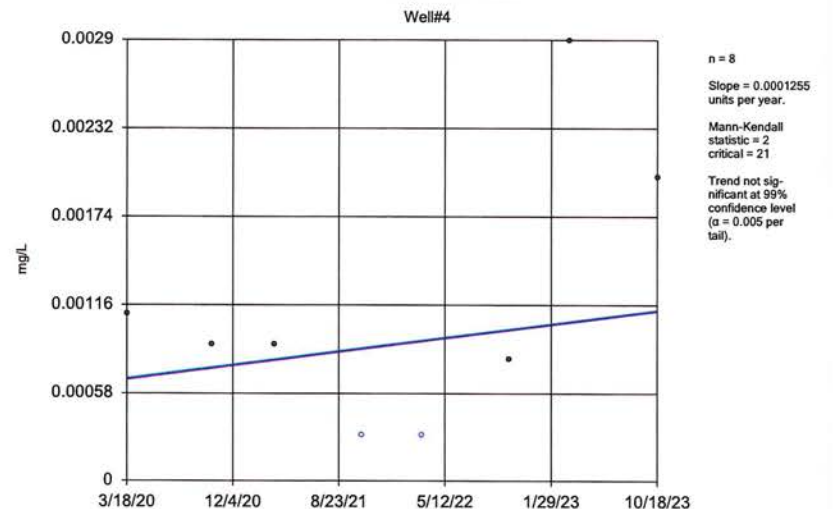
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 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator



Constituent: Arsenic Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

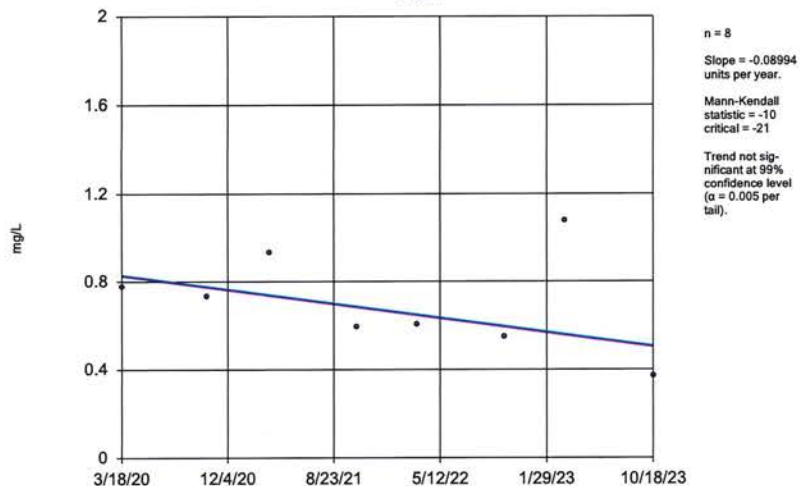
Sen's Slope Estimator



Constituent: Arsenic Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

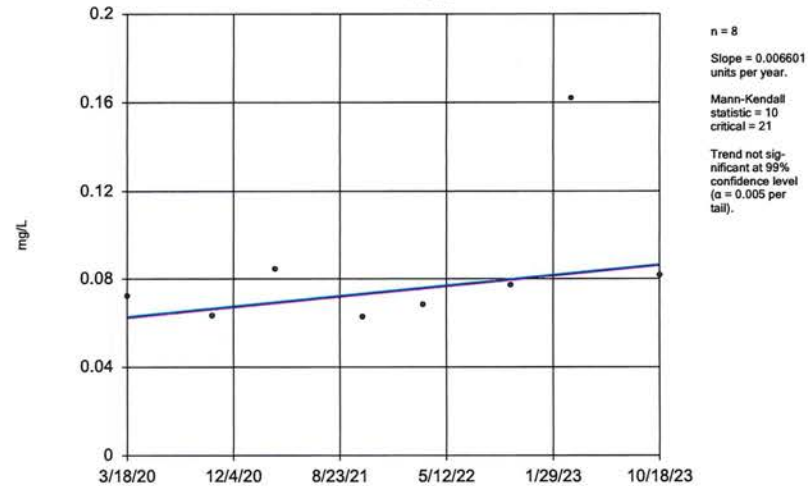
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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

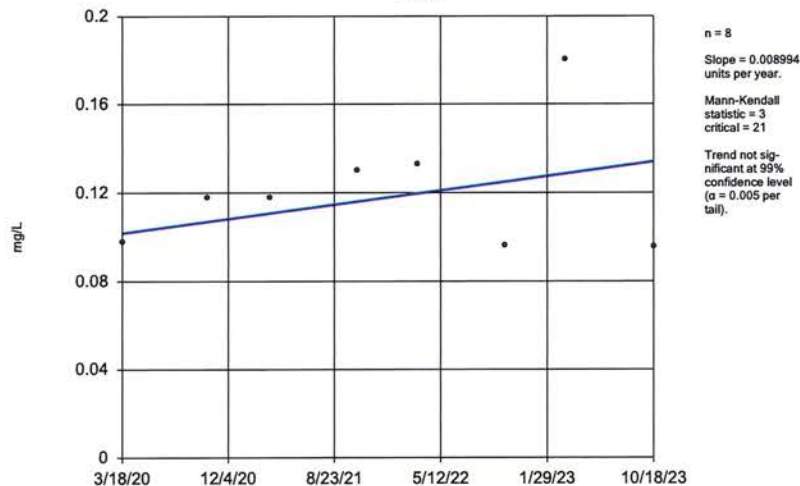
Well#2



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BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

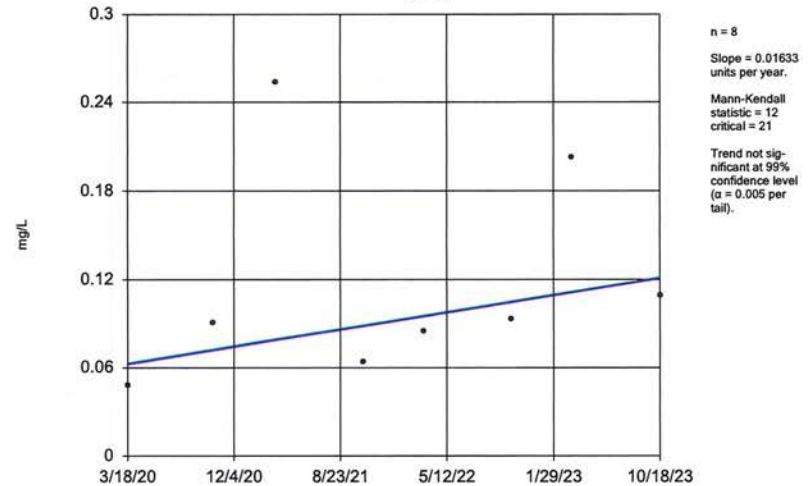
Well#3



Constituent: Barium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

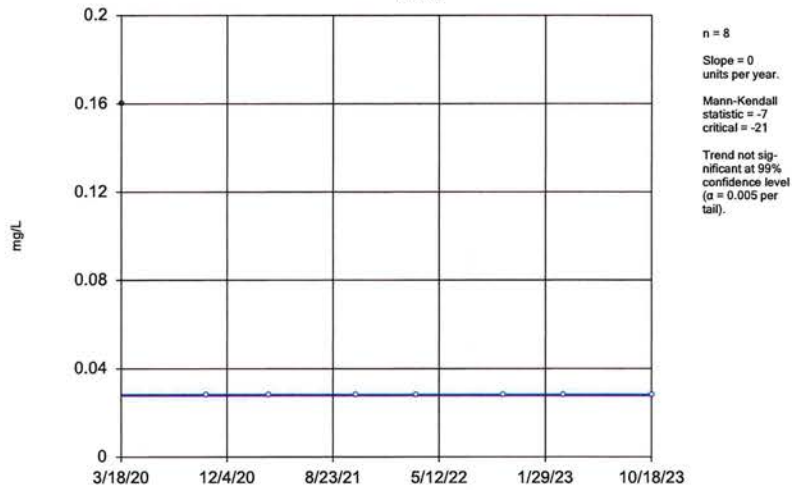
Well#4



Constituent: Barium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

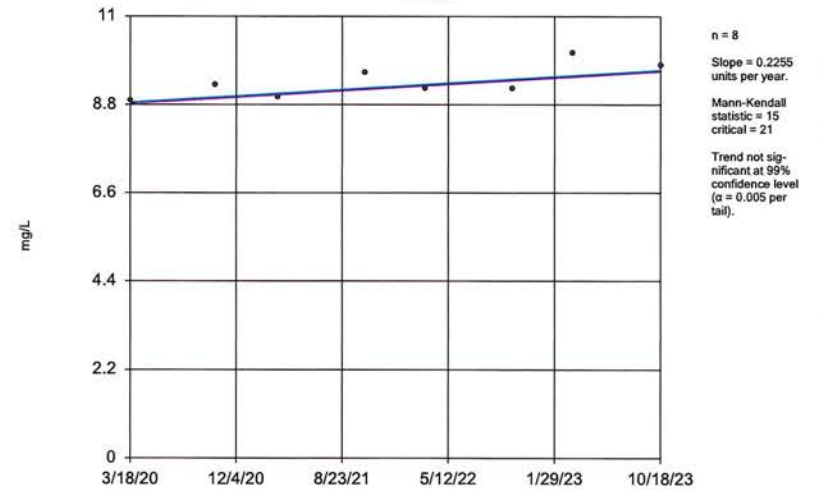
Well#4



Constituent: Boron Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

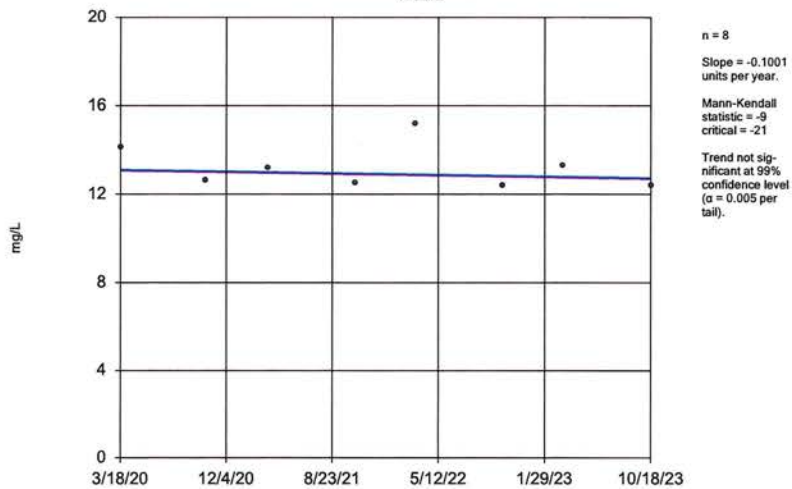
Well#1



Constituent: Chloride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

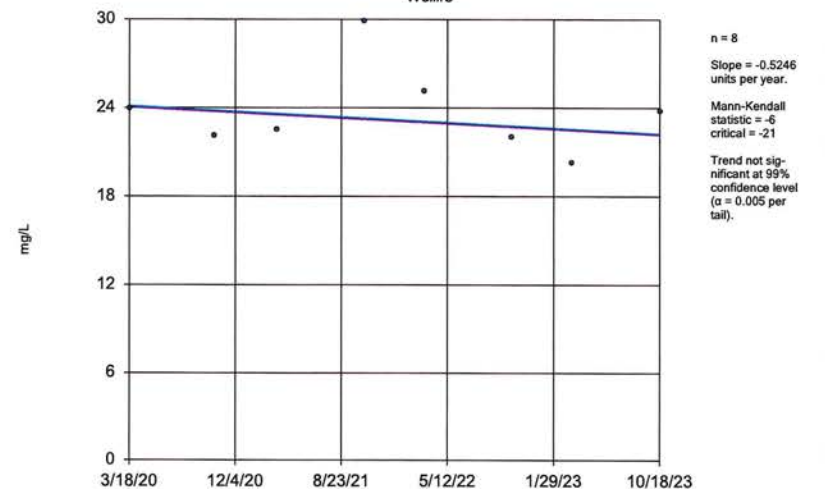
Well#2



Constituent: Chloride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

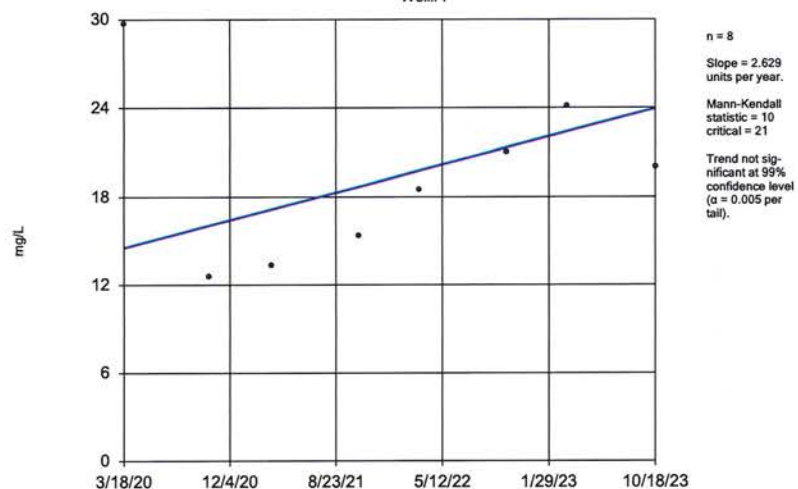
Well#3



Constituent: Chloride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

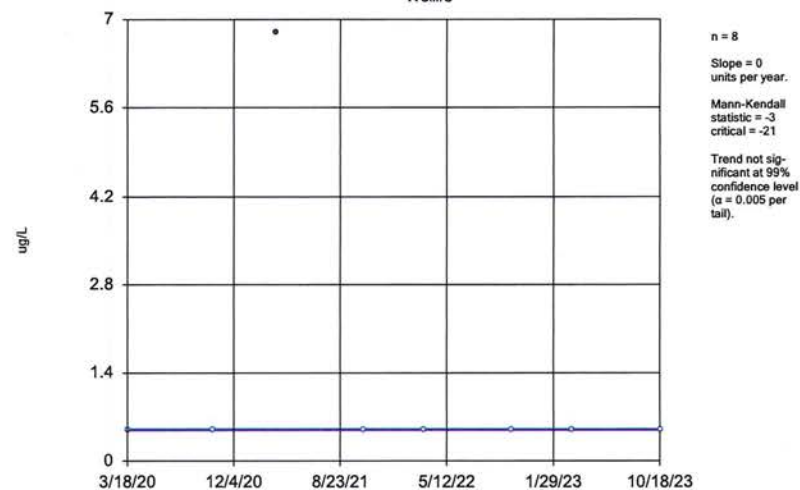
Well#4



Constituent: Chloride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

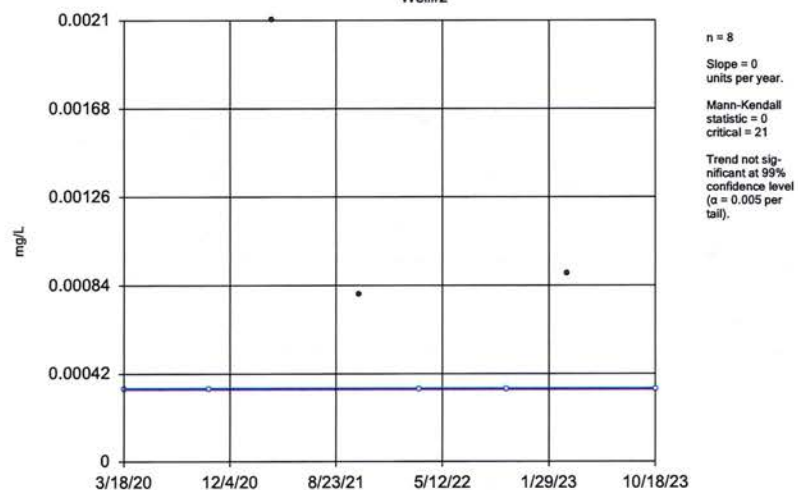
Well#3



Constituent: Chloroform Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

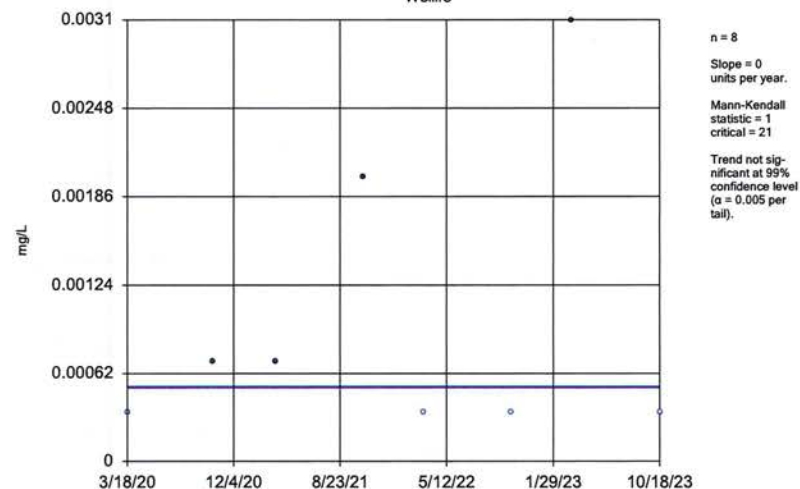
Well#2



Constituent: Chromium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

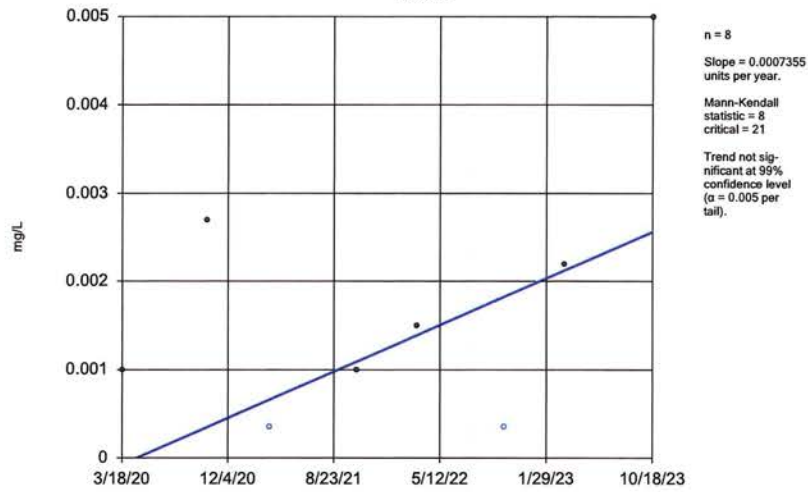
Well#3



Constituent: Chromium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

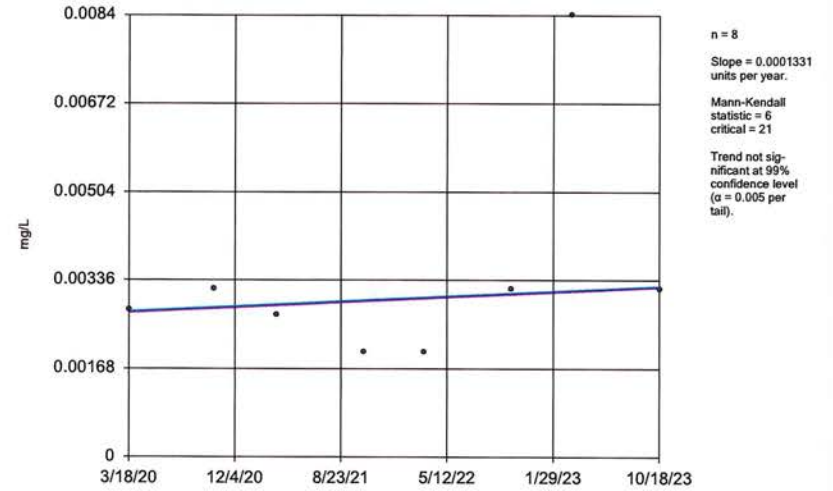
Well#4



Constituent: Chromium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

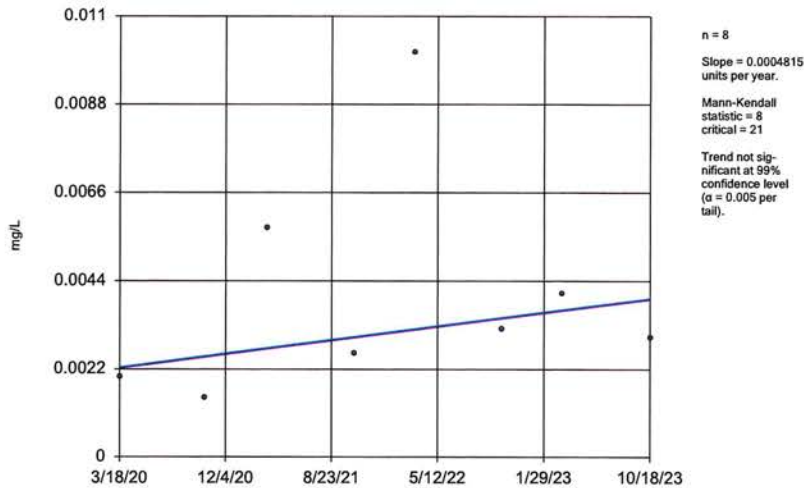
Well#1



Constituent: Copper Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

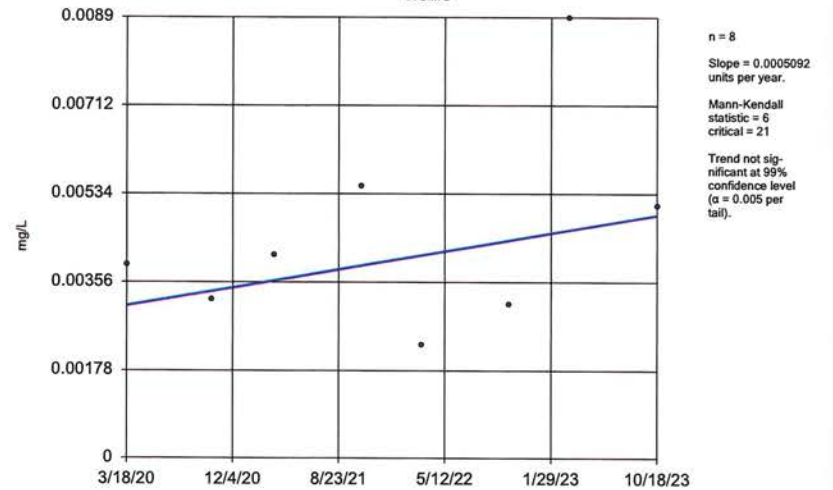
Well#2



Constituent: Copper Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

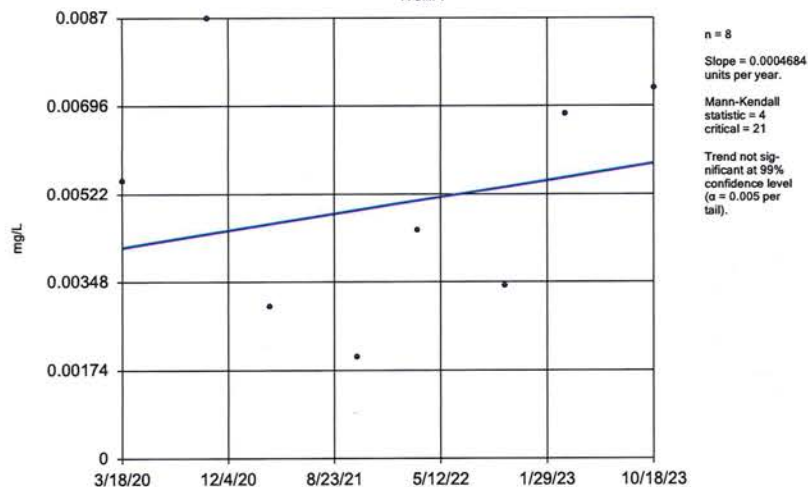
Well#3



Constituent: Copper Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

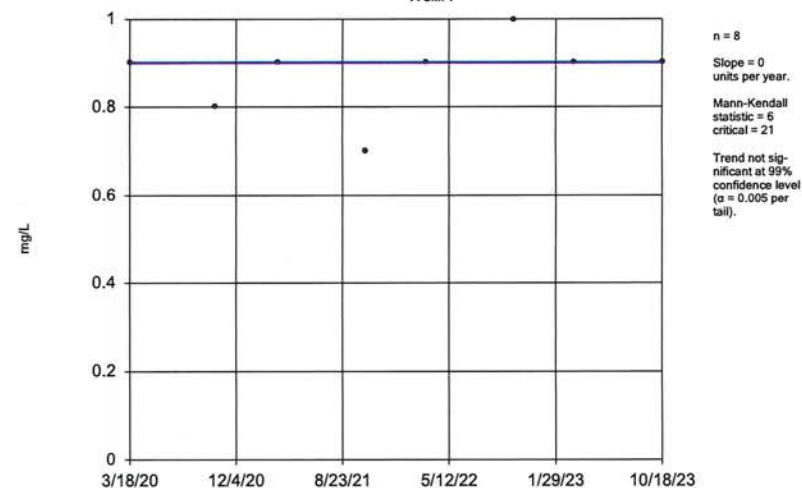
Well#4



Constituent: Copper Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

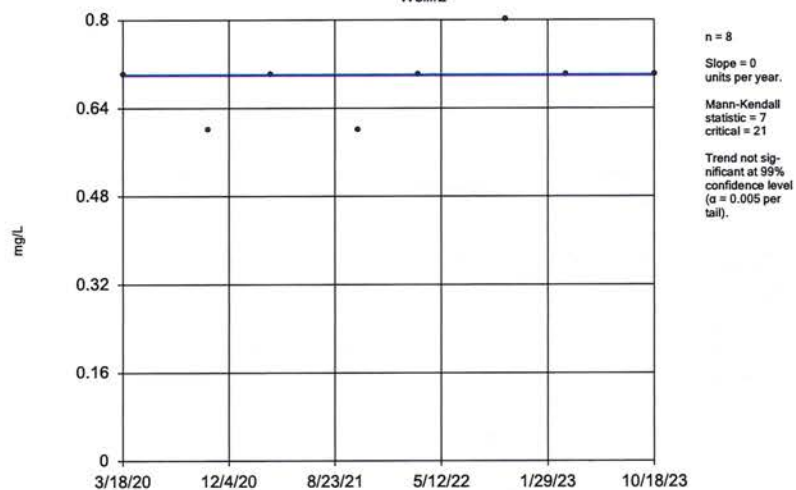
Well#1



Constituent: Fluoride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

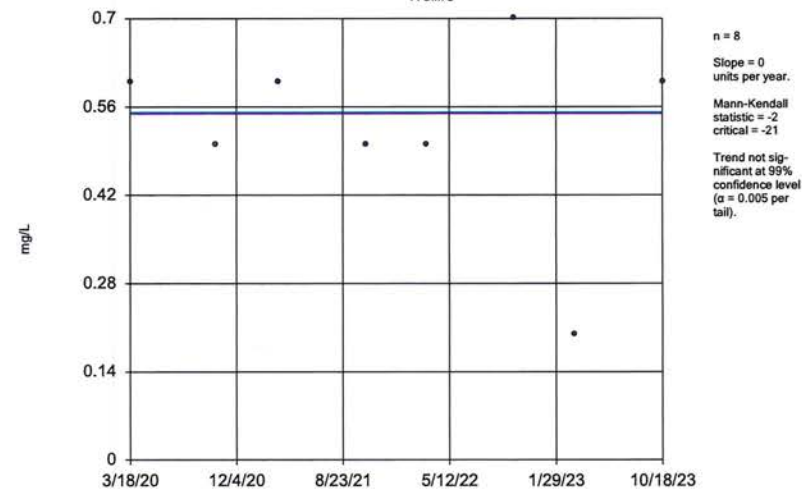
Well#2



Constituent: Fluoride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

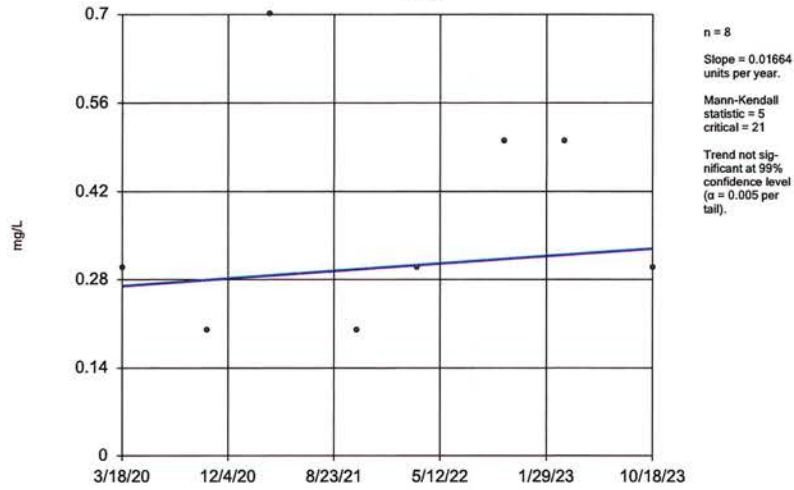
Well#3



Constituent: Fluoride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

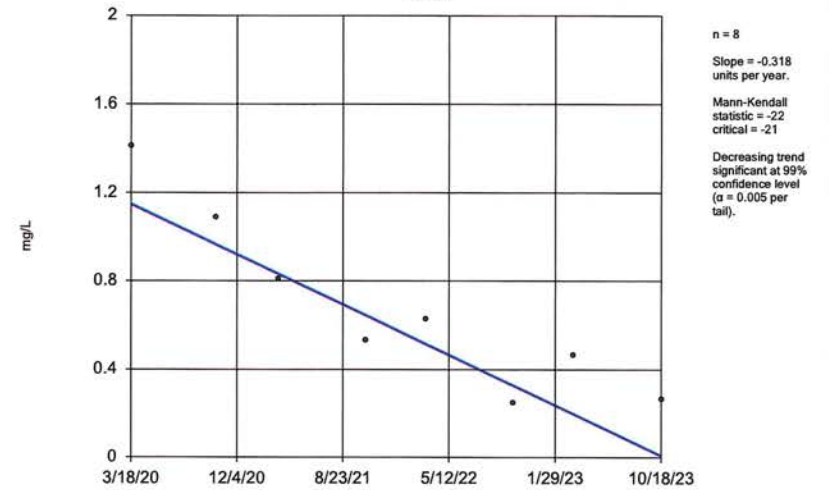
Well#4



Constituent: Fluoride Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

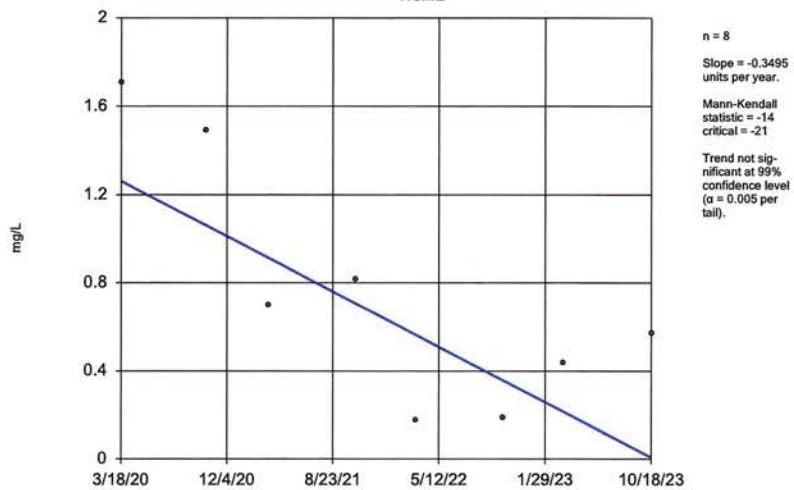
Well#1



Constituent: Iron Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

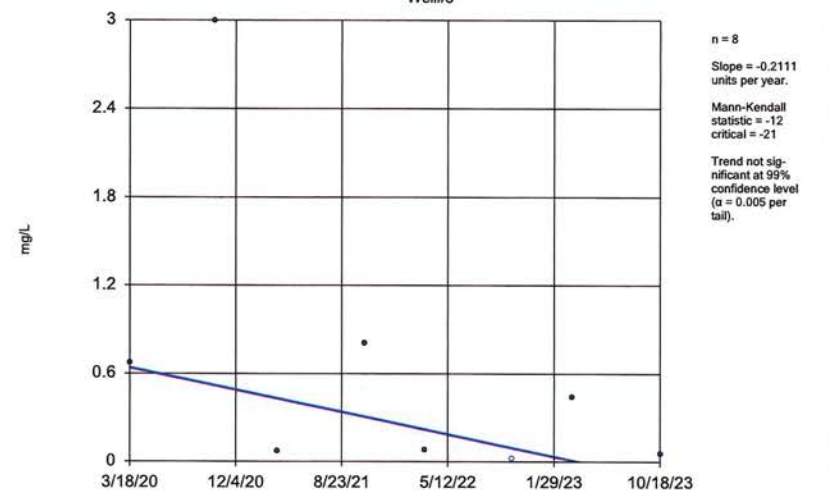
Well#2



Constituent: Iron Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

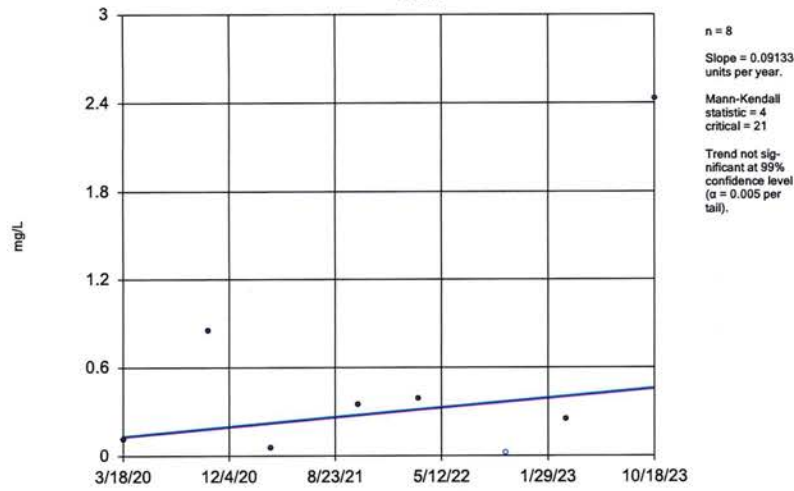
Well#3



Constituent: Iron Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

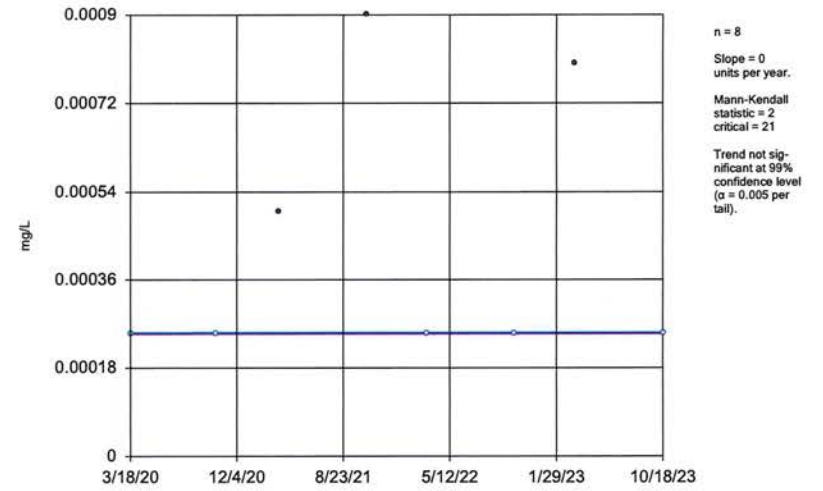
Well#4



Constituent: Iron Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

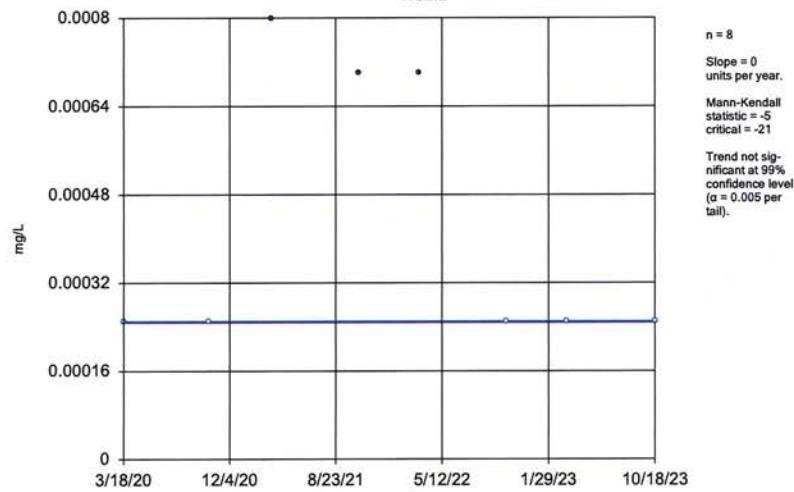
Well#1



Constituent: Lead Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

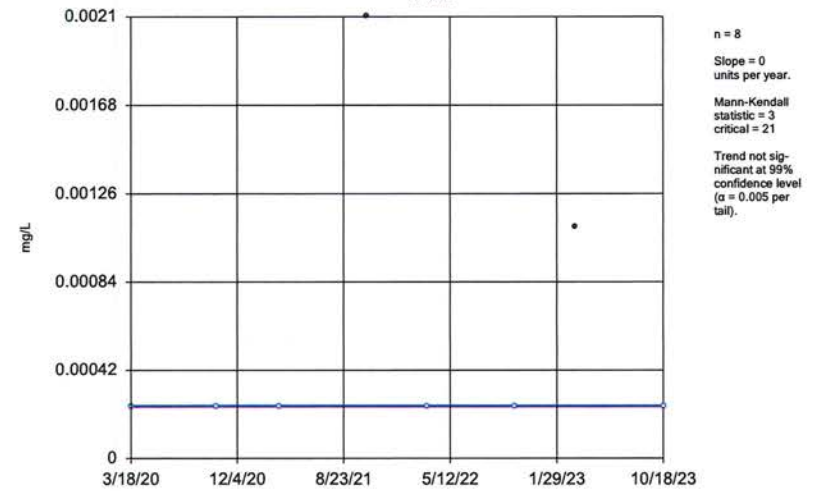
Well#2



Constituent: Lead Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

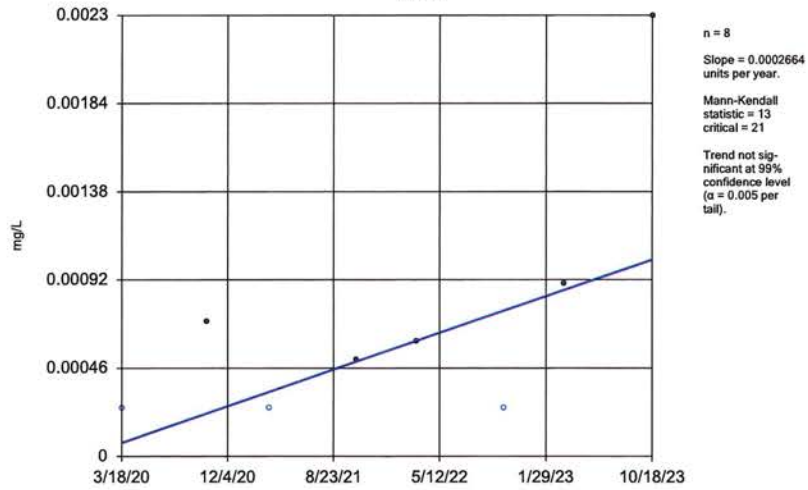
Well#3



Constituent: Lead Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

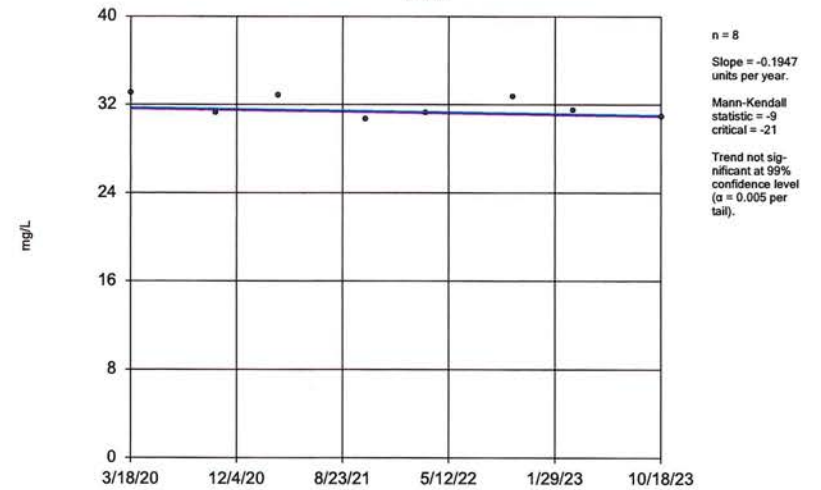
Well#4



Constituent: Lead Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

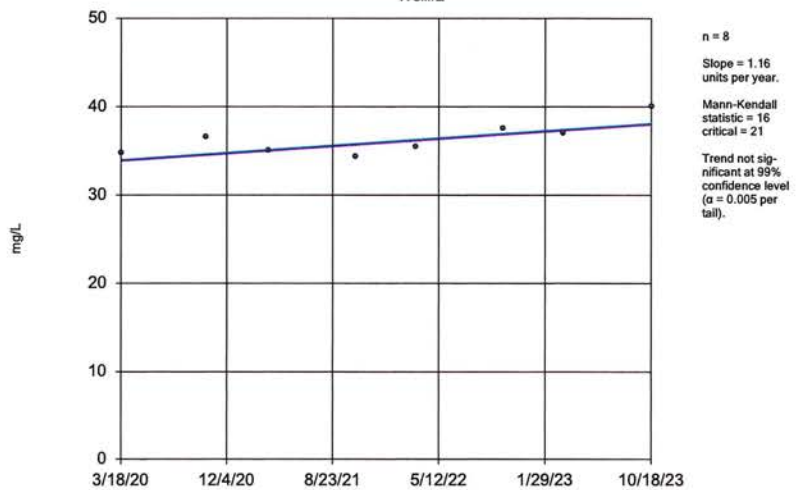
Well#1



Constituent: Magnesium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

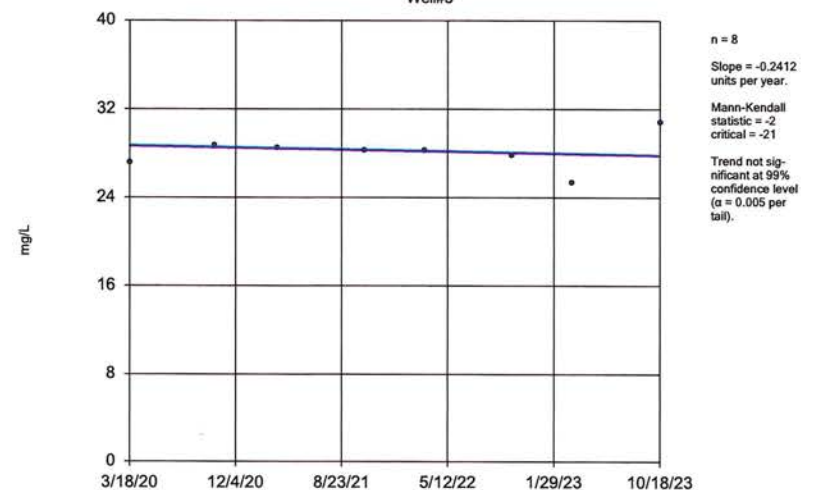
Well#2



Constituent: Magnesium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

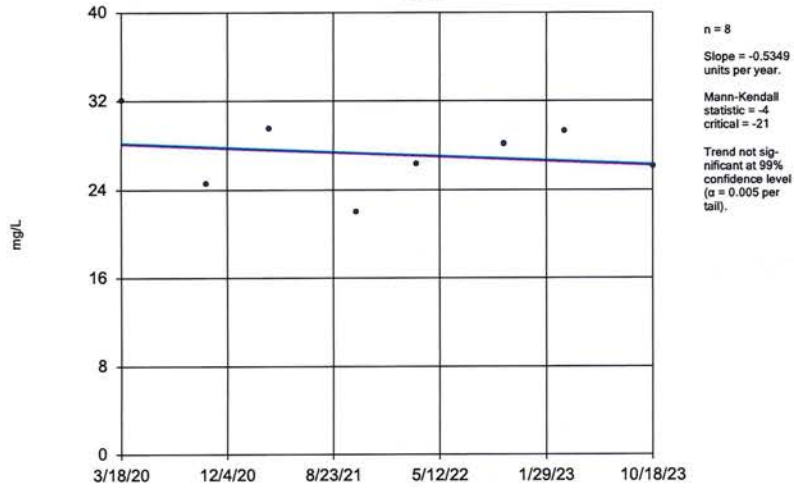
Well#3



Constituent: Magnesium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

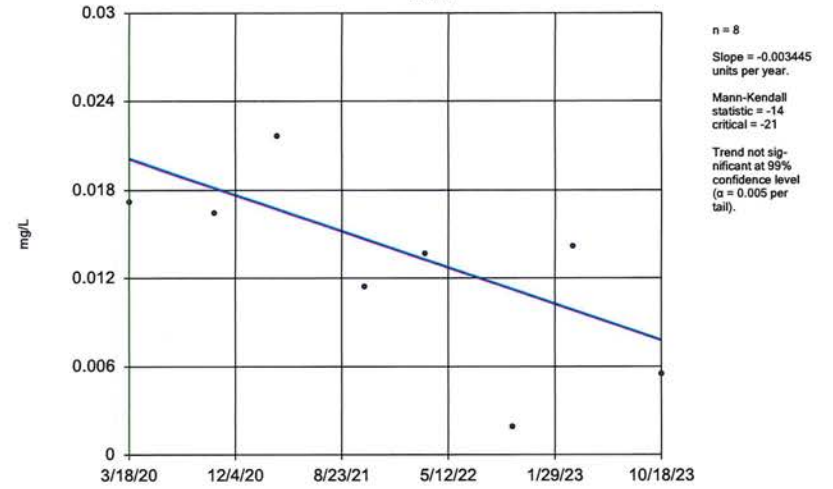
Well#4



Constituent: Magnesium Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

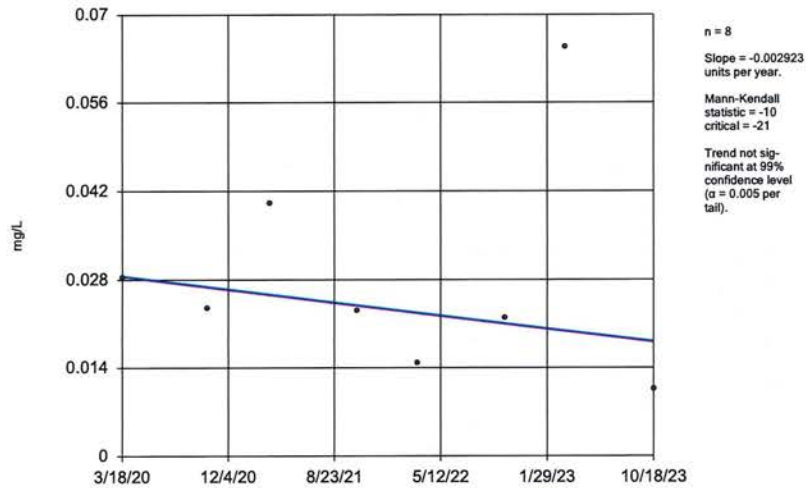
Well#1



Constituent: Manganese Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

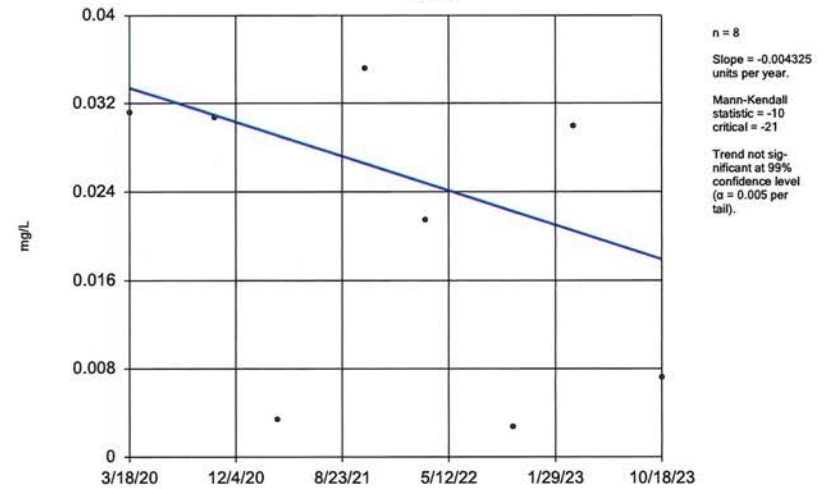
Well#2



Constituent: Manganese Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

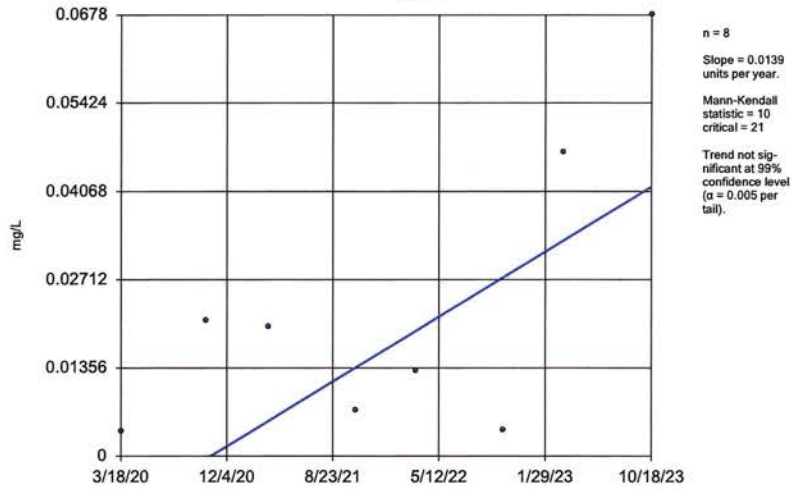
Well#3



Constituent: Manganese Analysis Run 2/12/2024 4:13 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

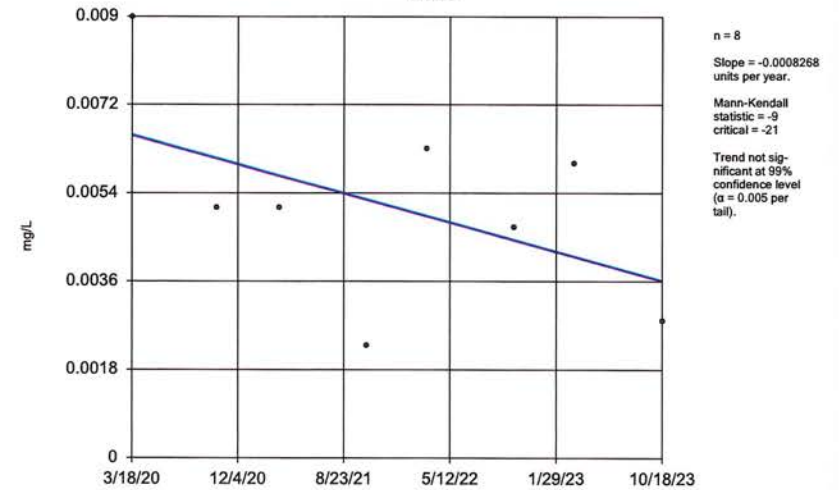
Well#4



Constituent: Manganese Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

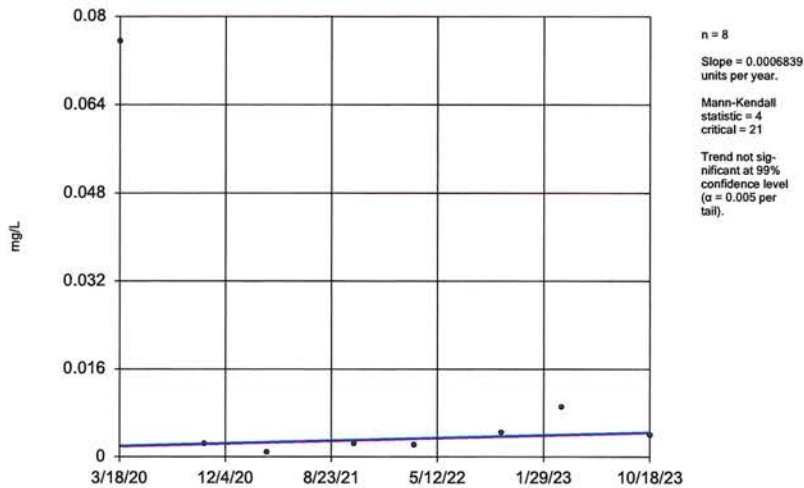
Well#3



Constituent: Molybdenum Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#4

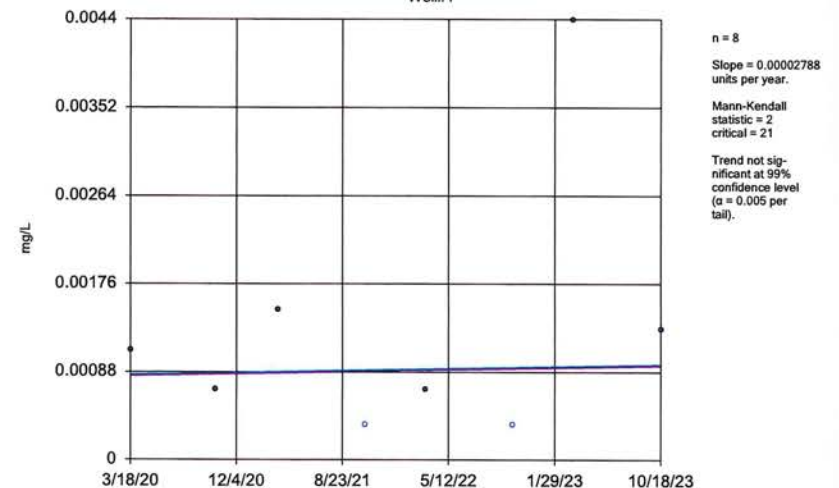


Constituent: Molybdenum Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Hollow symbols indicate censored values.

Sen's Slope Estimator

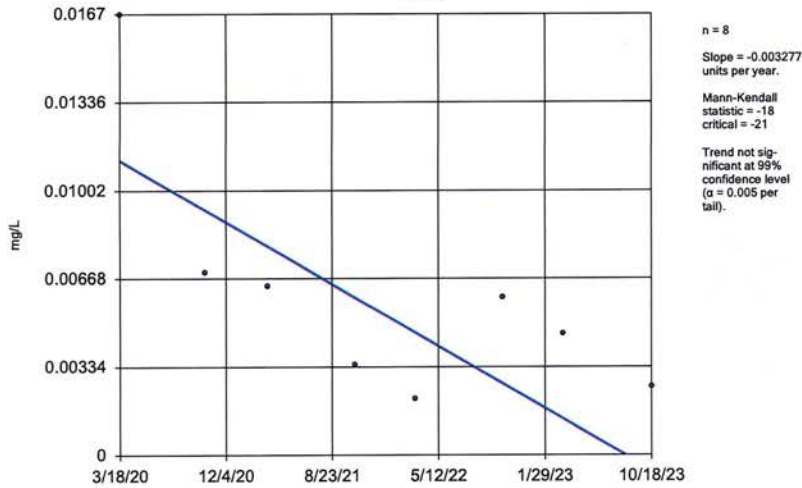
Well#1



Constituent: Nickel Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

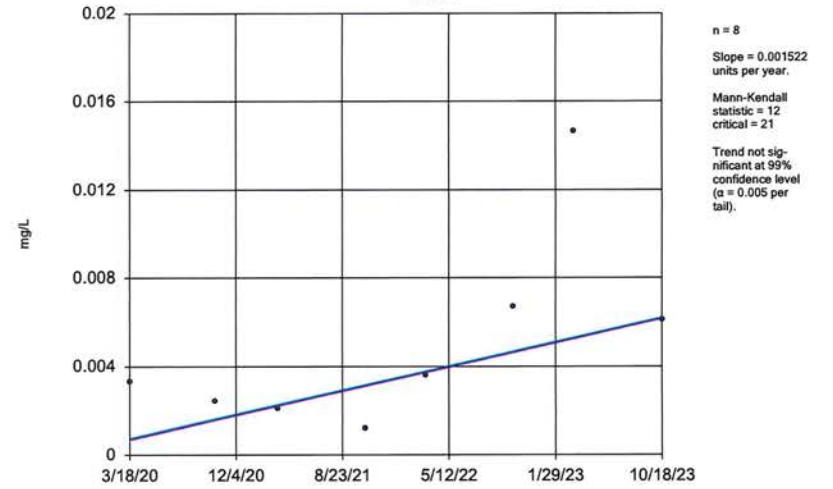
Well#3



Constituent: Nickel Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

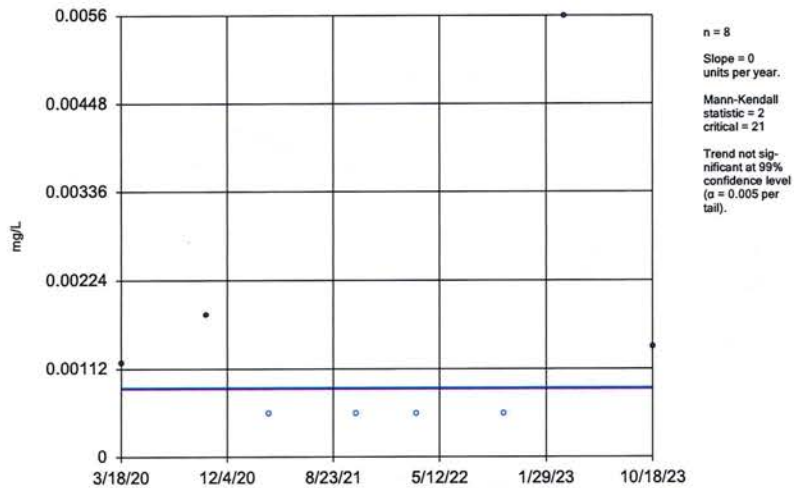
Well#4



Constituent: Nickel Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

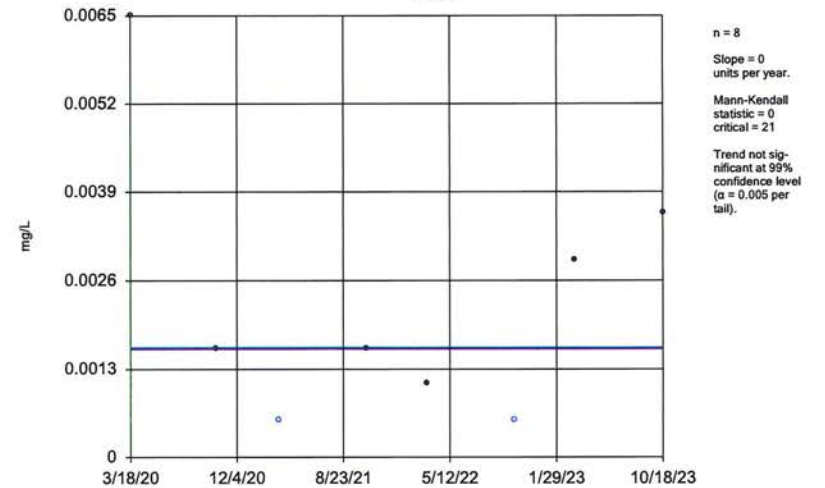
Well#3



Constituent: Selenium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

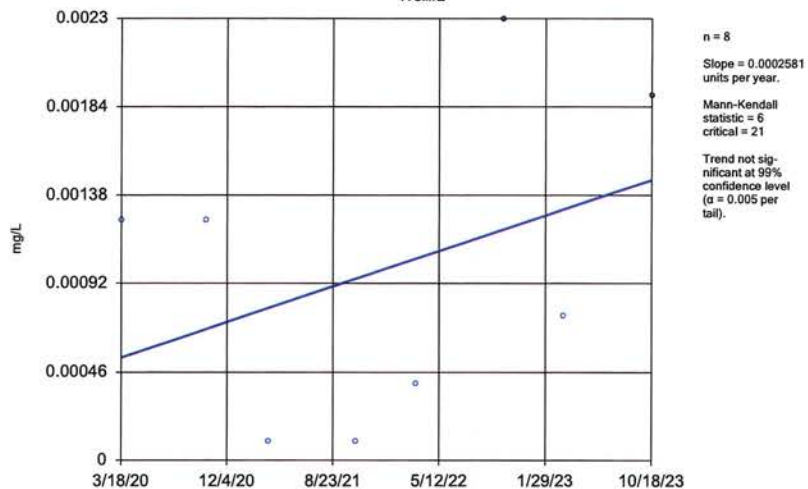
Well#4



Constituent: Selenium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

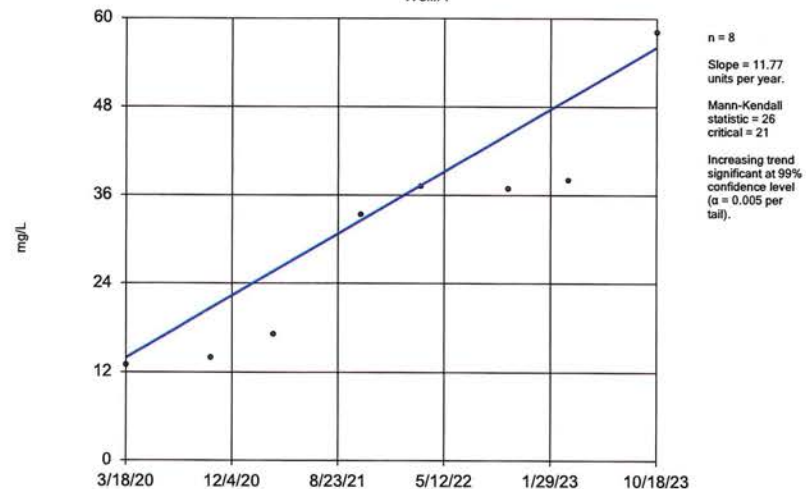
Well#2



Constituent: Silver Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

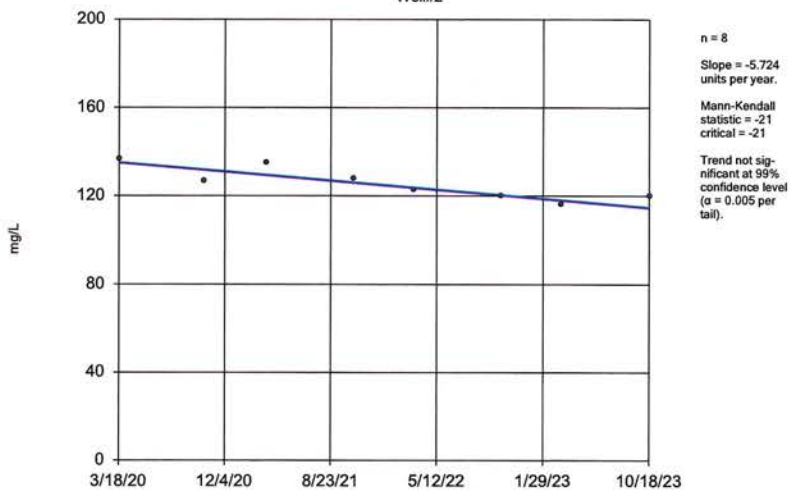
Well#1



Constituent: Sulfate Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

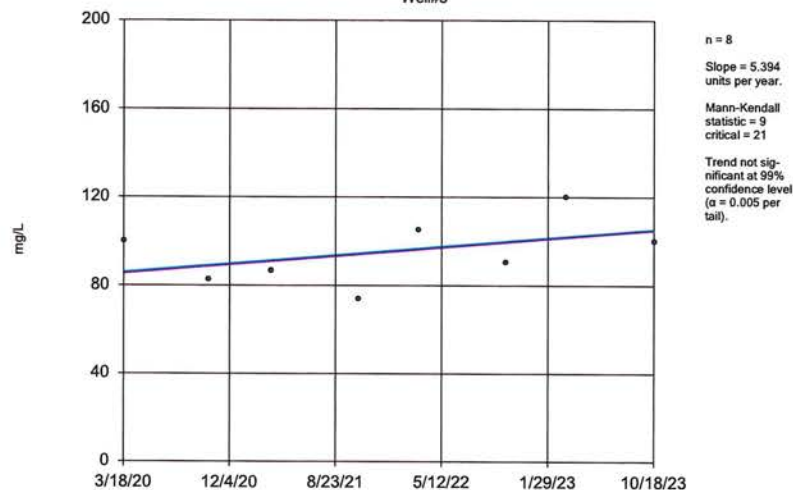
Well#2



Constituent: Sulfate Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

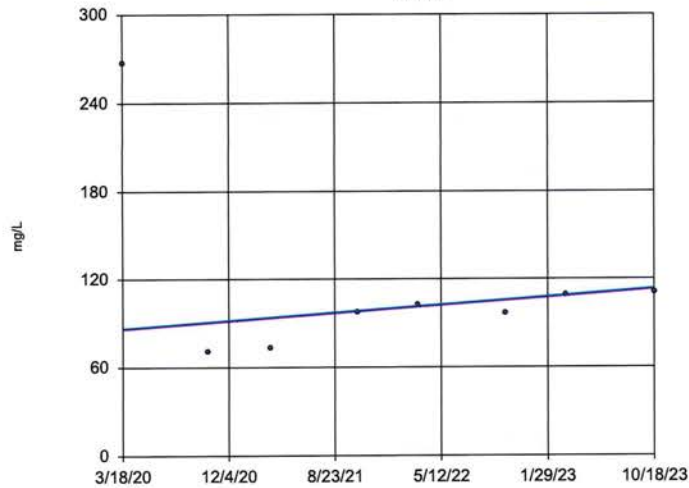
Well#3



Constituent: Sulfate Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#4

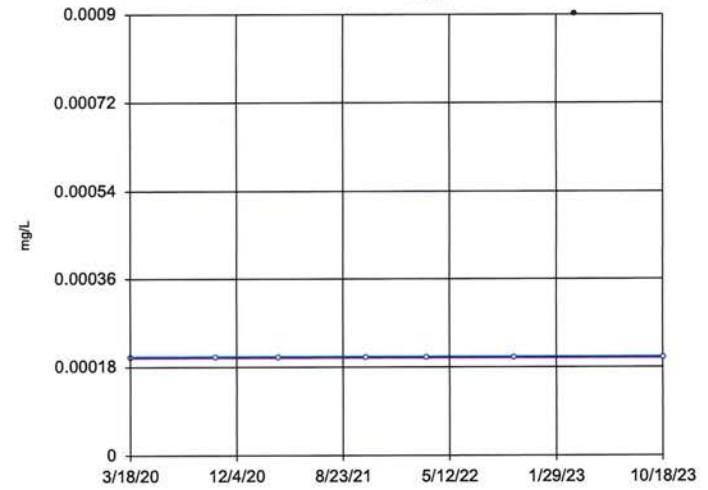


n = 8
 Slope = 7.573
 units per year.
 Mann-Kendall
 statistic = 10
 critical = 21
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Sulfate Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#1

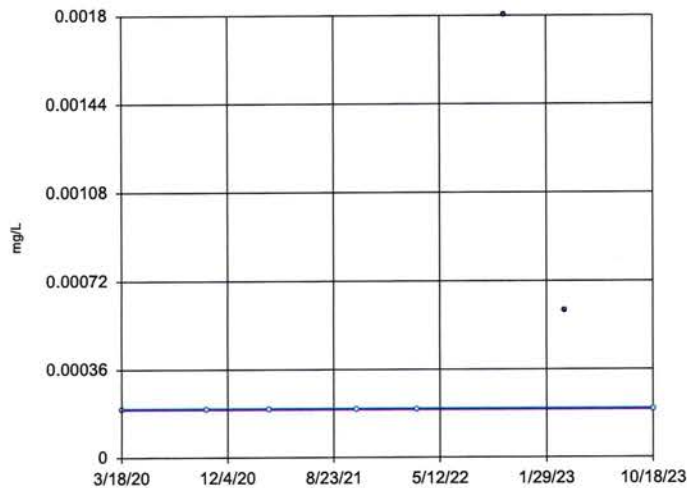


n = 8
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 5
 critical = 21
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Thallium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#2

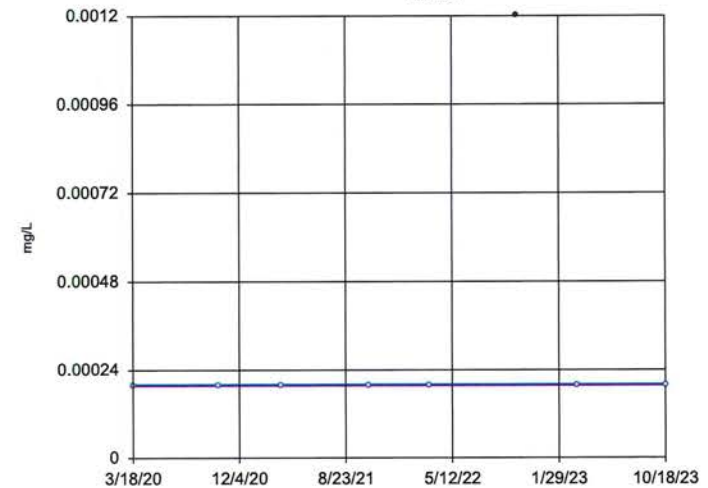


n = 8
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 7
 critical = 21
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Thallium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#3

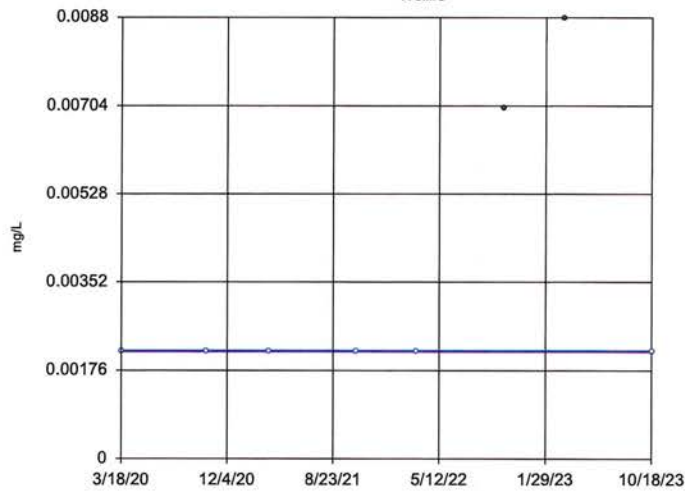


n = 8
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 3
 critical = 21
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Thallium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#3

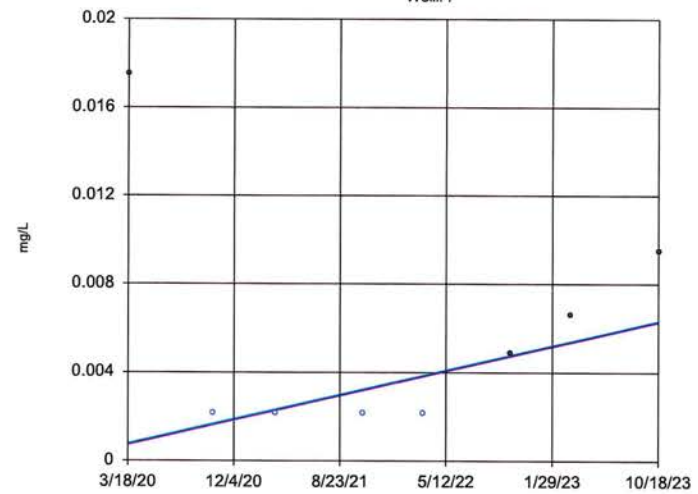


n = 8
Slope = 0
units per year.
Mann-Kendall
statistic = 9
critical = 21
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Vanadium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#4

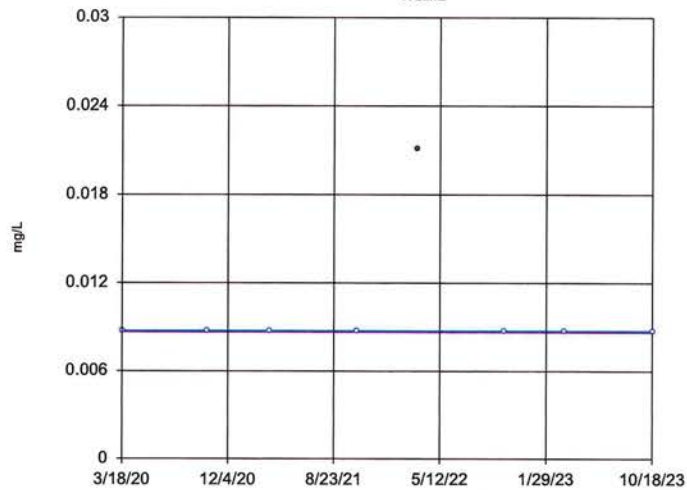


n = 8
Slope = 0.001551
units per year.
Mann-Kendall
statistic = 8
critical = 21
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Vanadium Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#2

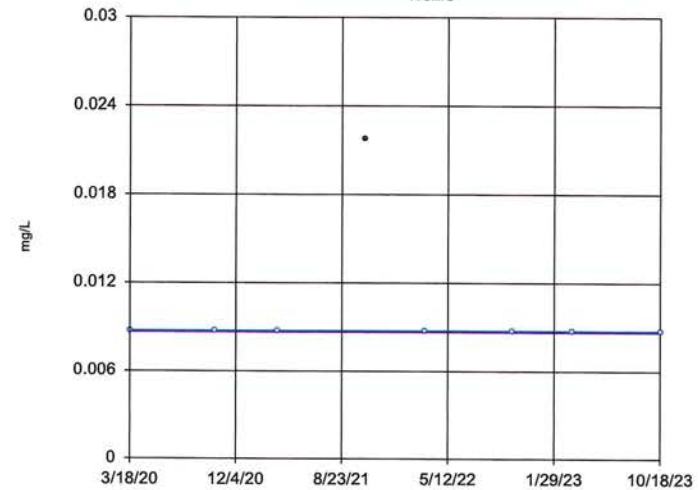


n = 8
Slope = 0
units per year.
Mann-Kendall
statistic = 1
critical = 21
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Zinc Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope Estimator

Well#3



n = 8
Slope = 0
units per year.
Mann-Kendall
statistic = -1
critical = -21
Trend not sig-
nificant at 99%
confidence level
($\alpha = 0.005$ per
tail).

Constituent: Zinc Analysis Run 2/12/2024 4:14 PM View: 2023AWQR - Mann Kendall
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Attachment D
Confidence Interval Summary Table and Graphs

Confidence Interval

BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR Printed 2/12/2024, 4:17 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Aluminum (mg/L)	Well#1	0.077	0.025	0.2	No	8	62.5	No	0.004	NP (NDs)
Aluminum (mg/L)	Well#2	0.07467	0.04558	0.2	No	8	50	No	0.01	Param.
Aluminum (mg/L)	Well#3	0.549	0.025	0.2	No	8	50	No	0.004	NP (normality)
Aluminum (mg/L)	Well#4	1.119	0	0.2	No	8	25	No	0.01	Param.
Arsenic (mg/L)	Well#1	0.003549	0.001476	0.01	No	8	0	No	0.01	Param.
Arsenic (mg/L)	Well#2	0.00155	0.0003504	0.01	No	8	37.5	No	0.01	Param.
Arsenic (mg/L)	Well#3	0.001995	0.000565	0.01	No	8	25	No	0.01	Param.
Arsenic (mg/L)	Well#4	0.002017	0.0003745	0.01	No	8	25	No	0.01	Param.
Barium (mg/L)	Well#1	0.945	0.4655	2	No	8	0	No	0.01	Param.
Barium (mg/L)	Well#2	0.162	0.0629	2	No	8	0	No	0.004	NP (normality)
Barium (mg/L)	Well#3	0.1508	0.09133	2	No	8	0	No	0.01	Param.
Barium (mg/L)	Well#4	0.1944	0.04217	2	No	8	0	No	0.01	Param.
Boron (mg/L)	Well#4	0.16	0.028	6	No	8	87.5	No	0.004	NP (NDs)
Chloride (mg/L)	Well#1	9.824	8.951	250	No	8	0	No	0.01	Param.
Chloride (mg/L)	Well#2	14.27	12.16	250	No	8	0	No	0.01	Param.
Chloride (mg/L)	Well#3	26.77	20.63	250	No	8	0	No	0.01	Param.
Chloride (mg/L)	Well#4	25.42	13.21	250	No	8	0	No	0.01	Param.
Chloroform (ug/L)	Well#3	6.8	0.5	80	No	8	87.5	No	0.004	NP (NDs)
Chromium (mg/L)	Well#2	0.0021	0.00035	0.1	No	8	62.5	No	0.004	NP (NDs)
Chromium (mg/L)	Well#3	0.0031	0.00035	0.1	No	8	50	No	0.004	NP (normality)
Chromium (mg/L)	Well#4	0.003291	0.0003339	0.1	No	8	25	No	0.01	Param.
Copper (mg/L)	Well#1	0.0084	0.002	1.3	No	8	0	No	0.004	NP (normality)
Copper (mg/L)	Well#2	0.006968	0.001082	1.3	No	8	0	No	0.01	Param.
Copper (mg/L)	Well#3	0.006697	0.002328	1.3	No	8	0	No	0.01	Param.
Copper (mg/L)	Well#4	0.007623	0.002677	1.3	No	8	0	No	0.01	Param.
Fluoride (mg/L)	Well#1	0.969	0.781	2	No	8	0	No	0.01	Param.
Fluoride (mg/L)	Well#2	0.7554	0.6196	2	No	8	0	No	0.01	Param.
Fluoride (mg/L)	Well#3	0.6827	0.3673	2	No	8	0	No	0.01	Param.
Fluoride (mg/L)	Well#4	0.5608	0.1892	2	No	8	0	No	0.01	Param.
Iron (mg/L)	Well#2	1.362	0.1605	0.3	No	8	0	No	0.01	Param.
Iron (mg/L)	Well#3	3	0.0235	0.3	No	8	12.5	No	0.004	NP (normality)
Iron (mg/L)	Well#4	2.43	0.0235	0.3	No	8	12.5	No	0.004	NP (normality)
Lead (mg/L)	Well#1	0.0009	0.00025	0.015	No	8	62.5	No	0.004	NP (NDs)
Lead (mg/L)	Well#2	0.0008	0.00025	0.015	No	8	62.5	No	0.004	NP (NDs)
Lead (mg/L)	Well#3	0.0021	0.00025	0.015	No	8	75	No	0.004	NP (NDs)
Lead (mg/L)	Well#4	0.0023	0.00025	0.015	No	8	37.5	No	0.004	NP (normality)
Magnesium (mg/L)	Well#1	32.74	30.76	26.08	Yes	8	0	No	0.01	Param.
Magnesium (mg/L)	Well#2	38.36	34.31	26.08	Yes	8	0	No	0.01	Param.
Magnesium (mg/L)	Well#3	29.73	26.45	26.08	Yes	8	0	No	0.01	Param.
Magnesium (mg/L)	Well#4	30.56	23.92	26.08	No	8	0	No	0.01	Param.
Manganese (mg/L)	Well#1	0.01952	0.005956	0.05	No	8	0	No	0.01	Param.
Manganese (mg/L)	Well#2	0.04656	0.01029	0.05	No	8	0	No	0.01	Param.
Manganese (mg/L)	Well#3	0.03468	0.005716	0.05	No	8	0	No	0.01	Param.
Manganese (mg/L)	Well#4	0.0472	0	0.05	No	8	0	No	0.01	Param.
Molybdenum (mg/L)	Well#3	0.007383	0.002942	0.04	No	8	0	No	0.01	Param.
Molybdenum (mg/L)	Well#4	0.0755	0.0008	0.04	No	8	0	No	0.004	NP (normality)
Nickel (mg/L)	Well#1	0.0044	0.00035	0.1	No	8	25	No	0.004	NP (normality)
Nickel (mg/L)	Well#3	0.01101	0.001166	0.1	No	8	0	No	0.01	Param.
Nickel (mg/L)	Well#4	0.00958	0.0004196	0.1	No	8	0	No	0.01	Param.
Selenium (mg/L)	Well#3	0.0056	0.00055	0.05	No	8	50	No	0.004	NP (normality)

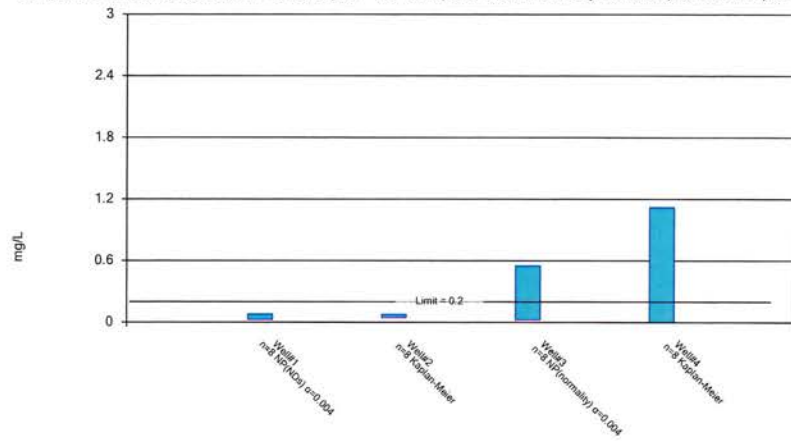
Confidence Interval

BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR Printed 2/12/2024, 4:17 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Selenium (mg/L)	Well#4	0.004282	0.000468	0.05	No	8	25	No	0.01	Param.
Silver (mg/L)	Well#2	0.0023	0.0001	0.1	No	8	75	No	0.004	NP (NDs)
Sulfate (mg/L)	Well#2	133.6	117.9	250	No	8	0	No	0.01	Param.
Sulfate (mg/L)	Well#3	110.2	79.59	250	No	8	0	No	0.01	Param.
Sulfate (mg/L)	Well#4	267	70.5	250	No	8	0	No	0.004	NP (normality)
Thallium (mg/L)	Well#1	0.0009	0.0002	0.002	No	8	87.5	No	0.004	NP (NDs)
Thallium (mg/L)	Well#2	0.0018	0.0002	0.002	No	8	75	No	0.004	NP (NDs)
Thallium (mg/L)	Well#3	0.0012	0.0002	0.002	No	8	87.5	No	0.004	NP (NDs)
Vanadium (mg/L)	Well#3	0.0088	0.00215	0.035	No	8	75	No	0.004	NP (NDs)
Vanadium (mg/L)	Well#4	0.01156	0.002369	0.035	No	8	50	No	0.01	Param.
Zinc (mg/L)	Well#2	0.0211	0.0087	2	No	8	87.5	No	0.004	NP (NDs)
Zinc (mg/L)	Well#3	0.0218	0.0087	2	No	8	87.5	No	0.004	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

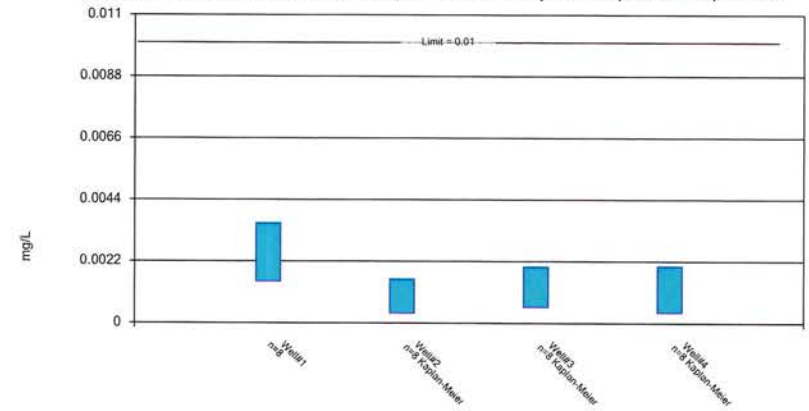
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Aluminum Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric Confidence Interval

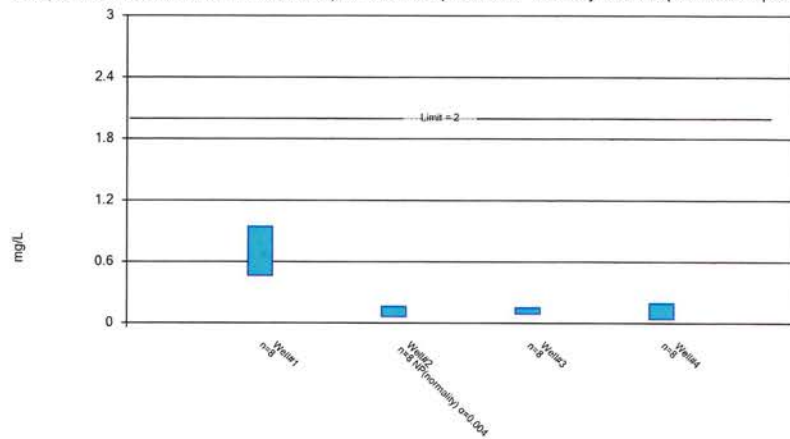
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Arsenic Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

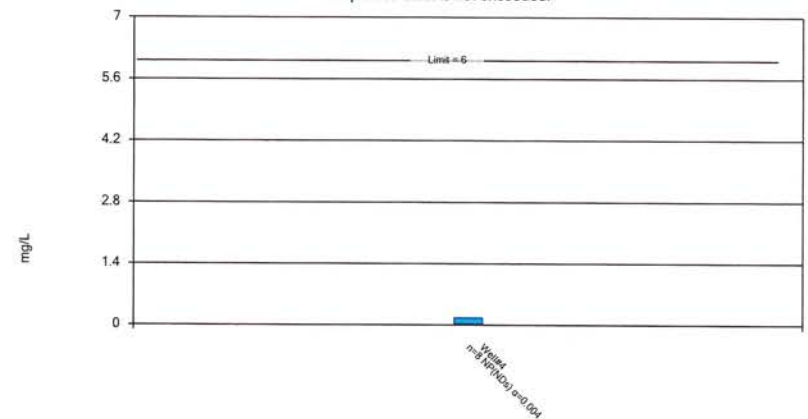
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Barium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

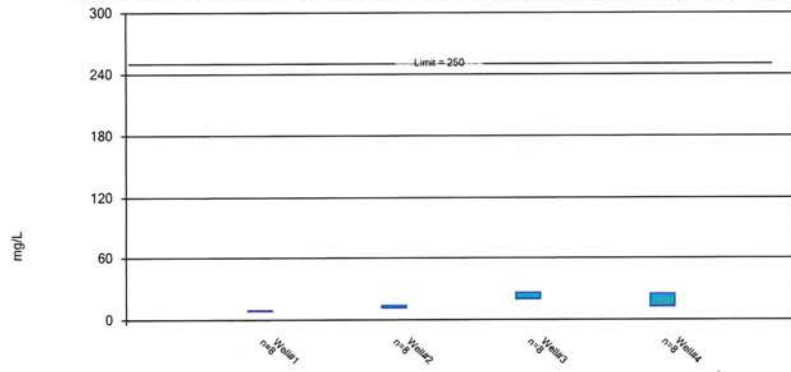
Compliance Limit is not exceeded.



Constituent: Boron Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric Confidence Interval

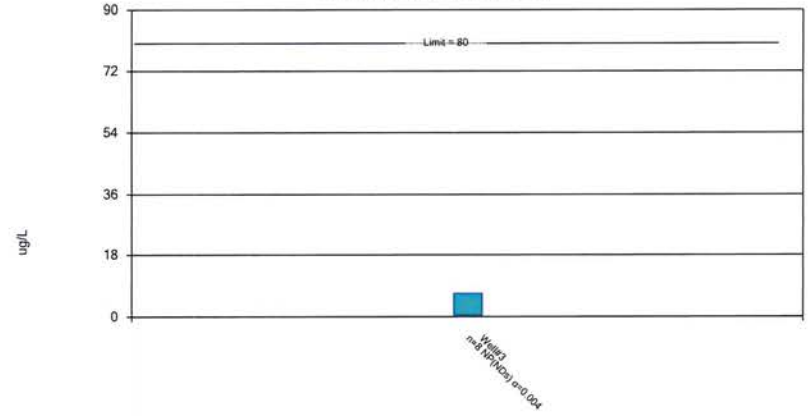
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Chloride Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

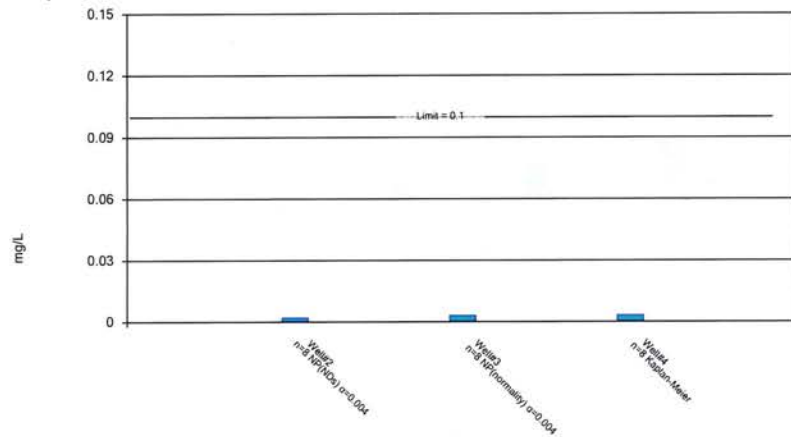
Compliance Limit is not exceeded.



Constituent: Chloroform Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

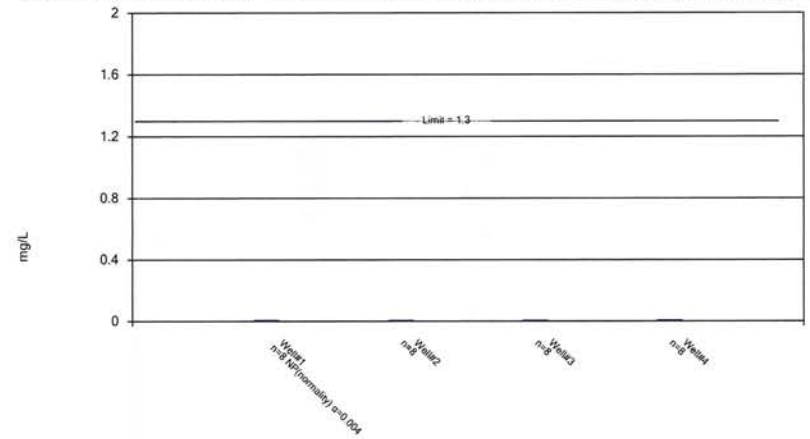
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Chromium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

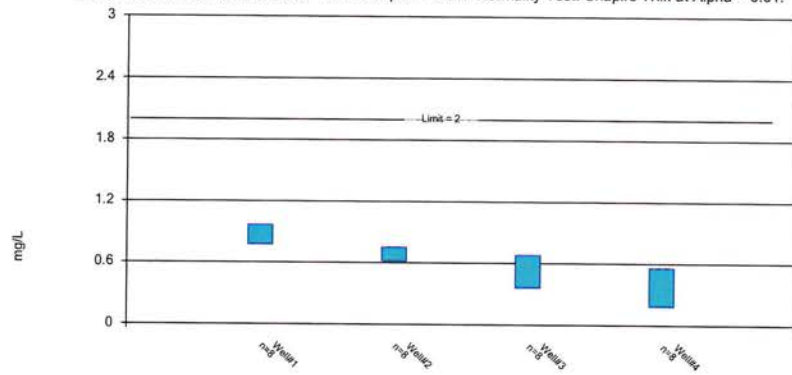
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Copper Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric Confidence Interval

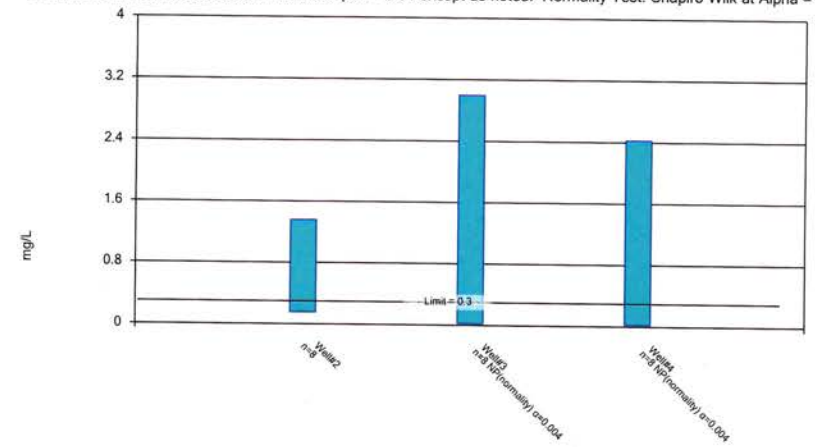
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Fluoride Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

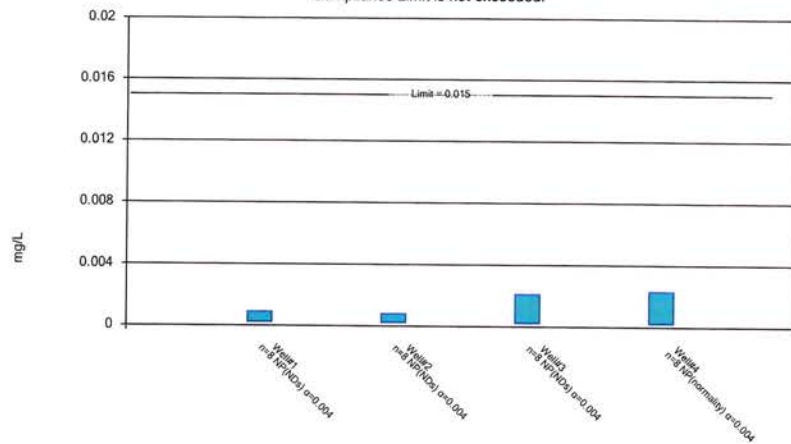
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Iron Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

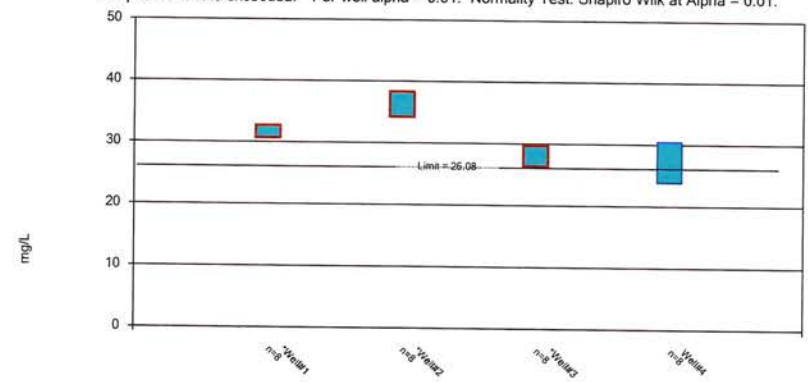
Compliance Limit is not exceeded.



Constituent: Lead Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric Confidence Interval

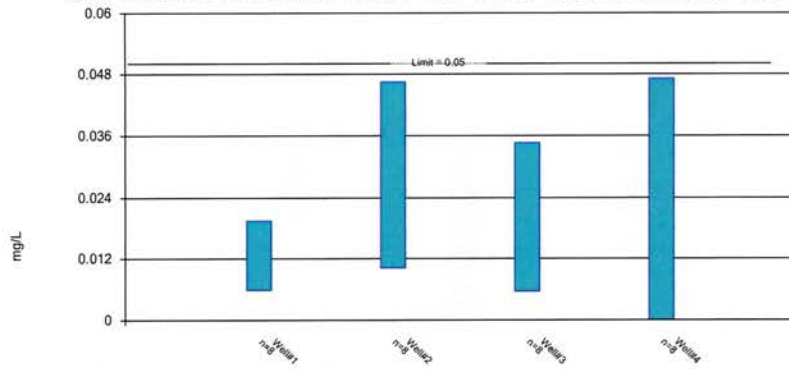
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Magnesium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric Confidence Interval

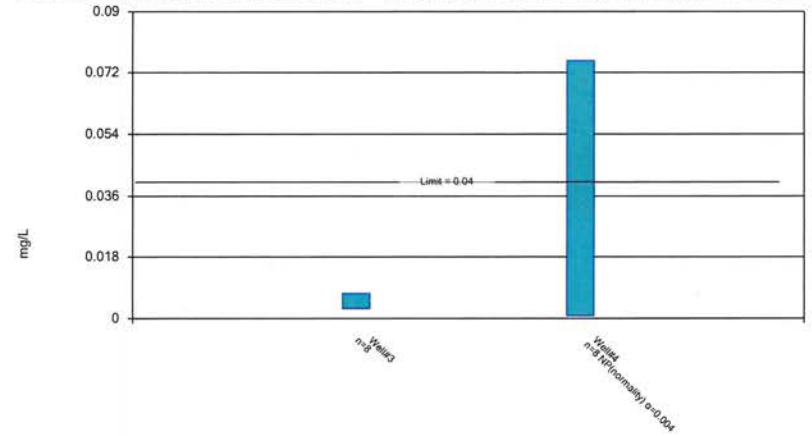
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Manganese Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

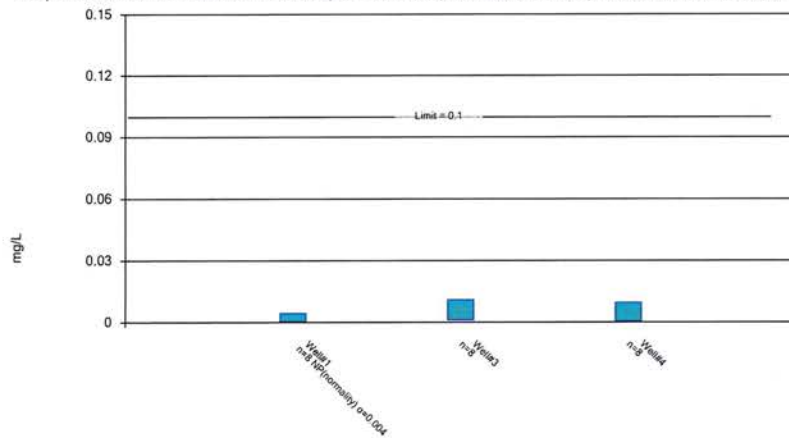
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Molybdenum Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

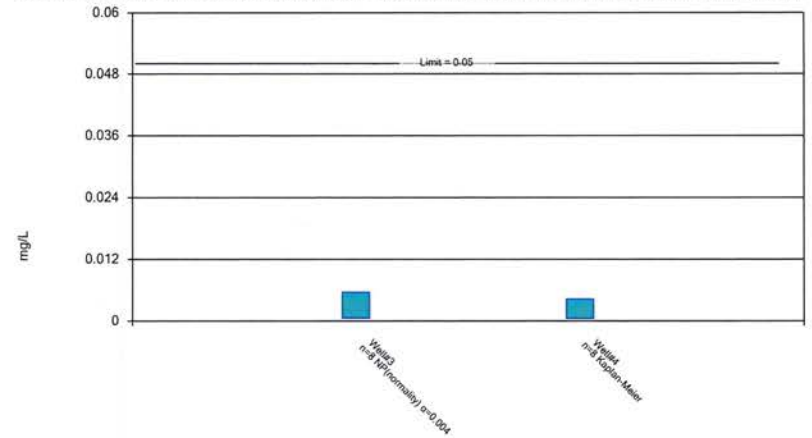
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Nickel Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

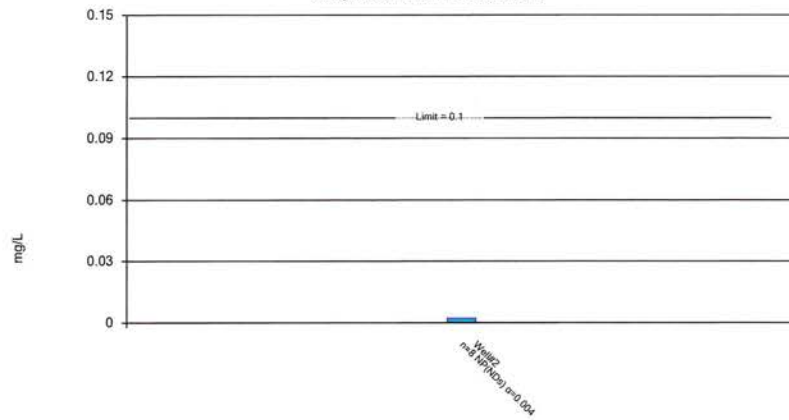
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Selenium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

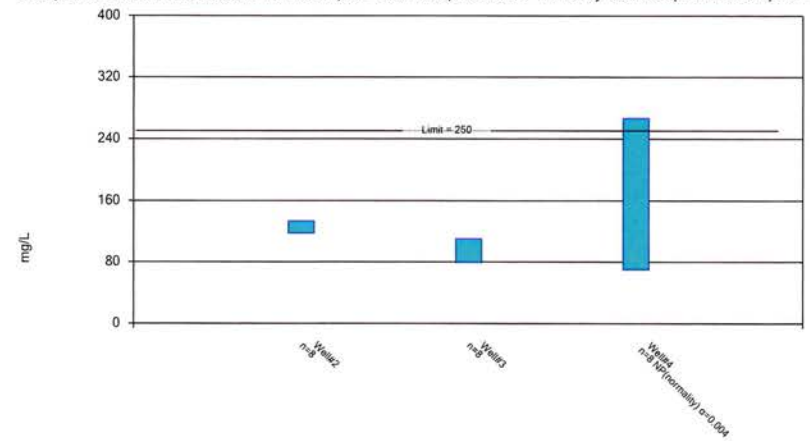
Compliance Limit is not exceeded.



Constituent: Silver Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

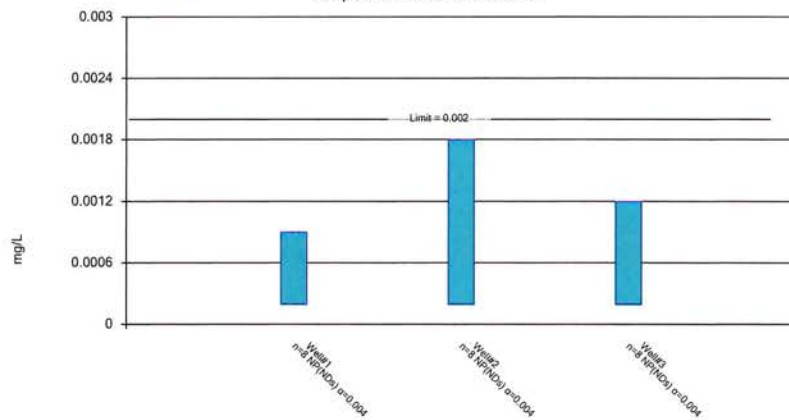
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Sulfate Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

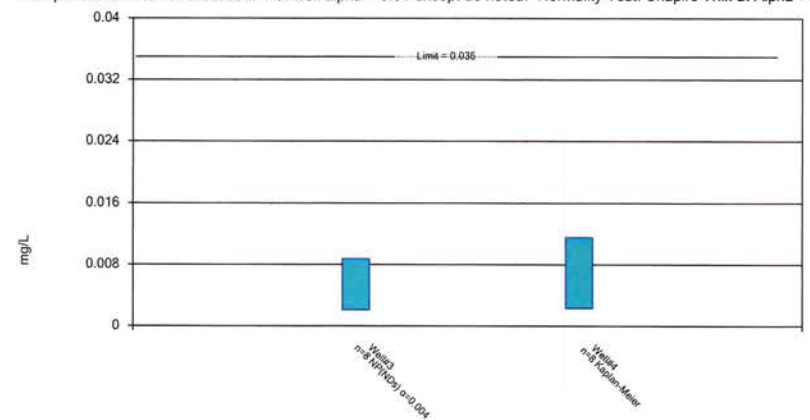
Compliance Limit is not exceeded.



Constituent: Thallium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Parametric and Non-Parametric (NP) Confidence Interval

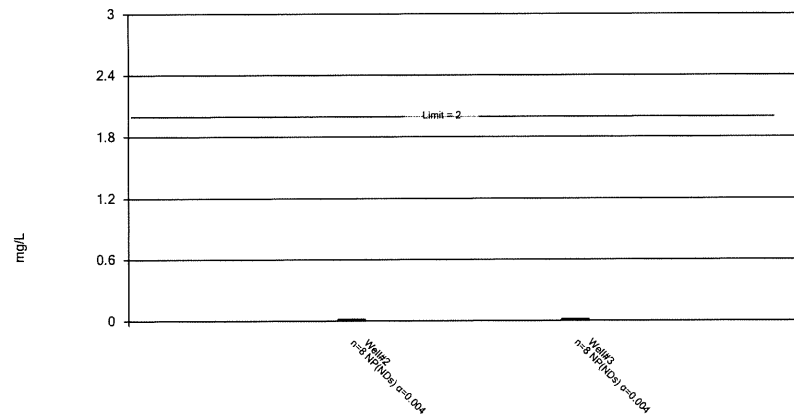
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Vanadium Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Zinc Analysis Run 2/12/2024 4:16 PM View: 2023AWQR - Confidence Interval
BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Attachment E

Theil-Sen Trend Line and Confidence Bands Summary Table and Graphs

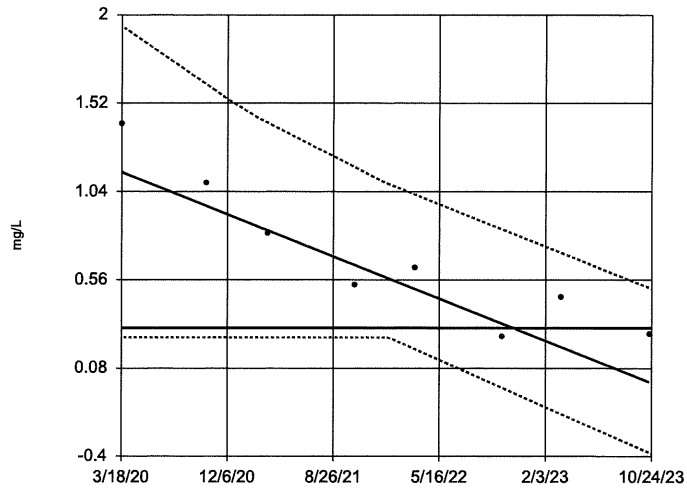
Inertion/Trend Test

BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR Printed 12/22/2023, 9:39 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Alpha</u>	<u>Method</u>
Iron (mg/L)	Well#1	-0.318	-22	-21	Yes	8	0	0.01	NP
Sulfate (mg/L)	Well#1	11.77	26	21	Yes	8	0	0.01	NP

Sen's Slope and 99% Confidence Band

Well#1

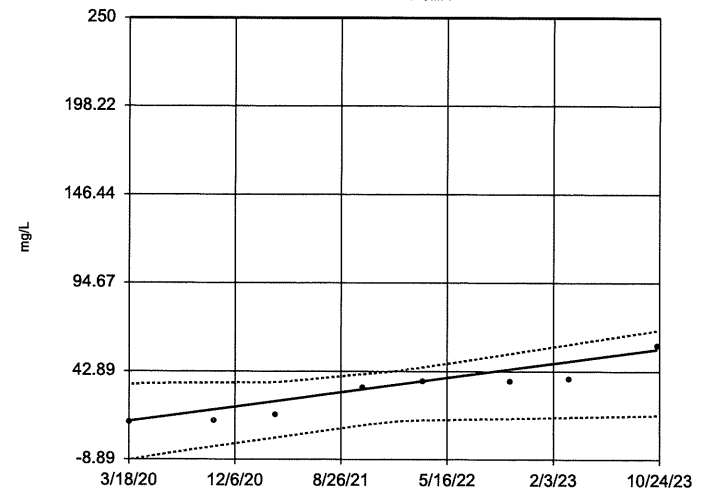


n = 8
 Slope = -0.318
 units per year.
 Mann-Kendall
 statistic = -22
 critical = -21
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).
 SMCL mg/L (0.3) is
 entirely within the
 confidence band.

Constituent: Iron Analysis Run 12/22/2023 9:38 AM View: 2023AWQR - Theil Sen
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Sen's Slope and 99% Confidence Band

Well#1



n = 8
 Slope = 11.77
 units per year.
 Mann-Kendall
 statistic = 26
 critical = 21
 Increasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).
 Confidence band is
 below SMCL mg/L (250).

Constituent: Sulfate Analysis Run 12/22/2023 9:38 AM View: 2023AWQR - Theil Sen
 BMC Quarry CCR Disposal Site Client: SCS Engineers Data: Sanitas ISU CCR-AM 2023AWQR

Appendix E
Mann-Kendall Output ($\alpha = 0.20$)

Monitoring Well	Constituent Name	Calculated Statistic		
		Decreasing Trend	Stable Trend	Increasing Trend
Well#1	Aluminum		-8	
	Arsenic		-8	
	Barium		-10	
	Chloride			15
	Copper		6	
	Fluoride		6	
	Formaldehyde		-11	
	Iron	-22		
	Lead		2	
	Magnesium		-9	
	Manganese	-14		
	Nickel		2	
	Phenols, total			13
	Sulfate			26
Thallium		5		
Well#2	Aluminum		-2	
	Arsenic		11	
	Barium		10	
	Chloride		-9	
	Chromium		0	
	Copper		8	
	Fluoride		7	
	Formaldehyde		-3	
	Iron	-14		
	Lead		-5	
	Magnesium			16
	Manganese		-10	
	Phenols, total		6	
	Silver		6	
Sulfate	-21			
Thallium		7		
Zinc		1		
Well#3	Aluminum		2	
	Arsenic		0	
	Barium		3	
	Chloride		-6	
	Chloroform		-3	
	Chromium		1	
	Copper		6	
	Fluoride		-2	
	Formaldehyde		-3	
	Iron		-12	
	Lead		3	
	Magnesium		-2	
	Manganese		-10	
	Molybdenum		-9	
	Nickel	-18		
	Phenols, total		7	
	Selenium		2	
	Sulfate		9	
Thallium		3		
Vanadium		9		
Zinc		-1		

Monitoring Well	Constituent Name	Calculated Statistic		
		Decreasing Trend	Stable Trend	Increasing Trend
Well#4	Aluminum		1	
	Arsenic		2	
	Barium		12	
	Boron		-7	
	Chloride		10	
	Chromium		8	
	Copper		4	
	Fluoride		5	
	Iron		4	
	Lead			13
	Magnesium		-4	
	Manganese		10	
	Molybdenum		4	
	Nickel		12	
	Phenols, total		7	
	Selenium		0	
	Sulfate		10	
	Vanadium		8	

Section 4. By Product Generator Management Plans.

Copies of the By Product Generator Management Plans are included in this Section as part of the requirement in the BUD Permit. Currently, the only two approved Product Generators contributing materials to the South Quarry Beneficial Use Determination (Quarry Reclamation) Project are John Deere Foundry and University of Iowa Power Plant. The two By-Product Generator Management Plans from these organizations accompany this report.

**BY PRODUCTS GENERATOR
MANAGEMENT PLANS
FOR 2024
[JOHN DEERE]
AND
[UNIVERSITY OF IOWA]**

University of Iowa Power Plant Solid By-Product Management Plan

IAC 567-108.6(2)a. **Sources of the solid by-product.**

The solid by-product (ash) generated at the University of Iowa Power Plant is a result of combustion in two solid fuel boilers: Boilers 10 and 11. 5,000 to 10,000 tons of ash is generated by the plant on an annual basis.

Boiler 10 is a stoker unit that burns approximately 10,000 tons of energy pellets per year generating a combination of bottom ash and fly ash.

Boiler 11 is a circulating fluidized bed boiler. This boiler burns coal, oat hulls, and energy pellets, and uses significant quantities of limestone for sulfur dioxide emissions control. The unit burns approximately 10,000 tons of coal, 20,000 tons of oat hulls, 10,000 tons of energy pellets, and uses approximately 2,500 tons of limestone each year. Boiler 11 produces both bottom ash and fly ash.

IAC 108.6(2)b. **Periodic testing procedure.**

The University will collect composite samples of the combined bottom ash and fly ash from Boiler's 10 and 11, on a quarterly basis for the purpose of verifying that the chemical and physical composition of the ash has not changed significantly. Total metals testing will be carried out in accordance with IAC 567-108.6. The ash will also be analyzed using SPLP (EPA Method 1312), and TCLP (EPA Method 1311.) The list of contaminants tested shall meet the requirements specified by the Iowa Department of Natural Resources for Beneficial Use Determination. Additional ash samples will be collected if there is a significant change in the fuel being burned in either of the solid fuel boilers.

IAC 108.6(2)c. **Description of Storage Procedures.**

(1) All of the ash generated at the plant is combined into a single, enclosed, concrete silo located on the east side of the building. The ash is loaded from the silo into trucks on a regular basis (Monday – Friday) and hauled to the Waterloo South Quarry disposal site near Elk Run Heights, Iowa operated by BMC Aggregates LC (101 BMC Drive, Elk Run Heights, IA 50707). The trucking company used to haul the ash to the BMC Aggregates site is Peterson Contractors, Inc. of Reinbeck, Iowa.

(a) In the event the BMC Aggregates is unable to accept the ash, see Contingency Plan for Ash Material

(2) The design capacity of the silo is 750 tons of ash. The actual achievable maximum is closer to 720 tons due to the configuration of the loading equipment.

(3) The power plant operates under a general National Pollutant Discharge Elimination System storm water permit (# IA-1112-0876). Storm water runoff from the ash loading area is directed to the southern portion of the plant property where it collects and infiltrates into the ground. This prevents runoff of material from the plant property.

(4) The ash truck loading system for the silo utilizes a vacuum system and dust recovery collector to prevent release of ash into the air and on to the ground during truck loading. Spilled material is swept up immediately and disposed of.

(5) Ash is regularly removed from the silo and hauled away for disposal. Failure to continuously remove the ash would allow the silo to quickly fill up and would shut the plant down since there would be no room for additional ash. Maximum storage time would likely never exceed one month.

Revision History

Date	Revision Notes	Person
1/1/2019	Development	M. Maxwell
3/1/2022	Review	M. Gilmartin
10/20/2022	Separated Contingency Plan to separate document	M. Gilmartin
02/26/2024	Updated Fuel and Limestone Quantities	M. Maxwell

University of Iowa Power Plant Contingency Plan for Ash Material

In the event the BMC Aggregates is unable to accept the ash, the University of Iowa Power Plant has an e-mail from the Waste Commission of Scott County agreeing to take the material if necessary. The trucking company used will remain Peterson Contractors, Inc. of Reinbeck, Iowa.

See Attachment of e-mail communication.

Revision History

Date	Revision Notes	Person
10/20/2022	Developed Separate Contingency Plan document. Contingency site changed from Linn County to Scott County.	M. Gilmartin

GILMARTIN Melissa (Engie North America)

From: Reitz, Casey <Casey.Reitz@wastecom.com>
Sent: Thursday, October 13, 2022 3:06 PM
To: GILMARTIN Melissa (Engie North America); WC Special Waste
Cc: MAXWELL Mark (Engie North America)
Subject: ⚠ RE: [EXTERNAL] RE: [EXTERNAL] alternative disposal agreement

Melissa,

We will be able to take it if your main disposal site will not be able to take it. I don't think a profile form is necessary at this time, and if the time comes where you need to bring it to us then it would only take a few minutes to complete the form since I have analytical.

From: melissa.gilmartin@engie.com <melissa.gilmartin@engie.com>
Sent: Thursday, October 13, 2022 2:49 PM
To: Reitz, Casey <Casey.Reitz@wastecom.com>; WC Special Waste <specialwaste@wastecom.com>
Cc: mark.maxwell@engie.com
Subject: [EXTERNAL] RE: [EXTERNAL] alternative disposal agreement

You don't often get email from melissa.gilmartin@engie.com. [Learn why this is important](#)

CAUTION: Be skeptical of links and attachments!

Casey,

We do a quarterly sample, most recent is attached. Also attached is the Linn County Landfill Approval which has a few additional characteristics sampled.

Thanks,

Melissa Gilmartin (*she/her/hers*)

Environmental Engineer
ENGIE North America
Iowa City, IA
Melissa.Gilmartin@engie.com
Phone +1 319 800 2052
Mobile +1 641 485 6116



www.engie-na.com

1 West Prentiss Street
Iowa City, IA 52242
USA

Please consider the environment before printing this message.

From: Reitz, Casey <Casey.Reitz@wastecom.com>
Sent: Thursday, October 13, 2022 2:43 PM

To: GILMARTIN Melissa (Engie North America) <melissa.gilmartin@engie.com>; WC Special Waste <specialwaste@wastecom.com>

Subject: ⚠ RE: [EXTERNAL] alternative disposal agreement

Melissa,

Do you have analytical on this waste?

Thanks,

From: melissa.gilmartin@engie.com <melissa.gilmartin@engie.com>

Sent: Thursday, October 13, 2022 2:41 PM

To: WC Special Waste <specialwaste@wastecom.com>

Subject: [EXTERNAL] alternative disposal agreement

Some people who received this message don't often get email from melissa.gilmartin@engie.com. [Learn why this is important](#)

CAUTION: Be skeptical of links and attachments!

I am with the University of Iowa Power Plant in Iowa City, IA. The facility has a waste stream composed of ash from the two solid fuel boilers. The waste stream currently goes to a site with a beneficial use determination.

We need to develop an alternative disposal agreement in case our existing location is unavailable. We previously had a special waste authorization with Linn County, however they have changed their practices and are no longer able to issue that authorization. We had never shipped material to them.

I see the website shows the application forms including the waste profile form. I assume that is the first step to developing an alternative disposal agreement?

Melissa Gilmartin (*she/her/hers*)

Environmental Engineer
ENGIE North America
Iowa City, IA
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Solid By-Product Management Plan (SBMP)



JOHN DEERE

John Deere Foundry

2000 Westfield Ave
Waterloo, Iowa 50701

February 2024

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Section 1 – Introduction

Objective

This Solid By-Product Management Plan (SBMP) was prepared on behalf of John Deere Foundry of Waterloo, Iowa. The objective of this Management Plan is to fulfill the requirements set forth by 567-108.6 of the Iowa Administrative Code (IAC) regarding foundry sand used as fill material. Contents of this Management Plan describe the management, operation, and reporting procedures.

Facility Operations & Site Location

John Deere Foundry has been operating since 1972. The facility is engaged in the production of gray and ductile iron castings using green sand molds. The process includes the melt down of purchased scrap and preparation of casting molds using foundry sand and manufactured sand cores.

The John Deere Foundry is located adjacent to the Cedar River in Waterloo, Iowa in Sections 22 and 23, T. 89N, R. 13W.

The facility address is:

John Deere Foundry Waterloo
2000 Westfield Ave.
Waterloo, Iowa 50701

Used Foundry Sand & Refractory Brick Generation

John Deere Foundry's authorized by-products include used foundry sand (UFS) and refractory brick (RB). There are two types of UFS generated by John Deere Foundry. One is the mold line sand, which is generated from either overflow from the mold lines, or by-pass sand which is carried off the end of the mold line. The second type is baghouse dust, which is collected by various baghouses at the mold lines, blast, and shakeout areas.

The RB authorized by-product is generated from the re-lining of holding furnaces and transfer ladles; these are lined with refractory brick and mortar. Periodically the brick and mortar are chipped out of the ladle or holding furnace and replaced with new brick – the re-line process. There are two types of refractory brick, silica and alumina brick.

Table 1 identifies and describes the by-products generated at John Deere Foundry that have been authorized for reclamation activities at Waterloo South Quarry under the Iowa Department of Natural Resources Beneficial Use Determination #07-BUD-20-02.

Used foundry sand and refractory brick are not stockpiled on site. All material generated is stored in roll off boxes, small bins, silos, or bunkers. When the container is full it is loaded to a truck, covered, and taken directly to the site.

Used foundry sand and refractory brick that fails to meet the requirements of 567 IAC 108 or BUD #07-BUD-20-02 will be alternatively managed as outlined in Appendix B

Table 1. John Deere Foundry's Authorized By-products

	Sand By-Product Source	Description	Primary Location (End-User Site)	Secondary Location (Disposal Site)
1	Refractory Brick	<i>Bunkered collection point for ladle and holding furnace lining when it is periodically chipped out and replaced. [Bunkered material is loaded onto a truck with end loader.]</i>	<i>Black Hawk County Landfill 07-SWA-028-04</i>	<i>Waterloo South Quarry</i>
2	West Dock Sand	<i>Main collection point for sand leaving the Foundry. Belts carry sand from Mold Line 802, Mold Line 804, Cleaning Room (Dept. 850, 853, & 855), Department 871, Core Room Didion, and Department 789. [West dock sand is stored in an overhead silo and discharged directly onto a truck.]</i>	<i>LeHigh Cement</i>	<i>Waterloo South Quarry Black Hawk County Landfill 07-SWA-105-18</i>
3	802 West Dust Pelletizer	<i>Collection point of main baghouse system for department 802. Major processes controlled include belts, shakeout, lump breaker, attrition mill, sand cooler and mullers. The process also includes a collection point [Bag Splitter] to process material from small dust collectors. All material is processed through a pelletizer which adds moisture to the material for dust control prior to disposal. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
4	East Dust Pelletizer	<i>Collection point of multiple baghouse systems for departments 855 Tumblast, 808 Sand Belts, and 871 Shakeout. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
5	Cleaning Room Dust	<i>Collection point for the baghouse controlling departments 850 and 853 shot blast units. [Trailer]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
6	871 Baghouse Dust	<i>Collection point for Cleaning Room baghouse supporting castings produced on the 804 mold line. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
7	804 Sand System Baghouse Dust	<i>The main dust collection system for processes on 804 mold line. Also captures dust from sand cooler. This may alternatively be transported to the East Sand Pelletizer. [Trailer]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>

John Deere Foundry Beneficial Uses

John Deere Foundry sand and refractory brick is used as beneficial fill material [567 IAC 108.4(6)e and 108.6] at BMC Aggregates Waterloo South Quarry in La Porte City, Iowa. The fill is added to the quarry to within 25 feet of the surface. The detailed quantity of the Foundry's solid by-products that are being beneficially used at the South Quarry are contained in the Annual Beneficial Fill Tonnage Report for John Deere Foundry, Appendix A.

Foundry sand is also sent to Lehigh Cement in Mason City, Iowa for use as a raw material in the manufacture of cement [567 IAC 108.4(6)b].

Section – 2 Sampling and Analysis Procedures

Objective

The purpose of this section is to outline the sampling procedures and methodology, which will be used to ensure that only used foundry sand and refractory brick acceptable for use as fill material, is sent to BMC Aggregates Waterloo South Quarry.

Historical UFS and RB Laboratory Analytical Data

A considerable amount of historical laboratory analytical data already exists for UFS and RB generated by John Deere Foundry. This includes laboratory results for volatile organic compounds (VOCs), metals and base/neutral/acid (BNA) extractable compounds using Toxicity Characteristics Leaching Procedure (TCLP) methodology, and pH. The Iowa Administrative Code requires Synthetic Precipitation Leaching Procedure (SPLP) methodology for metals that cannot exceed 10 times the MCL for Drinking Water Standards and Total Metals for State Standards for Soil including Thallium & Arsenic. For historical analysis, refer to Environmental Office Cabinet Files. Metals are the primary constituents of concern, which have been detected in the used foundry sand and refractory brick produced at the site. Historic total and TCLP laboratory results indicate detectable concentrations of metals in foundry sand including arsenic, barium, and chromium. However, these concentrations are well below TCLP and SPLP regulatory levels.

UFS and RB Management Plan Sampling Program

Sampling Frequency

Periodic UFS and RB sampling analytical data will be used to continually monitor UFS and RB generated by the Foundry and ensures regulatory compliance is maintained for its beneficial use. Quarterly sampling of all beneficial use sources is required to comply with 567-IAC 108.6(1) and Beneficial Use Determination (BUD) #07-BUD-20-02. At renewal of the BUD, additional sampling parameters are required.

UFS AND RB Sample Collection, Handling and Analysis

UFS and RB samples are collected for laboratory analysis as required. UFS and RB is characterized for beneficial use by collecting a representative composite sample of used sand or refractory brick generated by operations performed at the site.

The composite samples have been placed in laboratory provided containers labeled with the following information:

- Sample Identification
- Sampling date and time
- Sampler's name

- Analyses to be performed – (RCRA Total metals, TCLP Metals, TCLP VOC, TCLP SVOC, SPLP)

Chain-of-custody (COC) documentation will be completed by sampling personnel for each sampling event. COC forms will be used to document the possession of and responsibility for the sample, from sample collection to sample analysis. A completed COC record will accompany the sample to the laboratory as documentation of sample collection and handling activities. The COC also identifies the analyses to be performed on the sample. A copy of a COC record is included with every report and kept in the site environmental files.

Quarterly sampling requires analysis for RCRA Total Metals, TCLP Metals, and SPLP. At renewal of the BUD, the following analyses are required: RCRA Total Metals, TCLP Metals, TCLP VOC, TCLP SVOC, and SPLP.

No TCLP pesticide or herbicide analyses have been performed on the used foundry sand and refractory brick since these compounds are not associated with the manufacturing process.

Analytical Results

John Deere Foundry contracts with Keystone Laboratories or Eurofins Laboratories to analyze the used foundry sand and refractory brick.

Laboratory analytical results obtained from the sampling program are used to characterize John Deere Foundry UFS and RB and provide verification monitoring regarding its acceptability for beneficial use applications. UFS and RB are considered acceptable for beneficial use if the analytical criterion set forth in BUD # 07-BUD-20-02 are met.

Noncompliance Actions

Any UFS and RB that do not meet applicable regulatory standards will be managed alternatively as detailed in the Contingency Plan, Appendix B. Any analytical exceedance will be reported to the DNR and BMC Aggregates Waterloo South Quarry, within ten (10) *business* days of receiving the results from the laboratory.

Foundry Operation Modifications Effecting UFS and RB

John Deere Foundry will document significant changes or modifications of Foundry operations, which may affect the acceptability of UFS and RB for beneficial use. UFS and RB generated by these modified Foundry operations will not be transferred to the beneficial use sites until compliance criteria outlined in BUD # 07-BUD-20-02 and this Management Plan have been met. Used sand generated from the modified process will also be subject to initial sampling and DNR approval prior to beneficial use application. Upon receipt of acceptable analytical results, the DNR and beneficial use site will be notified that the new used foundry sand and/or refractory brick waste stream will be sent for beneficial use. Quarterly sampling requirements will apply to the new used foundry sand and/or refractory brick waste stream.

Section – 3 UFS and RB Storage Site Management

Objective

The purpose of this section is to describe the procedures associated with management of the UFS and RB storage site. The following includes: Storage locations and inventory and pollution prevention measures which will be utilized to address fugitive dust and storm water discharge.

Storage Procedures

Storage Locations

The storage sites are located within enclosed areas accessible only through John Deere Foundry property. Access to UFS and RB in the storage areas will take place under the direct supervision of authorized John Deere Foundry personnel. All John Deere Foundry personnel associated with UFS and RB storage and beneficial use operations at the foundry are familiar with the requirements of this Management Plan.

Inventory

The amount of UFS and RB transferred out of the storage areas will be tracked using weights of the sand and refractory brick taken to beneficial use sites. The volume of UFS and RB removed from the facility and taken to the beneficial use sites will be determined by invoices that include weights from the contracted hauler and fill site. Since the roll-off boxes are filled with sand directly at the point of generation, the amount generated is the same as the amount hauled out to the beneficial use sites.

Pollution Prevention Controls

Fugitive Dust Management

Control of fugitive dust after dispersion is highly problematic. Therefore, control measures used at the John Deere Foundry site will focus on minimizing the amount of fugitive dust dispersed during storage and handling of the UFS and RB. John Deere Foundry operates under Title V permit #02-TV-012R2-M001. Control measures which will be used at the site for fugitive dust control fall into three general categories including administrative control measures, non-structural control measures, and structural control measures. The following describes the specific control measures which will be implemented for the John Deere Foundry storage sites.

Administrative Controls – Administrative controls which will be used at the site to control and minimize the formation of fugitive dust will include:

- Visual inspection of the storage sites and surrounding areas. Periodic visual inspection of the facility grounds, operations, and housekeeping practices will be used as a tool for identifying any operational concerns associated with UFS and RB storage and handling activities at the site.

- Making employees aware of proper procedures for UFS and RB storage and handling practices, equipment operations, visual inspection, preventative procedures, and good housekeeping.

Non-Structural Controls – Non-structural controls which will be used at the site to control and minimize the formation of fugitive dust will include:

- Implementation of proper materials handling practices to reduce the volume of fugitive dust generation by UFS and RB operations. Handling of the UFS and RB will be minimal to avoid excessive fugitive dust formation.
- Preventative practices involving close control of plant operations and equipment to prevent fugitive dust generation.
- Good housekeeping practices will be used to maintain a clean and orderly work environment. This will result in minimizing the amount of fugitive dust generated at the site and reduce safety hazards to personnel. Good housekeeping measures will include: (1) prompt cleanup of any UFS and RB spilled outside the storage area; and (2) regular maintenance of the storage site area in an effort to keep UFS and RB from migrating outside the designated storage area.
- Accumulated UFS and RB will be reused as soon as possible to prevent long term storage and avoid overstocking problems. The maximum UFS storage (residence) time is not to exceed six months.

Structural Controls – Containment or structural controls which will be used at the site to control the formation of fugitive dust will include:

- No material is to be placed directly onto the ground in the pelletizer bunkers.
- The plan requires cleaning out and sweeping the enclosed areas of the pelletizers underneath the drop chute and approach apron frequently enough that there are no significant accumulations and, that any potential for air entrainment of fugitive dust is kept to a minimum.
- Transport vehicles are to be tarped prior to leaving the loadout area to minimize spillage and drag out.
- Where appropriate, the overhead door is to be kept closed at all times except during loadout.

Storm Water Management

Measures similar to those described for fugitive dust control have been implemented for storm water pollution prevention. Storm water pollution prevention measures developed for the John Deere Foundry Waterloo facility as part of our storm water National Pollution Discharge Elimination System (NPDES) permitting process and outlined in the Storm Water Pollution Prevention Plan (SWPPP) are also implemented at the site. Best management practices presented in the SWPPP are being employed to address storm water run-on, run-off or containment related to the UFS and RB storage areas. Authorization for storm water discharge has been

granted to John Deere Foundry by the Iowa Department of Natural Resources (IDNR) under NPDES General Permit Number: IA-5166-4999. Discharge authorization coverage is effective through February 28, 2023. Documentation of IDNR's approval to discharge stormwater is provided in the Environmental Office files.

Table 2. John Deere Foundry's Authorized By-products Storage Location and Controls

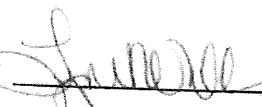
	Sand By-Product Source	Storage Location / Maximum Anticipated Inventory	Stormwater Controls⁺⁺	Air Controls⁺⁺	Maximum Storage Time⁺
1	Refractory Brick	Melt Dept. /Truckload	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months
2	West Dock Sand	West Dock /Silo	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months
3	802 West Dust Pelletizer	Dept. 802/Roll-off	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months
4	East Dust Pelletizer	Dept. 871/Roll-off	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months
5	Cleaning Room Dust	Cleaning Room /Trailer	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months
6	871 Baghouse Dust	Dept. 871/Roll-off	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months

	Sand By-Product Source	Storage Location / Maximum Anticipated Inventory	Stormwater Controls**	Air Controls**	Maximum Storage Time*
7	804 Sand System Baghouse Dust	Dept. 804 /Trailer	DNR General Permit #1, Authorization # 5166-4999; Storm water Pollution Prevention Plan (SWPPP)	Current DNR Title V Operating Permit	<6 months

*Maximum Storage Time – John Deere Foundry does not stockpile material. Once storage containers become full, the container is hauled off-site to the appropriate end-user or disposal site.

**Stormwater and Air Controls – John Deere Foundry stores all materials under roof. Roll-offs and bunkers are completely enclosed by roof and walls. Trailers are enclosed with a small portion of the trailer sitting slightly beyond the bay door opening. Trailers are not completely enclosed within the walls of the building; all trailers are covered while being filled to prevent migration of material.

Section 4 – Operations Manager Signature

Approved By: 
 Lynette Telleen,
 Foundry Operations Manager

Date: 2/20/24

Appendix A

Annual Beneficial Fill Tonnage Report

Appendix B

Contingency Plan

Annual Solid By-Product Beneficial Use Report

In accordance with Section 108.7(3)b of the Iowa Administrative Code, this report has been prepared, and is intended as a Calendar Year 2022 summary on the tons of solid by-product (used foundry sand and refractory brick) generated by John Deere Foundry and sent to the following location for beneficial use:

BENEFICIAL USE LOCATION: BMC Aggregates, L.C..
Waterloo South Quarry

SOLID BY-PRODUCT FOR CY2023: Tons
USE: Fill Material [567 IAC 108.6(1)]

Annual Solid By-Product Use Report

All weights are reported as tons per month with calculated totals for the year.

Monthly weight tickets summaries are kept within the offices of the JDFW Environmental Department and are available for review by IDNR personnel upon request.

All sample data is kept within the offices of the JDFW Environmental Department and is available for review by IDNR personnel upon request.

If you need any additional information, or have any questions or comments concerning this report, please contact Kim Hinebaugh at (319) 292-5791 or HinebaughKimberlyS@Johndeere.com.

Source Name	Used Foundry Sand								Refractory Brick	TOTAL Solid By-Products
	East Dust Pelletizer	802 West Dust Pelletizer	808 Inside ETA	Cleaning Room Dust	West Dock Sand	804 Sand System Baghouse Dust	871 Baghouse Dust	TOTAL Foundry Sand		
Month	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons
Jan	142.38	917.99	0	82.57	1291.67	608.35	202.02	3244.98	0	3,245.0
Feb	140.83	876.02	0	106.16	1296.66	742.3	202.17	3364.14	0	3,364.1
Mar	125.38	1078.28	0	106.06	988.14	799.93	228.36	3326.15	0	3,326.2
Apr	117.45	1075.67	0	112.96	940.25	612.56	219.54	3078.43	0	3,078.4
May	130.32	1109.14	0	85.73	370.89	691.36	239.66	2627.1	0	2,627.1
Jun	118.65	983.27	0	97.12	711.13	896.51	225.07	3031.75	0	3,031.8
Jul	113.75	689.54	0	56.36	32.04	440.02	132.54	1464.25	0	1,464.3
Aug	128.4	989.81	0	57.93	160.43	805.17	284.96	2426.7	0	2,426.7
Sept	164.35	1028.43	0	103.77	419.05	810.2	231.33	2757.13	0	2,757.1
Oct	146.86	1024.73	0	90.5	823.25	847.83	234.9	3168.07	0	3,168.1
Nov	146.59	797.61	0	96.58	89.81	649.27	188.02	1967.88	0	1,967.9
Dec	138.84	716.71	0	86.01	404.14	626.29	209.01	2181	0	2,181.0
2023 Totals	1,613.8	10,369.2	0.0	1,081.8	7,527.5	8,529.8	2,597.6	32,637.6	0.0	32,637.6

Contingency Plan for UFS and RB



JOHN DEERE

Section 1 - Introduction

Objective

The objective of this Contingency Plan is to fulfill the requirements set forth by Rule 567- 108 of the Iowa Administrative Code (IAC) and Special Condition 9 of Iowa Department of Natural Resources Beneficial Use Determination #07-BUD-20-02 (issued January 2, 2023). This detailed Contingency Plan will outline alternative management options that have been identified for John Deere Foundry's authorized by-products that fail to meet applicable regulatory standards. Contents will also describe the management, sampling, and reporting procedures for authorized by-products.

John Deere Foundry's used foundry sand and refractory brick are authorized by-products for quarry reclamation activities at Waterloo South Quarry located at 11305 South Dysart Road, La Porte City, Iowa 50651. Foundry sand is also sent to Lehigh Cement in Mason City, Iowa for use as a raw product in the manufacture of cement [567-108.4(6)b].

Facility Operations & Site Location

John Deere Foundry has been operating since 1972. The facility is engaged in the production of gray and ductile iron castings using green sand molds. The process includes melt down of purchased scrap and preparation of casting molds using foundry sand and manufactured sand cores.

John Deere Foundry is located adjacent to the Cedar River in Waterloo, Iowa in Sections 22 and 23, T. 89N, R. 13W.

The facility address is: John Deere Foundry Waterloo 2000 Westfield Ave.
Waterloo, Iowa 50701

Used Foundry Sand & Refractory Brick Generation

John Deere Foundry's authorized by-products include used foundry sand and refractory brick. There are two types of used foundry sand generated by John Deere Foundry. One is the mold line sand, which is generated from either overflow from the mold lines, or by-pass sand which is carried off the end of the mold line. The second type is baghouse dust, which is collected by various baghouses at the mold lines, blast, and shakeout areas.

The refractory brick authorized by-product is generated from the re-lining of holding furnaces and transfer ladles; these are lined with refractory brick and mortar.

Periodically the brick and mortar are chipped out of the ladle or holding furnace and replaced with new brick. There are two types of refractory brick, silica and alumina brick.

Table 1 identifies and describes the by-products generated at John Deere Foundry that have been authorized for reclamation activities at Waterloo South Quarry under the Iowa Department of Natural Resources Beneficial Use Determination # 07-BUD-20-02.

Table 1. John Deere Foundry's Authorized By-products

	Sand By-Product Source	Description	Primary Location (End-User Site)	Secondary Location (Disposal Site)
1	Refractory Brick	<i>Bunkered collection point for ladle and holding furnace lining when it is periodically chipped out and replaced. [Bunkered material is loaded onto a truck with end loader.]</i>	<i>Black Hawk County Landfill</i>	<i>Waterloo South Quarry</i>
2	West Dock Sand	<i>Main collection point for sand leaving the Foundry. Belts carry sand from Mold Line 802, Mold Line 804, Cleaning Room (Dept. 850 & 853), Core Room Didion, and Department 789. [West dock sand is stored in an overhead silo and discharged directly onto a truck.]</i>	<i>LeHigh Cement</i>	<i>Waterloo South Quarry Black Hawk County Landfill 07-SWA-105-18</i>
3	802 West Dust Pelletizer	<i>Collection point of main baghouse system for department 802. Major processes controlled include belts, shakeout, lump breaker, attrition mill, sand cooler and mullers. The process also includes a collection point [Bag Splitter] to process material from small dust collectors. All material is processed through a pelletizer which adds moisture to the material for dust control prior to disposal. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
4	East Dust Pelletizer	<i>Collection point of multiple baghouse systems for departments 855 Tumblast, 808 Sand Belts, and 871 Shakeout. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
5	Cleaning Room Dust	<i>Collection point for the baghouse controlling departments 850 and 853 shot blast units. [Trailer]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
6	871 Baghouse Dust	<i>Collection point for Cleaning Room baghouse supporting castings produced on the 804 mold line. [Roll-off]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>
7	804 Sand System Baghouse Dust	<i>The main dust collection system for processes on 804 mold line. Also captures dust from sand cooler. This may alternatively be transported to the East Sand Pelletizer. [Trailer]</i>	<i>Waterloo South Quarry</i>	<i>Black Hawk County Landfill 07-SWA-105-18</i>

Those authorized by-products identified in Table 1 that fail to meet applicable regulatory standards specified in 567-108 IAC and the Iowa Department of Natural Resources Beneficial Use Determination #07-BUD-20-02 will be disposed of at the Black Hawk County Landfill. This sanitary landfill is located at 1509 East Washburn Road, Waterloo, Iowa. The landfill requires an approved and active special waste authorization (SWA) prior to receipt of any materials. The corresponding SWA's for each authorized by-product are listed in Table 1. Prior to shipment of by-products to the Black Hawk County Landfill, the landfill Administrator will be notified and supplied the most recent analytical data. John Deere Foundry will coordinate with contracted trucking companies, Rite Environmental and Peterson Contractors, on re-routing of the failed authorized by-products. A copy of the approved SWA must accompany each shipment of the by-product to the Black Hawk County Landfill.

In the unusual scenario that an authorized by-product fails for any TCLP Metals, the authorized by-products will have to be shipped to a Veolia or US Ecology hazardous waste facility for disposal. Each container of hazardous material will be sampled and profiled independently prior to shipment.

Section 2 – Analytical Exceedance Actions

Analytical data for authorized by-products that exceed applicable regulatory standards for any RCRA Total Metals will be further evaluated for an unacceptable risk level as determined by the Iowa Cumulative Risk Calculator using the "Site worker" exposure scenario. Iowa Law (567 IAC 137.10(7)) allows for the application of cumulative risk criteria in lieu of compliance with specific standards for individual contaminants in soil. John Deere Foundry will cease delivery of those authorized by-products to Waterloo South Quarry that fail the Site Worker' exposure for the Iowa Cumulative Risk Calculator. Authorized by-products that fail to meet an acceptable risk level determined by the Iowa Cumulative Risk Calculator for any RCRA Total Metals will be delivered to Black Hawk County Landfill.

Occasionally total chrome has exceeded the regulatory level for beneficial use. However, when analyzed further to distinguish between Chrome III and Chrome VI, the results yield Chrome III.

Authorized by-products that exceed applicable regulatory levels for any SPLP will be delivered to Black Hawk County Landfill.

The issuance of Iowa Department of Natural Resources Beneficial Use Determination #07-BUD-20-02 required John Deere Foundry, the by-product generator, to analyze authorized by-products for TCLP-SVOC and TCLP-VOC to inform the end-users groundwater monitoring program. All analytical data for TCLP-SVOC and TCLP-VOC were well below regulatory limits.

UFS and RB have historically shown to be below applicable regulatory standards for any TCLP Metals. Authorized by-products that exceed applicable regulatory levels for any TCLP Metals will have to be managed and disposed of as a hazardous waste.

Any analytical data for an authorized by-product that exceeds the applicable regulatory standard will be reported to the Iowa DNR and the end-user, Waterloo South Quarry, within ten (10) business days of receipt of laboratory data.

Additional and more frequent sampling will be performed to re-establish acceptability for beneficial use. Prior to resuming beneficial reuse of an authorized by-product that failed to comply with applicable regulatory standards, John Deere Foundry will notify Iowa DNR and Waterloo South Quarry in writing of a return to compliance. The written notification will include at a minimum the certified laboratory reports and a narrative discussion regarding the circumstances surrounding the documented exceedance. After review, concurrence, and notification from Iowa DNR, John Deere Foundry may resume beneficial use of the referenced authorized by-products

Section 3 – Operations Manager Signature

Approved By: _____

Lynette Telleen,

Date: 2/10/24 _____

Section 4 – Revision Log

Objective

The objective of this revision log is to track the changes that occur in this plan.

Date	Description of Change
03/28/2018	Original Plan issuance
2/4/2020	Updated plan for CY20. Updated to brand compliance.
12/10/2021	Updated plan for CY2022; removed 808 Inside ETA waste stream.
10/10/2022	Updated plan for CY2023
2/15/24	Updated plan for CY 2024; removed Martin Foundry Service as an Approved location, updated Chrome IV for the correct Chrome VI

Section 5. By Product Generators Product Brought to Site.

As requested by DNR, all products from the By Product Generators are listed in this Section along with the quantities received for placement of these products for the calendar year 2023. For this time period from March 2023 to February 2024, the beneficial use products listed in this Section, Quarterly Tested by approved Laboratory Facilities, were brought to BMC Beneficial Use location at the South Quarry location located on Dysart Rd. Note from previous communications, Deere received permission from DNR to combine some products into a new determination to correlate with the Deere manufacturing process. For the University of Iowa, all products remained the same as in previous years and were part of the products brought to the Beneficial Use Site for this time period.

Deere Foundry (Waterloo, Iowa) and the University of Iowa were the only By-Product Generators bringing material to the BMC, BUD site for the calendar year, 2023.

**BY PRODUCTS GENERATOR
PRODUCTS BROUGHT TO SITE
2023
[JOHN DEERE]
AND
[UNIVERSITY OF IOWA]**

2023 JOHN DEERE BUD PRODUCT TONAGE

John Deere Product Description	BMC product #	Qty	Unit
JD EAST PELLETIZER DUST	302E	1591.54	TON
JD WEST PELLETIZER DUST	302W	11297.98	TON
JD WEST DOCK SAND	303	7090.91	TON
JD CLEANING ROOM DUST	310	1079.24	TON
JD 804 SAND SYSTEM BAGHOUSE DUST	316	8498.42	TON
JD 871 BAGHOUSE DUST	317	2572.93	TON

TOTAL OF ALL PRODUCTS

32131.02

2023 U of I BUD PRODUCT TONAGE

Product Description	BMC Product #	Qty	Unit
FLY ASH	311	4482.53	TON

TOTAL OF ALL PRODUCTS 4482.53

Section 6. Map of Site and Product Placement.

The latest aerial imagery shows the progression of the fill. As in previous reports to the IDNR, beginning in 2018, the fill progression has not progressed much beyond the initial boundaries of the 2018 imagery. As noted in other locations in this report, the current fill has been limited to the Deere Foundry products and the University of Iowa CCR materials. As indicated in the last couple of reports, BUD project quantities of material have decreased as a result of periodic redirection of West Dock Materials from Deere to the Cement Plant in Mason City. As a result, the fill area has not significantly changed as noted in the contours and the aerial photo.

Although this aerial was Droned in December of 2023, very little has changed in terms of added fill material. This site was visited this past year by Deere Management for an update on the fill progression.

As mentioned in earlier reports the lateral extent of the potential fill area is fairly extensive. In addition to the lateral extension to the south in the BUD area, there is also the capability for vertical expansion to the elevation of the land area denoted by the berm surrounding the fill area. The contour lines on the accompanying aerial photo suggest the potential height increase for some future date.

The landscape and drainage scenarios remain as indicated in the original application. Currently and for many years into the future, the fill area to the south will continue to be the location of the deposition of the BUD materials prior to any increase in the overall height of the fill site.

**SITE MAP UPDATE
DECEMBER 2023**

LEGEND



This recent aerial view of the BUD site at the BMC Aggregates South Quarry Facility is very similar to other aeriels for past years. Note the open area in the south portion of the aerial photo; this part of the site is roughly 100' deep and given the area yet to be filled this site will be active for many years into the future. There is some fill for both the ash and the foundry materials occurring on top of the site however even this part of the fill is still 20-30' from reaching the point of some type of reclamation. The original plan is to complete the fill in the south portion of the site with any final slopes and contours gently sloping to the north. However this is still many years away. The actual fill process has declined significantly as a result of the loss of Iowa State and University of Northern Iowa Fly ash and the transfer of a considerable amount of West Dock Foundry material from John Deere to the Cement Plants in Mason City.

582ft/us



Site: 8301 Waterloo South

Survey: 05 Dec 2023 Fly Ash

File created: Feb 7, 2024

BUD Site Aerial Map

#07-BUD-20-02
December 5, 2023



Section 7. Brief Summary of Report.

A) The quarterly reporting of the By Product Generator Test results in the form of the Analytical Testing Reports have been documented against the Laboratory Reports from the Testing Labs utilized by the By Product Generators. All of this information has been filed with the DNR at the time of each of these tests by the By Product Generator and reviewed by the End User (BMC) as well. Any corrections in the data or notification of Risk Calculator use has been documented in earlier communications between the DNR, By Product Generators, and the End User prior to the completion of this report.

B) SCS Engineering Consultants receive the data from Keystone Labs Testing using the Field Sampling completed by the End User for the 5 monitoring wells that are part of this BUD Permit. SCS provides the documentation and statistical analysis review required by DNR for this project with reference to the End User obligations.

C) A review of the SCS Report which is included in this submission to IDNR did not indicate any statistical issues or concerns with any of the test results from the 5 monitoring wells for this project. Paragraph 3.5 in the accompanying SCS 2023 Water Quality Report which accompanies this Report indicated “ *Review of the data indicated the beneficial use project is not having a significant adverse effect on the groundwater at South Quarry as represented by ground samples collected from the monitoring wells associated with the South Quarry.*”

The SCS recommendation included continuing sampling the Four Monitoring Wells on site along with the Upgradient Well using the same time frame of March and October in 2024, as in the past.

**BMC AGGREGATES
MONITORING WELL ANALYSIS
FOR 2023
[KEYSTONE LABS]**

**BMC AGGREGATES
MONITORING WELL SAMPLING
TEST RESULTS
FOR MARCH
2023**



BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #1
1GC1696-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane			96.3 %		79-129	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			102 %		66-134	"	"	"	"	
Surrogate: Toluene-d8			97.7 %		91-113	"	"	"	"	
Surrogate: 4-Bromofluorobenzene			96.4 %		83-112	"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.060		0.035	"	"	1GC1174	03/22/23	03/23/23	EPA 420.1	
Solids, total dissolved	341		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	ND		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

Determination of Inorganic Anions

Chloride	10.1	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.9		0.1	"	"	"	"	"	"	
Sulfate	38.0	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.050		0.050	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Arsenic, total	0.0040	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	1.08	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0011	0.0007	0.0020	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



BMC Aggregates L.C. Elk Run Heights, IA 50707 101 BMC Drive	Project: GW Monitoring Project Number: Miller Creek Area Project Manager: Sherman Lundy	Reported: 03/31/23 16:23
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Well #1
1GC1696-01(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Total Metals

Copper, total	0.0084	0.0008	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Iron, total	0.463	0.047	0.100	"	1	1GC1081	03/22/23	03/22/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	31.5	0.06	0.10	"	"	1GC1081	03/22/23	03/22/23	200.7	
Manganese, total	0.0142	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	ND	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0044	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0008	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	ND	0.0011	0.0040	"	"	"	"	"	"	
- Thallium, total	0.0009	0.0004	0.0008	"	"	"	"	"	"	
- Vanadium, total	0.0051	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	0.0182	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #2
1GC1696-02(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane			92.8 %	79-129		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4			95.1 %	66-134		"	"	"	"	
Surrogate: Toluene-d8			106 %	91-113		"	"	"	"	
Surrogate: 4-Bromofluorobenzene			104 %	83-112		"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.060		0.035	"	"	1GC1244	03/23/23	03/27/23	EPA 420.1	
Solids, total dissolved	456		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS 1-1750-85	
Solids, total suspended	4		2	"	2	1GC1088	03/22/23	03/22/23	USGS 1-3765-85	

Determination of Inorganic Anions

Chloride	13.3	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.7		0.1	"	"	"	"	"	"	
Sulfate	116	1.8	5.0	"	5	1GC1235	03/22/23	03/22/23	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	ND		0.050	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Arsenic, total	0.0024	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.162	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1081	03/22/23	03/22/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0009	0.0007	0.0020	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #2
1GC1696-02(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Total Metals

Copper, total	0.0041	0.0008	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Iron, total	0.439	0.047	0.100	"	1	1GC1081	03/22/23	03/22/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	37.0	0.06	0.10	"	"	1GC1081	03/22/23	03/22/23	200.7	
Manganese, total	0.0648	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	ND	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0017	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	ND	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	ND	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	0.0006	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0058	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	20.3	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.2		0.1	"	"	"	"	"	"	
Sulfate	120	1.8	5.0	"	5	1GC1235	03/22/23	03/22/23	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.549		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0026	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.180	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	0.0007	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0031	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0089	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	0.441	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	25.3	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0299	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0060	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0046	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0011	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0056	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0088	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.7 %	79-129		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			100 %	66-134		"	"	"	"	
<i>Surrogate: Toluene-d8</i>			102 %	91-113		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			94.9 %	83-112		"	"	"	"	

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			84.1 %	19-139		"	"	"	"	
<i>Surrogate: Phenol-d6</i>			57.9 %	14-154		"	"	"	"	
<i>Surrogate: 2,4,6-Tribromophenol</i>			82.7 %	21-151		"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	0.021		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Solids, total dissolved	445		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	2		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #3
1GC1696-03RE1(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Conventional Chemistry Parameters

Phenols. total	ND		0.035	mg/L	1	1GC1550	03/29/23	03/30/23	EPA 420.1	
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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	24.1	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.5		0.1	"	"	"	"	"	"	
Sulfate	109	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	0.074		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0029	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.203	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	ND	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	0.0005	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0022	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0068	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	0.243	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	29.2	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0468	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0091	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0146	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0009	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	0.0010	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0029	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0066	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	ND	0.0174	0.0200	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.3 %	79-129		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			96.3 %	66-134		"	"	"	"	
<i>Surrogate: Toluene-d8</i>			99.1 %	91-113		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			102 %	83-112		"	"	"	"	

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			85.7 %	19-139		"	"	"	"	
<i>Surrogate: Phenol-d6</i>			60.4 %	14-154		"	"	"	"	
<i>Surrogate: 2,4,6-Tribromophenol</i>			84.4 %	21-151		"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Solids, total dissolved	479		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS 1-1750-85	
Solids, total suspended	ND		2	"	2	1GC0951	03/20/23	03/20/23	USGS 1-3765-85	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Well #4
1GC1696-04RE1(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Conventional Chemistry Parameters

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Phenols, total	ND		0.035	mg/L	1	1GC1550	03/29/23	03/30/23	EPA 420.1	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Upgradient Well
1GC1696-05(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Inorganic Anions

Chloride	26.8	0.3	1.0	mg/L	1	1GC1118	03/21/23	03/21/23	EPA 9056	
Fluoride	0.5		0.1	"	"	"	"	"	"	
Sulfate	56.0	0.4	1.0	"	"	"	"	"	"	

Determination of Total Metals

Silver, total	ND	0.0015	0.0020	mg/L	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Aluminum, total	ND		0.050	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Arsenic, total	0.0025	0.0006	0.0020	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Barium, total	0.267	0.0002	0.0020	"	"	"	"	"	"	
Beryllium, total	ND	0.0001	0.0020	"	"	"	"	"	"	
Boron, total	ND	0.056	0.100	"	1	1GC1082	03/22/23	03/23/23	EPA 200.7	
Cadmium, total	0.00009	0.00008	0.0002	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Cobalt, total	ND	0.0005	0.0020	"	"	"	"	"	"	
Chromium, total	0.0012	0.0007	0.0020	"	"	"	"	"	"	
Copper, total	0.0820	0.0008	0.0020	"	"	"	"	"	"	
Iron, total	ND	0.047	0.100	"	1	1GC1082	03/22/23	03/23/23	200.7	
Mercury, total	ND	0.00013	0.00020	"	"	1GC1159	03/22/23	03/24/23	SM 3112B	
Magnesium, total	23.6	0.06	0.10	"	"	1GC1082	03/22/23	03/23/23	200.7	
Manganese, total	0.0034	0.0017	0.0040	"	4	1GC1180	03/22/23	03/23/23	EPA 200.8	
Molybdenum, total	0.0044	0.0006	0.0020	"	"	"	"	"	"	
Nickel, total	0.0034	0.0007	0.0040	"	"	"	"	"	"	
Lead, total	0.0040	0.0005	0.0008	"	"	"	"	"	"	
Antimony, total	ND	0.0008	0.0020	"	"	"	"	"	"	
Selenium, total	0.0037	0.0011	0.0040	"	"	"	"	"	"	
Thallium, total	ND	0.0004	0.0008	"	"	"	"	"	"	
Vanadium, total	0.0067	0.0043	0.0080	"	"	"	"	"	"	
Zinc, total	0.118	0.0174	0.0200	"	"	"	"	"	"	

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BMC Aggregates L.C.
Elk Run Heights, IA 50707
101 BMC Drive

Project: GW Monitoring
Project Number: Miller Creek Area
Project Manager: Sherman Lundy

Reported:
03/31/23 16:23

Upgradient Well
1GC1696-05(Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Keystone Laboratories - Newton

Determination of Volatile Organic Compounds

Benzene	ND		1.0	ug/L	1	1GC0950	03/18/23	03/18/23	EPA 624	
Chloroform	ND		1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: Dibromofluoromethane</i>			94.9 %	79-129		"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>			95.3 %	66-134		"	"	"	"	
<i>Surrogate: Toluene-d8</i>			106 %	91-113		"	"	"	"	
<i>Surrogate: 4-Bromofluorobenzene</i>			101 %	83-112		"	"	"	"	

Determination of Base/Neutral Extractable Compounds

Pyridine	ND		10	ug/L	1	1GC0973	03/20/23	03/30/23	EPA 625	
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Determination of Acid Extractable Compounds

2-Methylphenol (o-Cresol)	ND		10.0	ug/L	1	1GC0973	"	03/30/23	EPA 625	
(3 & 4)-Methylphenol	ND		10.0	"	"	"	"	"	"	
<i>Surrogate: 2-Fluorophenol</i>			85.5 %	19-139		"	"	"	"	
<i>Surrogate: Phenol-d6</i>			58.9 %	14-154		"	"	"	"	
<i>Surrogate: 2,4,6-Tribromophenol</i>			76.1 %	21-151		"	"	"	"	

Determination of Carbonyl Compounds

Formaldehyde	ND		10.0	ug/L	1	1GC0912	03/17/23	03/20/23	EPA 8315	
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Determination of Conventional Chemistry Parameters

Total Organic Halogens (TOX)	ND		0.010	mg/L	1	1GC1683	03/28/23	03/31/23	EPA 9020	
COD, total	ND		20	"	"	1GC1411	03/28/23	03/29/23	EPA 410.4	
Nitrogen, Ammonia	ND		0.10	"	"	1GC1594	03/30/23	03/30/23	TIMBERLIN E	
Phenols, total	0.057		0.035	"	"	1GC1244	03/23/23	03/27/23	EPA 420.1	
Solids, total dissolved	360		5	"	13.33333	1GC1028	03/20/23	03/21/23	USGS I-1750-85	
Solids, total suspended	2		2	"	2	1GC0951	03/20/23	03/20/23	USGS I-3765-85	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**BMC AGGREGATES
MONITORING WELL SAMPLING
TEST RESULTS
FOR OCTOBER
2023**

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Analytical Testing Parameters

Client Sample ID: Well #1	
Sample Matrix: Water	Collected By: Sherman Lundy
Lab Sample ID: 1GJ1657-01	Collection Date: 10/18/2023 8:00

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: Dibromofluoromethane	93.9	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: 1,2-Dichloroethane-d4	96.2	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: Toluene-d8	96.5	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1349	LNH
Surrogate: 4-Bromofluorobenzene	99.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1349	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 1943	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 1943	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: 2-Fluorophenol	70.1	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: Phenol-d6	54.5	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 1943	EPP
Surrogate: 2,4,6-Tribromophenol	103	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 1943	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1107	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK

Method: EPA 420.1									
Phenols, total	0.047	0.024	0.035	mg/L	1			11/01/23 1336	AKK

Method: EPA 9020									
Total Organic Halogens (TOX)	0.018	0.006	0.010	mg/L	1	TOX-3	11/09/23 0000	11/14/23 1207	LNH

Method: SM 2510B

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #1	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:00
Lab Sample ID: 1GJ1657-01	

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Conductivity	589	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS
Method: TIMBERLINE									
Nitrogen, Ammonia	1.51	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1509	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	369	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	<1	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.9	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Chloride	9.8	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Sulfate	58.1	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1227	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.265	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Magnesium, total	30.9	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1716	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Arsenic, total	0.0015	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Barium, total	0.371	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Copper, total	0.0032	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Manganese, total	0.0055	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Molybdenum, total	0.0010	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Nickel, total	0.0013	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Selenium, total	<0.0011	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2300	RVV

Keystone Laboratories - Newton
 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Well #1	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:00
Lab Sample ID: 1GJ1657-01	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2300	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1706	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #2	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:30
Lab Sample ID: 1GJ1657-02	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: Dibromofluoromethane	93.9	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: 1,2-Dichloroethane-d4	95.9	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: Toluene-d8	97.9	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Surrogate: 4-Bromofluorobenzene	99.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1644	LNH
Determination of Base/Neutral Extractable Compounds									
Method: EPA 625									
Pyridine	<13	13	13	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
Determination of Acid Extractable Compounds									
Method: EPA 625									
2-Methylphenol (o-Cresol)	<12.8	3.4	12.8	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
(3 & 4)-Methylphenol	<12.8	3.3	12.8	ug/L	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: 2-Fluorophenol	70.9	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: Phenol-d6	63.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Surrogate: 2,4,6-Tribromophenol	97.4	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2007	EPP
Determination of Carbonyl Compounds									
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1126	EPP
Determination of Conventional Chemistry Parameters									
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.066	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	0.016	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	695	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #2		Collected By: Sherman Lundy
Sample Matrix: Water		Collection Date: 10/18/2023 8:30
Lab Sample ID: 1GJ1657-02		

Determination of Conventional Chemistry Parameters

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1510	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	481	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	8	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA

Determination of Inorganic Anions

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.7	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1303	MID
Chloride	12.4	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1303	MID
Sulfate	120	1.8	5.0	mg/L	5		10/27/23 0000	10/27/23 1736	MID

Determination of Total Metals

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.573	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Magnesium, total	40.1	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1741	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Arsenic, total	0.0009	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Barium, total	0.0817	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Copper, total	0.0030	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Manganese, total	0.0107	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Molybdenum, total	<0.0006	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Nickel, total	0.0012	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Selenium, total	<0.0011	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Silver, total	0.0019	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2324	RVV

Keystone Laboratories - Newton
 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Well #2	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 8:30
Lab Sample ID: 1GJ1657-02	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2324	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1716	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #3	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:00
Lab Sample ID: 1GJ1657-03	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: Dibromofluoromethane	94.0	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: 1,2-Dichloroethane-d4	97.0	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: Toluene-d8	96.9	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1707	LNH
Surrogate: 4-Bromofluorobenzene	97.6	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1707	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2032	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2032	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: 2-Fluorophenol	69.6	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: Phenol-d6	51.5	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2032	EPP
Surrogate: 2,4,6-Tribromophenol	102	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2032	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1145	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK

Method: EPA 420.1									
Phenols, total	0.063	0.024	0.035	mg/L	1			11/01/23 1336	AKK

Method: EPA 9020									
Total Organic Halogens (TOX)	0.054	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH

Method: SM 2510B									
Conductivity	612	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #3		Collected By: Sherman Lundy
Sample Matrix: Water		Collection Date: 10/16/2023 9:00
Lab Sample ID: 1GJ1657-03		

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	0.12	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1515	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	400	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	10	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
Determination of Inorganic Anions	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.6	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Chloride	23.8	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Sulfate	100	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1322	MID
Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	0.055	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Magnesium, total	30.8	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Method: EPA 200.7									
Aluminum, total	<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1758	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Arsenic, total	0.0009	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Barium, total	0.0957	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Beryllium, total	<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Chromium, total	<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Cobalt, total	<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Copper, total	0.0051	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Lead, total	<0.0005	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Manganese, total	0.0072	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Molybdenum, total	0.0028	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Nickel, total	0.0026	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Selenium, total	0.0014	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Vanadium, total	<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2342	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #3	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:00
Lab Sample ID: 1GJ1657-03	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2342	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1718	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Well #4	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04	

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: Dibromofluoromethane	92.2	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: 1,2-Dichloroethane-d4	96.3	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: Toluene-d8	97.8	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1730	LNH
Surrogate: 4-Bromofluorobenzene	99.2	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1730	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2056	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2056	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: 2-Fluorophenol	73.9	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: Phenol-d6	62.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2056	EPP
Surrogate: 2,4,6-Tribromophenol	97.5	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2056	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1204	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK

Method: EPA 420.1									
Phenols, total	0.035	0.024	0.035	mg/L	1			11/01/23 1336	AKK

Method: EPA 9020									
Total Organic Halogens (TOX)	<0.010	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH

Method: SM 2510B									
Conductivity	672	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #4		Collected By: Sherman Lundy
Sample Matrix: Water		Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04		

Determination of Conventional Chemistry Parameters

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: TIMBERLINE									
Nitrogen, Ammonia	<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1516	LJS
Method: USGS I-1750-85									
Total Dissolved Solids (TDS)	459	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
Method: USGS I-3765-85									
Total Suspended Solids (TSS)	36	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA

Determination of Inorganic Anions

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 9056									
Fluoride	0.3	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1340	MID
Chloride	20.0	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1340	MID
Sulfate	111	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1340	MID

Determination of Total Metals

	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: 200.7									
Iron, total	2.43	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Magnesium, total	26.1	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Method: EPA 200.7									
Aluminum, total	1.83	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Boron, total	<0.056	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1804	JAR
Method: EPA 200.8									
Antimony, total	<0.0008	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Arsenic, total	0.0020	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Barium, total	0.109	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Beryllium, total	0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Cadmium, total	<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Chromium, total	0.0050	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Cobalt, total	0.0015	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Copper, total	0.0073	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Lead, total	0.0023	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Manganese, total	0.0678	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Molybdenum, total	0.0040	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Nickel, total	0.0061	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Selenium, total	0.0036	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Silver, total	<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Thallium, total	<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Vanadium, total	0.0095	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2348	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Well #4	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 9:30
Lab Sample ID: 1GJ1657-04	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	<0.0174	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2348	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1720	JAR

Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ1657

Client Sample ID: Upgradient Well
Sample Matrix: Water
Lab Sample ID: 1GJ1657-05

Collected By: Sherman Lundy
Collection Date: 10/18/2023 10:00

Determination of Volatile Organic Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 5030B/EPA 624									
2-Butanone (MEK)	<10.0	1.4	10.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Chloroform	<1.0	0.4	1.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Benzene	<1.0	0.3	1.0	ug/L	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: Dibromofluoromethane	93.4	Limit: 79-129		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: 1,2-Dichloroethane-d4	97.2	Limit: 66-134		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: Toluene-d8	96.6	Limit: 91-113		% Rec	1		10/25/23 0000	10/25/23 1752	LNH
Surrogate: 4-Bromofluorobenzene	98.3	Limit: 83-112		% Rec	1		10/25/23 0000	10/25/23 1752	LNH

Determination of Base/Neutral Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
Pyridine	<10	10	10	ug/L	1		10/23/23 1114	10/31/23 2121	EPP

Determination of Acid Extractable Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 625									
2-Methylphenol (o-Cresol)	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2121	EPP
(3 & 4)-Methylphenol	<10.0	2.6	10.0	ug/L	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: 2-Fluorophenol	82.5	Limit: 19-139		% Rec	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: Phenol-d6	73.4	Limit: 14-154		% Rec	1		10/23/23 1114	10/31/23 2121	EPP
Surrogate: 2,4,6-Tribromophenol	101	Limit: 21-151		% Rec	1		10/23/23 1114	10/31/23 2121	EPP

Determination of Carbonyl Compounds	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 8315									
Formaldehyde	<10.0	10.0	10.0	ug/L	1		10/20/23 1311	10/23/23 1223	EPP

Determination of Conventional Chemistry Parameters	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Method: EPA 410.4									
COD, total	<54	9	54	mg/L	1		10/28/23 1828	11/01/23 1533	AKK
Method: EPA 420.1									
Phenols, total	0.082	0.024	0.035	mg/L	1			11/01/23 1336	AKK
Method: EPA 9020									
Total Organic Halogens (TOX)	<0.010	0.006	0.010	mg/L	1		11/09/23 0000	11/10/23 1011	LNH
Method: SM 2510B									
Conductivity	636	1.8	2.0	uS/cm	1		10/23/23 1122	10/23/23 1325	BSS

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ1657

Client Sample ID: Upgradient Well	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 10:00
Lab Sample ID: 1GJ1657-05	

Determination of Conventional Chemistry Parameters

Method: TIMBERLINE

Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
<0.10	0.08	0.10	mg/L	1		10/24/23 1622	10/26/23 1517	LJS

Method: USGS I-1750-85

425	4	5	mg/L	1		10/20/23 1254	10/23/23 0825	MEA
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Method: USGS I-3765-85

<1	0.9	1	mg/L	1		10/20/23 1305	10/23/23 1120	MEA
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Determination of Inorganic Anions

Method: EPA 9056

0.3	0.02	0.1	mg/L	1		10/27/23 0000	10/27/23 1358	MID
35.0	0.3	1.0	mg/L	1		10/27/23 0000	10/27/23 1358	MID
109	0.4	1.0	mg/L	1		10/27/23 0000	10/27/23 1358	MID

Determination of Total Metals

Method: 200.7

<0.047	0.047	0.100	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
20.8	0.06	0.10	mg/L	1		10/24/23 0755	10/25/23 1809	JAR

Method: EPA 200.7

<0.050	0.038	0.050	mg/L	1		10/24/23 0755	10/25/23 1809	JAR
0.058	0.056	0.100	mg/L	1		10/24/23 0755	10/25/23 1809	JAR

Method: EPA 200.8

0.0009	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0006	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.116	0.0002	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0001	0.0001	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.00008	0.00008	0.0002	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0007	0.0007	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0005	0.0005	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0067	0.0008	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0007	0.0005	0.0008	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0017	0.0017	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0063	0.0006	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0018	0.0007	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
0.0035	0.0011	0.0040	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0015	0.0015	0.0020	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0004	0.0004	0.0008	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
<0.0043	0.0043	0.0080	mg/L	4		10/23/23 0937	10/23/23 2354	RVV

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 CERTIFICATE OF ANALYSIS
 1GJ1657

Client Sample ID: Upgradient Well	Collected By: Sherman Lundy
Sample Matrix: Water	Collection Date: 10/18/2023 10:00
Lab Sample ID: 1GJ1657-05	

Determination of Total Metals	Result	MDL	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Zinc, total	0.0304	0.0174	0.0200	mg/L	4		10/23/23 0937	10/23/23 2354	RVV
Method: SM 3112B									
Mercury, total	<0.00013	0.00013	0.00020	mg/L	1		10/20/23 0844	10/20/23 1722	JAR