

2018 Annual Groundwater Monitoring and Corrective Action Report

Zero Liquid Discharge Pond
Ottumwa Generating Station
20775 Power Plant Road
Ottumwa, Iowa

Prepared for:



Interstate Power and Light Company
4902 N. Biltmore Lane
Madison, Wisconsin 53718

SCS ENGINEERS

25219072.19 | August 1, 2019

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Madison, WI 53718-6751
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1.0 INTRODUCTION

This 2018 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*; Final Rule, dated April 17, 2015 (USEPA, 2015) and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e) and 40 CFR 257.100 for inactive CCR surface impoundments. The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2018 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

This report covers the period of groundwater monitoring from January 18, 2017, through December 31, 2018. January 18, 2017, is the date of the first background sampling round. All future annual reports will cover the period from January 1 through December 31 of the previous year.

The groundwater monitoring system for the Zero Liquid Discharge Pond (ZLDP) at the Ottumwa Generating Station (OGS) monitors a single inactive CCR unit:

- OGS ZLDP (inactive CCR surface impoundment)

The system is designed to detect monitored constituents at the waste boundary of the OGS ZLDP as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one upgradient and three downgradient monitoring wells.

2.0 §257.100(E)(5) GROUNDWATER MONITORING AND CORRECTIVE ACTION FOR INACTIVE CCR SURFACE IMPOUNDMENTS

The owner or operator of the inactive CCR surface impoundments must: (i) No later than April 17, 2019, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and (ii) No later than August 1, 2019, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

This report is submitted to fulfill the initial report requirement.

3.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. . . . For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility’s operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

3.1 §257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A map showing the ZLDP and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**. The location of the OGS ash pond CCR unit is also shown on **Figure 2**.

3.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed and no wells were decommissioned as part of the groundwater monitoring program for the OGS ZLDP in 2018. Upgradient monitoring well MW-301 was installed on November 10, 2015. Downgradient monitoring wells MW-307, MW-308, and MW-309 were installed on October 25-27, 2016.

The background monitoring well, MW-301, is also used in the groundwater monitoring system for the OGS ash pond, an existing CCR surface impoundment.

3.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Eight groundwater samples were collected from each CCR monitoring well for the establishment of background. For the three downgradient monitoring wells (MW-307, MW-308, and MW-309), background sampling began in January 2017 and concluded in October 2018. Background samples were analyzed for both Appendix III and Appendix IV constituents. A summary including the number of groundwater samples that were collected for analysis for each downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs is included in **Table 1**. The results of the analytical laboratory analyses are provided in the laboratory reports in **Appendix A1** through **Appendix A8**.

3.4 §257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);

There were no transitions between monitoring programs in 2018.

Background monitoring for the upgradient well (MW-301) was previously completed because this well also serves as a background well for the OGS ash pond, an existing CCR surface impoundment. Background monitoring results for MW-301 were included in the 2017 Annual Groundwater Monitoring and Corrective Action Report for the OGS ash pond, and 2018 results were included in the 2018 Annual Report.

3.5 §257.90(E)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in *italics*, followed by applicable information relative to the 2018 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

3.5.1 §257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

Status of Groundwater Monitoring and Corrective Action Program. In 2018, groundwater monitoring and corrective action program was in background monitoring.

Summary of Key Actions Completed. Collection of background groundwater quality data was completed.

Description of Any Problems Encountered:

- During the April 2018 sampling event, the samples from monitoring wells MW-307, MW-308, and MW-309 were not analyzed for total dissolved solids (TDS) because the lab did not meet the TDS hold time requirements.
- During the June 2018 sampling event, the samples from monitoring wells MW-307, MW-308, and MW-309 were not analyzed for sulfate, chloride, fluoride, pH, and TDS, because the ice in one of the coolers melted before the samples reached the laboratory.

Discussion of Actions to Resolve the Problems:

- To resolve the April 2018 holding time issue, the three downgradient monitoring wells were resampled for TDS analysis in May 2018.
- To resolve the June 2018 analyses issue, the three downgradient monitoring wells were resampled for sulfate, chloride, fluoride, pH, and TDS in July 2018.

Projection of Key Activities for the Upcoming Year (2019):

- Initiation of Detection Monitoring no later than April 17, 2019.
- Two semi-annual groundwater sampling and analysis events (April and October 2019).
- Statistical evaluation and determination of any statistically significant increases (SSIs) for the April 2019 monitoring event (by 7/15/2019) and for the October 2019 monitoring event (by 1/15/2020).

- If an SSI is determined, then within 90 days either
 - Complete alternative source demonstration (if applicable), or
 - Establish an assessment monitoring program

3.5.2 §257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not Applicable. No alternative detection monitoring frequency has been proposed.

3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not Applicable. No alternative source demonstration was completed in 2018.

3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not Applicable. Assessment monitoring has not been initiated, and no alternative assessment monitoring frequency has been proposed.

3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not Applicable. Assessment monitoring was not performed in 2018.

3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not Applicable. Assessment monitoring has not been initiated, and no alternative source demonstration for assessment monitoring was completed in 2018.

3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not Applicable. Corrective measures assessment has not been initiated.

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Table 1
CCR Rule Groundwater Samples Summary

**Table 1. CCR Rule Groundwater Samples Summary
Ottumwa Generating Station ZLDP / SCS Engineers Project #25219072.19**

Sample Dates	Downgradient Wells			Background Well*
	MW-307	MW-308	MW-309	MW-301
1/18-19/2017	B	B	B	B
4/19-20/2017	B	B	B	B
6/20-21/2017	B	B	B	B
8/21-23/2017	B	B	B	B
11/8/2017	B	B	B	B
4/16-18/2018	B	B	B	B
5/30/2018	B-R	B-R	B-R	-
6/28/2018	B	B	B	-
7/18/2018	B-R	B-R	B-R	-
10/16/2018	B	B	B	B
Total Samples	8	8	8	7

Abbreviations:

B = Background sampling event

B-R = Resample for Background Monitoring Program

Notes:

Detection monitoring will be initiated after completion of background monitoring.

*Background monitoring results for MW-301 were previously submitted in the 2017 and 2018 annual reports for the OGS ash pond CCR unit, including the events listed above and four sampling events in 2016.

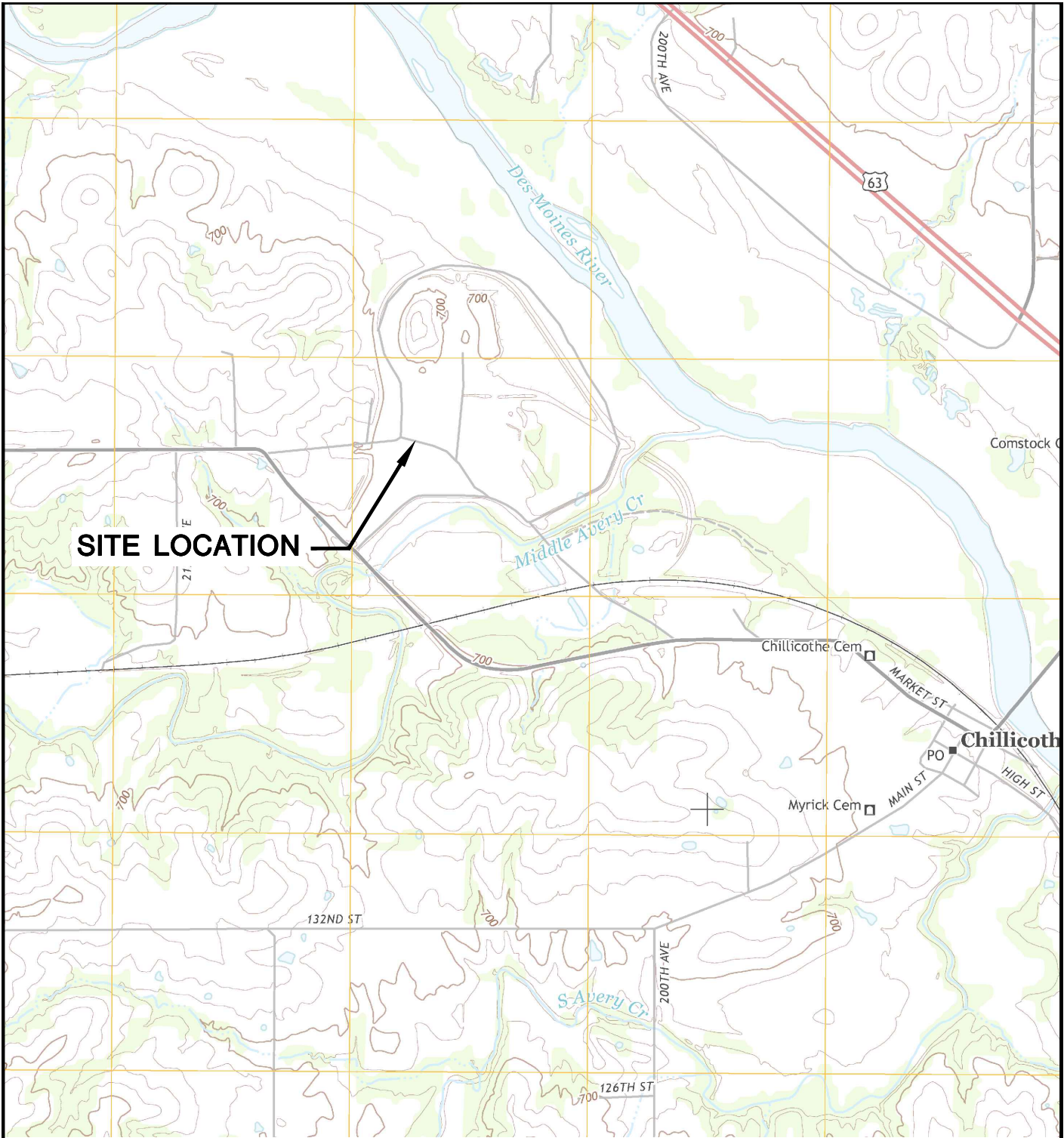
Created by: JR
 Last revision by: ACW
 Checked by: NDK

Date: 6/5/2019
 Date: 6/28/2019
 Date: 6/28/2019

I:\25219072.00\Deliverables\2018 Federal Annual Report-OGS ZLDP\[Table 1
 GW_Samples_Summary_Table_ZLDP.xlsx]GW Summary

Figures

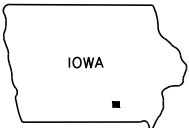
- 1 Site Location Map
- 2 Monitoring Well Locations Map



SITE LOCATION

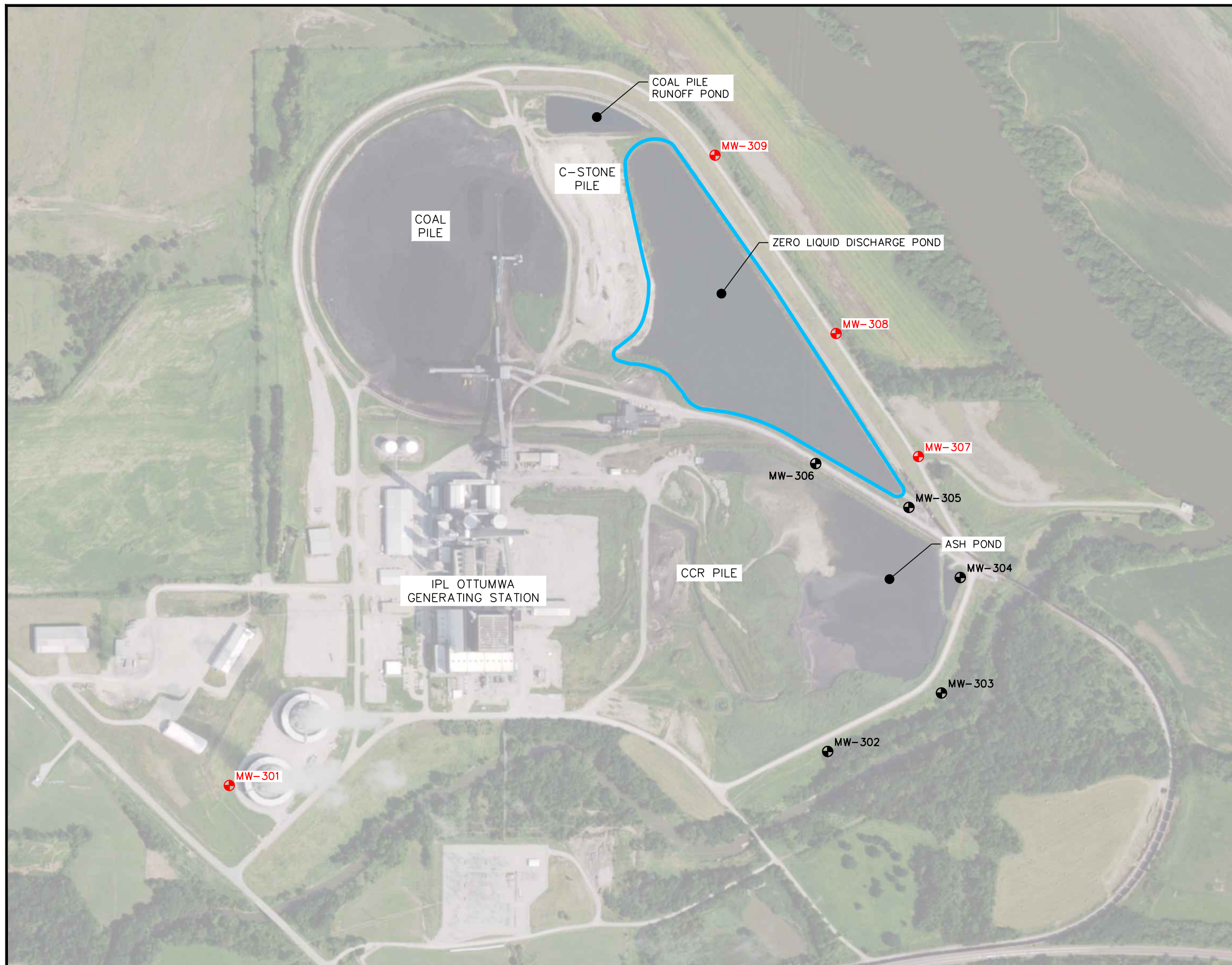


CHILLICOTHE QUADRANGLE
 IOWA—WAPELLO CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2013
 SCALE: 1" = 2,000'



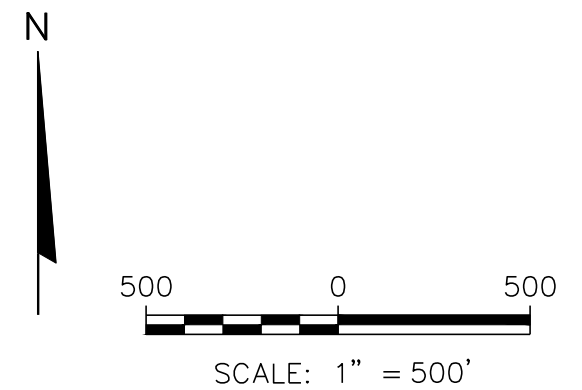
CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501		SITE	OTTUMWA GENERATING STATION OTTUMWA, IOWA		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25216148.00		DRAWN BY:	AHB		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
	DRAWN:	05/29/15		CHECKED BY:	KK			1
REVISED:	12/29/16	APPROVED BY:	TK 04/09/19					

I:\25216148.00\Drawings\Site Loc.dwg, 4/9/2019 10:45:31 AM




LEGEND	
	ZERO LIQUID DISCHARGE POND (ZLDP)
	ZLDP MONITORING WELL
	ADDITIONAL MONITORING WELL

- NOTES:
1. MONITORING WELLS MW-301, MW-302, AND MW-304, WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM NOVEMBER 11-12, 2015.
 2. MONITORING WELLS MW-303 AND MW-305 WERE INSTALLED BY CASCADE DRILLING LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 7-8, 2015.
 3. MONITORING WELLS MW-301, MW-302, MW-304 AND MW-306 WERE SURVEYED BY FRENCH RENEKER ASSOCIATES, INC. ON DECEMBER 3, 2015.
 4. MONITORING WELLS MW-303 AND MW-305 WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES, INC. ON FEBRUARY 11, 2016.
 5. MONITORING WELLS MW-307, MW-308, AND MW-309 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM OCTOBER 25-27, 2016.
 6. MONITORING WELLS MW-307, MW-308, AND MW-309 WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES, INC. ON JANUARY 18, 2017



PROJECT NO. 25219072.00	DRAWN BY: LEC/BSS	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 15300 130th STREET OTTUMWA, IA 52501	SITE OTTUMWA GENERATING STATION 20775 POWER PLANT ROAD OTTUMWA, IOWA	MONITORING WELL LOCATIONS MAP	FIGURE
DRAWN: 05/29/15	CHECKED BY: JR					2
REVISED: 06/18/19	APPROVED BY:					

I:\25219072.00\Drawings\2_Site Plan and Monitoring Wells.dwg, 6/18/2019 9:38:32 AM



Appendix A
Analytical Laboratory Reports

A1 Round 1 Background Sampling, Analytical Laboratory Report

February 02, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60236558

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on January 24, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60236558001	MW-301	Water	01/18/17 11:55	01/24/17 08:40
60236558002	MW-302	Water	01/18/17 13:05	01/24/17 08:40
60236558003	MW-303	Water	01/18/17 14:15	01/24/17 08:40
60236558004	MW-304	Water	01/18/17 15:15	01/24/17 08:40
60236558005	MW-305	Water	01/18/17 16:20	01/24/17 08:40
60236558006	MW-306	Water	01/18/17 17:10	01/24/17 08:40
60236558007	FIELD BLANK	Water	01/19/17 13:15	01/24/17 08:40
60236558008	MW-307	Water	01/19/17 10:55	01/24/17 08:40
60236558009	MW-308	Water	01/19/17 11:45	01/24/17 08:40
60236558010	MW-309	Water	01/19/17 13:30	01/24/17 08:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60236558001	MW-301	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558002	MW-302	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558003	MW-303	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558004	MW-304	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558005	MW-305	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558006	MW-306	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558007	FIELD BLANK	EPA 6010	ZBM	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60236558008	MW-307	EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236558009	MW-308	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
60236558010	MW-309	EPA 9056	OL	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-301 Lab ID: 60236558001 Collected: 01/18/17 11:55 Received: 01/24/17 08:40 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 09:40		
Field pH	6.47	Std. Units	0.10	0.050	1		02/01/17 09:40		
Field Temperature	6.8	deg C	0.50	0.25	1		02/01/17 09:40		
Field Specific Conductance	834	umhos/cm	1.0	1.0	1		02/01/17 09:40		
Oxygen, Dissolved	487	mg/L			1		02/01/17 09:40	7782-44-7	
REDOX	30.2	mV			1		02/01/17 09:40		
Turbidity	0.60	NTU	1.0	1.0	1		02/01/17 09:40		
Groundwater Elevation	681.67	feet			1		02/01/17 09:40		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	599	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:30	7440-42-8	
Calcium	74.1	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:30	7440-70-2	
Lithium	20.1	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:30	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.11J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 13:43	7440-36-0	B
Arsenic	0.23J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 13:43	7440-38-2	
Barium	42.4	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 13:43	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 13:43	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 13:43	7440-43-9	
Chromium	0.59J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 13:43	7440-47-3	
Cobalt	1.3	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 13:43	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 13:43	7439-92-1	
Molybdenum	0.76J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 13:43	7439-98-7	
Selenium	5.9	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 13:43	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 13:43	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:23	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	545	mg/L	5.0	5.0	1		01/25/17 15:06		
9040 pH Analytical Method: EPA 9040									
pH	6.8	Std. Units	0.10	0.10	1		02/01/17 12:42		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	71.6	mg/L	10.0	5.0	10		01/31/17 13:04	16887-00-6	
Fluoride	0.17J	mg/L	0.20	0.027	1		01/29/17 10:52	16984-48-8	
Sulfate	171	mg/L	10.0	1.5	10		01/31/17 13:04	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-302 Lab ID: 60236558002 Collected: 01/18/17 13:05 Received: 01/24/17 08:40 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 09:46		
Field pH	6.62	Std. Units	0.10	0.050	1		02/01/17 09:46		
Field Temperature	12.9	deg C	0.50	0.25	1		02/01/17 09:46		
Field Specific Conductance	2247	umhos/cm	1.0	1.0	1		02/01/17 09:46		
Oxygen, Dissolved	0.18	mg/L			1		02/01/17 09:46	7782-44-7	
REDOX	38.7	mV			1		02/01/17 09:46		
Turbidity	3.11	NTU	1.0	1.0	1		02/01/17 09:46		
Groundwater Elevation	655.46	feet			1		02/01/17 09:46		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1250	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:37	7440-42-8	
Calcium	188	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:37	7440-70-2	
Lithium	9.7J	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:37	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.11J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 13:56	7440-36-0	B
Arsenic	0.23J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 13:56	7440-38-2	
Barium	20.4	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 13:56	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 13:56	7440-41-7	
Cadmium	0.15J	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 13:56	7440-43-9	
Chromium	0.58J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 13:56	7440-47-3	
Cobalt	0.94J	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 13:56	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 13:56	7439-92-1	
Molybdenum	0.50J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 13:56	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 13:56	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 13:56	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:30	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1660	mg/L	5.0	5.0	1		01/25/17 15:07		
9040 pH Analytical Method: EPA 9040									
pH	6.8	Std. Units	0.10	0.10	1		02/01/17 12:43		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	259	mg/L	20.0	10.0	20		01/31/17 15:07	16887-00-6	
Fluoride	0.21	mg/L	0.20	0.027	1		01/29/17 11:33	16984-48-8	
Sulfate	777	mg/L	100	15.4	100		01/31/17 15:38	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-303 Lab ID: 60236558003 Collected: 01/18/17 14:15 Received: 01/24/17 08:40 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 09:47		
Field pH	6.77	Std. Units	0.10	0.050	1		02/01/17 09:47		
Field Temperature	10.6	deg C	0.50	0.25	1		02/01/17 09:47		
Field Specific Conductance	1611	umhos/cm	1.0	1.0	1		02/01/17 09:47		
Oxygen, Dissolved	0.17	mg/L			1		02/01/17 09:47	7782-44-7	
REDOX	21.3	mV			1		02/01/17 09:47		
Turbidity	3.3	NTU	1.0	1.0	1		02/01/17 09:47		
Groundwater Elevation	651.74	feet			1		02/01/17 09:47		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	738	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:39	7440-42-8	
Calcium	173	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:39	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:39	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.19J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:00	7440-36-0	B
Arsenic	0.54J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:00	7440-38-2	
Barium	75.3	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:00	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:00	7440-41-7	
Cadmium	0.31J	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:00	7440-43-9	
Chromium	0.52J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:00	7440-47-3	
Cobalt	2.6	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:00	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:00	7439-92-1	
Molybdenum	0.64J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:00	7439-98-7	
Selenium	0.80J	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:00	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:00	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:32	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1030	mg/L	5.0	5.0	1		01/25/17 15:07		
9040 pH Analytical Method: EPA 9040									
pH	7.1	Std. Units	0.10	0.10	1		02/01/17 12:45		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	190	mg/L	20.0	10.0	20		01/31/17 16:08	16887-00-6	
Fluoride	0.21	mg/L	0.20	0.027	1		01/29/17 12:28	16984-48-8	
Sulfate	168	mg/L	20.0	3.1	20		01/31/17 16:08	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-304 **Lab ID: 60236558004** Collected: 01/18/17 15:15 Received: 01/24/17 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 09:48		
Field pH	7.05	Std. Units	0.10	0.050	1		02/01/17 09:48		
Field Temperature	12.9	deg C	0.50	0.25	1		02/01/17 09:48		
Field Specific Conductance	2052	umhos/cm	1.0	1.0	1		02/01/17 09:48		
Oxygen, Dissolved	0.16	mg/L			1		02/01/17 09:48	7782-44-7	
REDOX	-79.3	mV			1		02/01/17 09:48		
Turbidity	1.17	NTU	1.0	1.0	1		02/01/17 09:48		
Groundwater Elevation	654.50	feet			1		02/01/17 09:48		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	995	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:41	7440-42-8	
Calcium	122	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:41	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:41	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.10J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:04	7440-36-0	B
Arsenic	0.82J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:04	7440-38-2	
Barium	92.4	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:04	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:04	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:04	7440-43-9	
Chromium	0.69J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:04	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:04	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:04	7439-92-1	
Molybdenum	1.5	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:04	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:04	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:04	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:34	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1230	mg/L	5.0	5.0	1		01/25/17 15:08		
9040 pH Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		02/01/17 12:47		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	383	mg/L	20.0	10.0	20		01/31/17 16:24	16887-00-6	
Fluoride	0.82	mg/L	0.20	0.027	1		01/29/17 12:41	16984-48-8	
Sulfate	204	mg/L	20.0	3.1	20		01/31/17 16:24	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-305		Lab ID: 60236558005		Collected: 01/18/17 16:20		Received: 01/24/17 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		02/01/17 09:59		
Field pH	6.96	Std. Units	0.10	0.050	1		02/01/17 09:59		
Field Temperature	12.8	deg C	0.50	0.25	1		02/01/17 09:59		
Field Specific Conductance	1794	umhos/cm	1.0	1.0	1		02/01/17 09:59		
Oxygen, Dissolved	0.09	mg/L			1		02/01/17 09:59	7782-44-7	
REDOX	24.2	mV			1		02/01/17 09:59		
Turbidity	0.5	NTU	1.0	1.0	1		02/01/17 09:59		
Groundwater Elevation	660.87	feet			1		02/01/17 09:59		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	956	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:43	7440-42-8	
Calcium	98.5	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:43	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:43	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.18J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:08	7440-36-0	B
Arsenic	0.57J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:08	7440-38-2	
Barium	117	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:08	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:08	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:08	7440-43-9	
Chromium	ND	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:08	7440-47-3	
Cobalt	15.2	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:08	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:08	7439-92-1	
Molybdenum	5.9	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:08	7439-98-7	
Selenium	0.34J	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:08	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:08	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:37	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1020	mg/L	5.0	5.0	1		01/25/17 15:08		
9040 pH		Analytical Method: EPA 9040							
pH	7.3	Std. Units	0.10	0.10	1		02/01/17 12:48		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	289	mg/L	20.0	10.0	20		01/31/17 17:10	16887-00-6	
Fluoride	0.35	mg/L	0.20	0.027	1		01/29/17 12:55	16984-48-8	
Sulfate	90.0	mg/L	10.0	1.5	10		01/31/17 16:55	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-306 Lab ID: 60236558006 Collected: 01/18/17 17:10 Received: 01/24/17 08:40 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 10:00		
Field pH	6.51	Std. Units	0.10	0.050	1		02/01/17 10:00		
Field Temperature	13.6	deg C	0.50	0.25	1		02/01/17 10:00		
Field Specific Conductance	1215	umhos/cm	1.0	1.0	1		02/01/17 10:00		
Oxygen, Dissolved	0.13	mg/L			1		02/01/17 10:00	7782-44-7	
REDOX	44.2	mV			1		02/01/17 10:00		
Turbidity	0.49	NTU	1.0	1.0	1		02/01/17 10:00		
Groundwater Elevation	669.89	feet			1		02/01/17 10:00		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	809	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:46	7440-42-8	
Calcium	85.9	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:46	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:46	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.18J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:13	7440-36-0	B
Arsenic	0.47J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:13	7440-38-2	
Barium	56.4	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:13	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:13	7440-41-7	
Cadmium	0.74	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:13	7440-43-9	
Chromium	0.68J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:13	7440-47-3	
Cobalt	6.0	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:13	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:13	7439-92-1	
Molybdenum	4.7	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:13	7439-98-7	
Selenium	0.20J	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:13	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:13	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:39	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	828	mg/L	5.0	5.0	1		01/25/17 15:09		
9040 pH Analytical Method: EPA 9040									
pH	6.9	Std. Units	0.10	0.10	1		02/01/17 12:50		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	57.2	mg/L	5.0	2.5	5		01/31/17 17:56	16887-00-6	
Fluoride	0.087J	mg/L	0.20	0.027	1		01/29/17 13:09	16984-48-8	
Sulfate	285	mg/L	20.0	3.1	20		01/31/17 18:12	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: FIELD BLANK									
Lab ID: 60236558007									
Collected: 01/19/17 13:15									
Received: 01/24/17 08:40									
Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	ND	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:52	7440-42-8	
Calcium	0.012J	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:52	7440-70-2	B
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:52	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.078J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:26	7440-36-0	B
Arsenic	ND	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:26	7440-38-2	
Barium	ND	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:26	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:26	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:26	7440-43-9	
Chromium	0.44J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:26	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:26	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:26	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:26	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:26	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:26	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:41	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		01/25/17 15:14		
9040 pH									
Analytical Method: EPA 9040									
pH	5.5	Std. Units	0.10	0.10	1		02/01/17 12:55		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	ND	mg/L	1.0	0.50	1		01/31/17 18:27	16887-00-6	
Fluoride	ND	mg/L	0.20	0.027	1		01/31/17 18:27	16984-48-8	
Sulfate	ND	mg/L	1.0	0.15	1		01/31/17 18:27	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-307		Lab ID: 60236558008		Collected: 01/19/17 10:55		Received: 01/24/17 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		02/01/17 10:00		
Field pH	6.70	Std. Units	0.10	0.050	1		02/01/17 10:00		
Field Temperature	12.9	deg C	0.50	0.25	1		02/01/17 10:00		
Field Specific Conductance	1640	umhos/cm	1.0	1.0	1		02/01/17 10:00		
Oxygen, Dissolved	0.16	mg/L			1		02/01/17 10:00	7782-44-7	
REDOX	-42.0	mV			1		02/01/17 10:00		
Turbidity	9.01	NTU	1.0	1.0	1		02/01/17 10:00		
Groundwater Elevation	648.81	feet			1		02/01/17 10:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	207	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:54	7440-42-8	
Calcium	230	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:54	7440-70-2	
Lithium	10.0	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:54	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.10J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:34	7440-36-0	B
Arsenic	1.1	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:34	7440-38-2	
Barium	127	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:34	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:34	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:34	7440-43-9	
Chromium	0.59J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:34	7440-47-3	
Cobalt	0.62J	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:34	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:34	7439-92-1	
Molybdenum	0.50J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:34	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:34	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:34	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:43	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1050	mg/L	5.0	5.0	1		01/25/17 15:15		
9040 pH		Analytical Method: EPA 9040							
pH	7.0	Std. Units	0.10	0.10	1		02/01/17 12:51		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	210	mg/L	20.0	10.0	20		01/31/17 18:58	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.027	1		01/29/17 13:36	16984-48-8	
Sulfate	105	mg/L	10.0	1.5	10		01/31/17 18:42	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-308 Lab ID: 60236558009 Collected: 01/19/17 11:45 Received: 01/24/17 08:40 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		02/01/17 10:01		
Field pH	6.85	Std. Units	0.10	0.050	1		02/01/17 10:01		
Field Temperature	12.6	deg C	0.50	0.25	1		02/01/17 10:01		
Field Specific Conductance	1559	umhos/cm	1.0	1.0	1		02/01/17 10:01		
Oxygen, Dissolved	0.15	mg/L			1		02/01/17 10:01	7782-44-7	
REDOX	-44.4	mV			1		02/01/17 10:01		
Turbidity	1.65	NTU	1.0	1.0	1		02/01/17 10:01		
Groundwater Elevation	647.42	feet			1		02/01/17 10:01		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	218	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:57	7440-42-8	
Calcium	212	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:57	7440-70-2	
Lithium	10.3	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:57	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.11J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:39	7440-36-0	B
Arsenic	0.44J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:39	7440-38-2	
Barium	118	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:39	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:39	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:39	7440-43-9	
Chromium	0.57J	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:39	7440-47-3	
Cobalt	0.52J	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:39	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:39	7439-92-1	
Molybdenum	0.95J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:39	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:39	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:39	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:50	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1060	mg/L	5.0	5.0	1		01/25/17 15:16		
9040 pH Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		02/01/17 12:52		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	151	mg/L	10.0	5.0	10		01/31/17 19:13	16887-00-6	
Fluoride	0.11J	mg/L	0.20	0.027	1		01/29/17 13:50	16984-48-8	
Sulfate	296	mg/L	50.0	7.7	50		01/31/17 19:29	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Sample: MW-309		Lab ID: 60236558010		Collected: 01/19/17 13:30		Received: 01/24/17 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	Client				1		02/01/17 10:02		
Field pH	7.18	Std. Units	0.10	0.050	1		02/01/17 10:02		
Field Temperature	12.7	deg C	0.50	0.25	1		02/01/17 10:02		
Field Specific Conductance	1426	umhos/cm	1.0	1.0	1		02/01/17 10:02		
Oxygen, Dissolved	0.09	mg/L			1		02/01/17 10:02	7782-44-7	
REDOX	-42.1	mV			1		02/01/17 10:02		
Turbidity	8.56	NTU	1.0	1.0	1		02/01/17 10:02		
Groundwater Elevation	646.66	feet			1		02/01/17 10:02		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1300	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 12:59	7440-42-8	
Calcium	134	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 12:59	7440-70-2	
Lithium	5.8J	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 12:59	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.095J	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:43	7440-36-0	B
Arsenic	0.66J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:43	7440-38-2	
Barium	48.7	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:43	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:43	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:43	7440-43-9	
Chromium	1.4	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:43	7440-47-3	
Cobalt	2.0	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:43	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:43	7439-92-1	
Molybdenum	0.57J	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:43	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:43	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:43	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.039	1	02/01/17 08:35	02/01/17 14:52	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1030	mg/L	5.0	5.0	1		01/25/17 15:16		
9040 pH									
Analytical Method: EPA 9040									
pH	7.4	Std. Units	0.10	0.10	1		02/01/17 12:56		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	73.1	mg/L	10.0	5.0	10		01/31/17 19:44	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.027	1		01/29/17 14:03	16984-48-8	
Sulfate	406	mg/L	50.0	7.7	50		01/31/17 19:59	14808-79-8	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch: 463894 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010

METHOD BLANK: 1898803 Matrix: Water
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.039	02/01/17 14:14	

LABORATORY CONTROL SAMPLE: 1898804

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1898805 1898806

Parameter	Units	60236558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	5.4	5.6	108	112	75-125	3	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch:	463142	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3010	Analysis Description:	6010 MET
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

METHOD BLANK:	1896141	Matrix:	Water
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	50.0	01/26/17 12:28	
Calcium	mg/L	0.016J	0.10	0.0081	01/26/17 12:28	
Lithium	ug/L	ND	10.0	4.9	01/26/17 12:28	

LABORATORY CONTROL SAMPLE: 1896142						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1020	102	80-120	
Calcium	mg/L	10	10.5	105	80-120	
Lithium	ug/L	1000	1130	113	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1896143												1896144	
Parameter	Units	60236558001		MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.									
Boron	ug/L	599	1000	1000	1620	1580	102	98	75-125	2	20		
Calcium	mg/L	74.1	10	10	83.4	82.4	92	82	75-125	1	20		
Lithium	ug/L	20.1	1000	1000	1110	1070	109	105	75-125	4	20		

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch:	463143	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3010	Analysis Description:	6020 MET
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

METHOD BLANK:	1896145	Matrix:	Water
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.075J	1.0	0.058	01/30/17 13:34	
Arsenic	ug/L	ND	1.0	0.10	01/30/17 13:34	
Barium	ug/L	ND	1.0	0.14	01/30/17 13:34	
Beryllium	ug/L	ND	0.50	0.080	01/30/17 13:34	
Cadmium	ug/L	ND	0.50	0.029	01/30/17 13:34	
Chromium	ug/L	ND	1.0	0.34	01/30/17 13:34	
Cobalt	ug/L	ND	1.0	0.50	01/30/17 13:34	
Lead	ug/L	ND	1.0	0.19	01/30/17 13:34	
Molybdenum	ug/L	ND	1.0	0.10	01/30/17 13:34	
Selenium	ug/L	ND	1.0	0.18	01/30/17 13:34	
Thallium	ug/L	ND	1.0	0.50	01/30/17 13:34	

LABORATORY CONTROL SAMPLE: 1896146

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.3	101	80-120	
Arsenic	ug/L	40	41.4	104	80-120	
Barium	ug/L	40	39.9	100	80-120	
Beryllium	ug/L	40	39.8	100	80-120	
Cadmium	ug/L	40	40.7	102	80-120	
Chromium	ug/L	40	41.3	103	80-120	
Cobalt	ug/L	40	40.8	102	80-120	
Lead	ug/L	40	39.2	98	80-120	
Molybdenum	ug/L	40	41.5	104	80-120	
Selenium	ug/L	40	40.3	101	80-120	
Thallium	ug/L	40	40.8	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1896147 1896148

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Antimony	ug/L	0.11J	40	40	39.3	40.2	98	100	75-125	2	20
Arsenic	ug/L	0.23J	40	40	40.0	40.6	99	101	75-125	2	20
Barium	ug/L	42.4	40	40	80.7	83.3	96	102	75-125	3	20
Beryllium	ug/L	ND	40	40	37.7	37.6	94	94	75-125	0	20
Cadmium	ug/L	ND	40	40	38.2	38.8	96	97	75-125	1	20
Chromium	ug/L	0.59J	40	40	40.2	41.0	99	101	75-125	2	20

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Parameter	Units	1896147		1896148		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60236558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Cobalt	ug/L	1.3	40	40	39.6	39.7	96	96	75-125	0	20		
Lead	ug/L	ND	40	40	36.3	36.7	91	92	75-125	1	20		
Molybdenum	ug/L	0.76J	40	40	42.2	42.0	104	103	75-125	1	20		
Selenium	ug/L	5.9	40	40	43.6	44.1	94	96	75-125	1	20		
Thallium	ug/L	ND	40	40	38.6	38.7	96	96	75-125	0	20		

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch:	463213	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

METHOD BLANK: 1896349 Matrix: Water
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	01/25/17 15:02	

LABORATORY CONTROL SAMPLE: 1896350

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	972	97	80-120	

SAMPLE DUPLICATE: 1896351

Parameter	Units	60236433001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	324	322	1	10	

SAMPLE DUPLICATE: 1896352

Parameter	Units	60236559005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	14100	14500	2	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch:	464025	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
Associated Lab Samples:	60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010		

SAMPLE DUPLICATE: 1899241

Parameter	Units	60236559002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.6	7.6	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch: 463615 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558008, 60236558009, 60236558010

METHOD BLANK: 1898028 Matrix: Water
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558008, 60236558009, 60236558010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.20	0.027	01/29/17 10:25	

LABORATORY CONTROL SAMPLE: 1898029

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1898030 1898031

Parameter	Units	60236558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.17J	2.5	2.5	2.8	2.9	107	111	80-120	4	15	

SAMPLE DUPLICATE: 1898032

Parameter	Units	60236558002 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	mg/L	0.21	0.22	6	15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

QC Batch: 463899 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010

METHOD BLANK: 1898811 Matrix: Water
 Associated Lab Samples: 60236558001, 60236558002, 60236558003, 60236558004, 60236558005, 60236558006, 60236558007, 60236558008, 60236558009, 60236558010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	01/31/17 10:25	
Fluoride	mg/L	ND	0.20	0.027	01/31/17 10:25	
Sulfate	mg/L	ND	1.0	0.15	01/31/17 10:25	

LABORATORY CONTROL SAMPLE: 1898812

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	80-120	
Fluoride	mg/L	2.5	2.6	104	80-120	
Sulfate	mg/L	5	5.0	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1898813 1898814

Parameter	Units	60236558001		60236558002		MSD		MS		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	71.6	50	50	127	126	111	109	80-120	1	15		

SAMPLE DUPLICATE: 1898815

Parameter	Units	60236558002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	259	253	3	15	
Sulfate	mg/L	777	775	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236558001	MW-301		464023		
60236558002	MW-302		464023		
60236558003	MW-303		464023		
60236558004	MW-304		464023		
60236558005	MW-305		464023		
60236558006	MW-306		464023		
60236558008	MW-307		464023		
60236558009	MW-308		464023		
60236558010	MW-309		464023		
60236558001	MW-301	EPA 3010	463142	EPA 6010	463178
60236558002	MW-302	EPA 3010	463142	EPA 6010	463178
60236558003	MW-303	EPA 3010	463142	EPA 6010	463178
60236558004	MW-304	EPA 3010	463142	EPA 6010	463178
60236558005	MW-305	EPA 3010	463142	EPA 6010	463178
60236558006	MW-306	EPA 3010	463142	EPA 6010	463178
60236558007	FIELD BLANK	EPA 3010	463142	EPA 6010	463178
60236558008	MW-307	EPA 3010	463142	EPA 6010	463178
60236558009	MW-308	EPA 3010	463142	EPA 6010	463178
60236558010	MW-309	EPA 3010	463142	EPA 6010	463178
60236558001	MW-301	EPA 3010	463143	EPA 6020	463177
60236558002	MW-302	EPA 3010	463143	EPA 6020	463177
60236558003	MW-303	EPA 3010	463143	EPA 6020	463177
60236558004	MW-304	EPA 3010	463143	EPA 6020	463177
60236558005	MW-305	EPA 3010	463143	EPA 6020	463177
60236558006	MW-306	EPA 3010	463143	EPA 6020	463177
60236558007	FIELD BLANK	EPA 3010	463143	EPA 6020	463177
60236558008	MW-307	EPA 3010	463143	EPA 6020	463177
60236558009	MW-308	EPA 3010	463143	EPA 6020	463177
60236558010	MW-309	EPA 3010	463143	EPA 6020	463177
60236558001	MW-301	EPA 7470	463894	EPA 7470	464001
60236558002	MW-302	EPA 7470	463894	EPA 7470	464001
60236558003	MW-303	EPA 7470	463894	EPA 7470	464001
60236558004	MW-304	EPA 7470	463894	EPA 7470	464001
60236558005	MW-305	EPA 7470	463894	EPA 7470	464001
60236558006	MW-306	EPA 7470	463894	EPA 7470	464001
60236558007	FIELD BLANK	EPA 7470	463894	EPA 7470	464001
60236558008	MW-307	EPA 7470	463894	EPA 7470	464001
60236558009	MW-308	EPA 7470	463894	EPA 7470	464001
60236558010	MW-309	EPA 7470	463894	EPA 7470	464001
60236558001	MW-301	SM 2540C	463213		
60236558002	MW-302	SM 2540C	463213		
60236558003	MW-303	SM 2540C	463213		
60236558004	MW-304	SM 2540C	463213		
60236558005	MW-305	SM 2540C	463213		
60236558006	MW-306	SM 2540C	463213		
60236558007	FIELD BLANK	SM 2540C	463213		
60236558008	MW-307	SM 2540C	463213		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236558

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236558009	MW-308	SM 2540C	463213		
60236558010	MW-309	SM 2540C	463213		
60236558001	MW-301	EPA 9040	464025		
60236558002	MW-302	EPA 9040	464025		
60236558003	MW-303	EPA 9040	464025		
60236558004	MW-304	EPA 9040	464025		
60236558005	MW-305	EPA 9040	464025		
60236558006	MW-306	EPA 9040	464025		
60236558007	FIELD BLANK	EPA 9040	464025		
60236558008	MW-307	EPA 9040	464025		
60236558009	MW-308	EPA 9040	464025		
60236558010	MW-309	EPA 9040	464025		
60236558001	MW-301	EPA 9056	463615		
60236558001	MW-301	EPA 9056	463899		
60236558002	MW-302	EPA 9056	463615		
60236558002	MW-302	EPA 9056	463899		
60236558003	MW-303	EPA 9056	463615		
60236558003	MW-303	EPA 9056	463899		
60236558004	MW-304	EPA 9056	463615		
60236558004	MW-304	EPA 9056	463899		
60236558005	MW-305	EPA 9056	463615		
60236558005	MW-305	EPA 9056	463899		
60236558006	MW-306	EPA 9056	463615		
60236558006	MW-306	EPA 9056	463899		
60236558007	FIELD BLANK	EPA 9056	463899		
60236558008	MW-307	EPA 9056	463615		
60236558008	MW-307	EPA 9056	463899		
60236558009	MW-308	EPA 9056	463615		
60236558009	MW-308	EPA 9056	463899		
60236558010	MW-309	EPA 9056	463615		
60236558010	MW-309	EPA 9056	463899		

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Sample Condition Upon Receipt

WO#: 60236558



60236558

Client Name: SCS

Courier: FedEx [x] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 8102 8915 9891 Pace Shipping Label Used? Yes [] No []

Custody Seal on Cooler/Box Present: Yes [x] No [] Seals intact: Yes [x] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [x] Other []

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.5 Corr. Factor CF +1.5 DF +0.9 Corrected 2.0

Date and initials of person examining contents: 1/24

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., pH, WT).

Client Notification/ Resolution: Copy COC to Client? Y / [x] Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 1-24-17



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:
 Company: SCS Engineers
 Address: 2830 Dairy Drive
 Madison WI 53718
 Email To: mbloodgett@scsengineers.com
 Phone: 608-216-7362 Fax: _____
 Requested Due Date/TAT: _____

Section B Required Project Information:
 Report To: Meghan Bloodgett
 Copy To: Tom Karwaski
 Purchase Order No.: _____
 Project Name: Ottumwa Generating Station
 Project Number: 25216072

Section C Invoice Information:
 Attention: Meghan Bloodgett/Jess Valcheff
 Company Name: SCS Engineers
 Address: _____
 Pace Quote Reference: _____
 Pace Project Manager: Trudy Gipson 913-563-1405
 Pace Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER _____

Site Location: IA
 STATE: _____

ITEM #	Classification	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOIL/SOLID OIL WIPE AIR OTHER TISSUE	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Requested Analysis Filtered (Y/N)	Temp In °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
			DATE	TIME									
1	Internal	MW-301	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
2	Internal	MW-302	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
3	Internal	MW-303	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
4	Internal	MW-304	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
5	Internal	MW-305	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
6	Internal	MW-306	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
7	FCRM	FIELD BLANK	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
8	67001	MW-307	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
9	67001	MW-308	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
10	67001	MW-309	WT	G	WT G	2	1	1	Y	114	0940	Y	Y
11	83												
12													

ADDITIONAL COMMENTS
 Ship To: 9606 Loiret Boulevard, Lenexa, KS 66219
 * Sb-As-Ba-Bi-Cd-Cr-Cu-Pb-Mo-Se-Tl

RELINQUISHED BY / AFFILIATION
 DATE: 1-23-17 TIME: 16:30
 SIGNATURE: Paul A. Grover

ACCEPTED BY / AFFILIATION
 DATE: 1/14/17 TIME: 0940
 SIGNATURE: [Signature]

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Paul A. Grover
 SIGNATURE of SAMPLER: [Signature]
 DATE Signed (MM/DD/YYYY): 1-20-17

February 15, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60236563

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on January 24, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60236563001	MW-301	Water	01/18/17 11:55	01/24/17 08:40
60236563002	MW-302	Water	01/18/17 13:05	01/24/17 08:40
60236563003	MW-303	Water	01/18/17 14:15	01/24/17 08:40
60236563004	MW-304	Water	01/18/17 15:15	01/24/17 08:40
60236563005	MW-305	Water	01/18/17 16:20	01/24/17 08:40
60236563006	MW-306	Water	01/18/17 17:10	01/24/17 08:40
60236563007	FIELD BLANK	Water	01/19/17 13:15	01/24/17 08:40
60236563008	MW-307	Water	01/19/17 10:55	01/24/17 08:40
60236563009	MW-308	Water	01/19/17 11:45	01/24/17 08:40
60236563010	MW-309	Water	01/19/17 13:30	01/24/17 08:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60236563001	MW-301	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563002	MW-302	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563003	MW-303	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563004	MW-304	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563005	MW-305	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563006	MW-306	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563007	FIELD BLANK	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563008	MW-307	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563009	MW-308	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236563010	MW-309	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-301 **Lab ID: 60236563001** Collected: 01/18/17 11:55 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.143 ± 0.396 (0.768) C:NA T:86%	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	-0.403 ± 0.454 (1.13) C:63% T:88%	pCi/L	02/14/17 13:15	15262-20-1	
Total Radium	Total Radium Calculation	0.143 ± 0.850 (1.90)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-302 **Lab ID: 60236563002** Collected: 01/18/17 13:05 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.136 ± 0.328 (0.633) C:NA T:93%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	-0.0781 ± 0.896 (2.11) C:34% T:82%	pCi/L	02/14/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	0.136 ± 1.22 (2.74)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-303 **Lab ID: 60236563003** Collected: 01/18/17 14:15 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.145 ± 0.449 (0.870) C:NA T:83%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	0.660 ± 0.422 (0.781) C:94% T:75%	pCi/L	02/14/17 14:46	15262-20-1	
Total Radium	Total Radium Calculation	0.805 ± 0.871 (1.65)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-304 **Lab ID: 60236563004** Collected: 01/18/17 15:15 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.33 ± 0.667 (0.545) C:NA T:86%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	1.61 ± 0.589 (0.853) C:73% T:74%	pCi/L	02/14/17 12:06	15262-20-1	
Total Radium	Total Radium Calculation	2.94 ± 1.26 (1.40)	pCi/L	02/15/17 14:04	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-305 **Lab ID: 60236563005** Collected: 01/18/17 16:20 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.162 ± 0.448 (0.869) C:NA T:79%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	1.30 ± 0.511 (0.750) C:66% T:81%	pCi/L	02/14/17 12:06	15262-20-1	
Total Radium	Total Radium Calculation	1.46 ± 0.959 (1.62)	pCi/L	02/15/17 14:04	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-306 **Lab ID: 60236563006** Collected: 01/18/17 17:10 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.150 ± 0.360 (0.899) C:NA T:85%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	0.435 ± 0.255 (0.463) C:111% T:84%	pCi/L	02/14/17 12:07	15262-20-1	
Total Radium	Total Radium Calculation	0.435 ± 0.615 (1.36)	pCi/L	02/15/17 14:04	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: FIELD BLANK **Lab ID: 60236563007** Collected: 01/19/17 13:15 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.074 ± 0.384 (0.889) C:NA T:83%	pCi/L	02/14/17 21:23	13982-63-3	
Radium-228	EPA 904.0	0.576 ± 0.808 (1.73) C:34% T:76%	pCi/L	02/14/17 12:07	15262-20-1	
Total Radium	Total Radium Calculation	0.576 ± 1.19 (2.62)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-307 **Lab ID: 60236563008** Collected: 01/19/17 10:55 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.55 ± 0.751 (0.757) C:NA T:86%	pCi/L	02/14/17 21:52	13982-63-3	
Radium-228	EPA 904.0	1.11 ± 0.484 (0.772) C:71% T:79%	pCi/L	02/14/17 12:07	15262-20-1	
Total Radium	Total Radium Calculation	2.66 ± 1.24 (1.53)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-308 **Lab ID: 60236563009** Collected: 01/19/17 11:45 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.282 ± 0.438 (0.759) C:NA T:87%	pCi/L	02/14/17 21:52	13982-63-3	
Radium-228	EPA 904.0	1.17 ± 0.448 (0.628) C:73% T:81%	pCi/L	02/14/17 12:07	15262-20-1	
Total Radium	Total Radium Calculation	1.45 ± 0.886 (1.39)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Sample: MW-309 **Lab ID: 60236563010** Collected: 01/19/17 13:30 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.143 ± 0.327 (0.526) C:NA T:86%	pCi/L	02/14/17 21:52	13982-63-3	
Radium-228	EPA 904.0	0.463 ± 0.371 (0.733) C:78% T:78%	pCi/L	02/14/17 12:07	15262-20-1	
Total Radium	Total Radium Calculation	0.606 ± 0.698 (1.26)	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

QC Batch:	248442	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60236563001, 60236563002, 60236563003, 60236563004, 60236563005, 60236563006, 60236563007, 60236563008, 60236563009, 60236563010		

METHOD BLANK:	1222155	Matrix:	Water
Associated Lab Samples:	60236563001, 60236563002, 60236563003, 60236563004, 60236563005, 60236563006, 60236563007, 60236563008, 60236563009, 60236563010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.351 ± 0.497 (0.843) C:NA T:90%	pCi/L	02/14/17 20:21	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

QC Batch:	248443	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60236563001, 60236563002, 60236563003, 60236563004, 60236563005, 60236563006, 60236563007, 60236563008, 60236563009, 60236563010		

METHOD BLANK:	1222156	Matrix:	Water
Associated Lab Samples:	60236563001, 60236563002, 60236563003, 60236563004, 60236563005, 60236563006, 60236563007, 60236563008, 60236563009, 60236563010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.181 ± 0.313 (0.784) C:62% T:85%	pCi/L	02/14/17 11:56	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60236563

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236563001	MW-301	EPA 903.1	248442		
60236563002	MW-302	EPA 903.1	248442		
60236563003	MW-303	EPA 903.1	248442		
60236563004	MW-304	EPA 903.1	248442		
60236563005	MW-305	EPA 903.1	248442		
60236563006	MW-306	EPA 903.1	248442		
60236563007	FIELD BLANK	EPA 903.1	248442		
60236563008	MW-307	EPA 903.1	248442		
60236563009	MW-308	EPA 903.1	248442		
60236563010	MW-309	EPA 903.1	248442		
60236563001	MW-301	EPA 904.0	248443		
60236563002	MW-302	EPA 904.0	248443		
60236563003	MW-303	EPA 904.0	248443		
60236563004	MW-304	EPA 904.0	248443		
60236563005	MW-305	EPA 904.0	248443		
60236563006	MW-306	EPA 904.0	248443		
60236563007	FIELD BLANK	EPA 904.0	248443		
60236563008	MW-307	EPA 904.0	248443		
60236563009	MW-308	EPA 904.0	248443		
60236563010	MW-309	EPA 904.0	248443		
60236563001	MW-301	Total Radium Calculation	249404		
60236563002	MW-302	Total Radium Calculation	249404		
60236563003	MW-303	Total Radium Calculation	249404		
60236563004	MW-304	Total Radium Calculation	249404		
60236563005	MW-305	Total Radium Calculation	249404		
60236563006	MW-306	Total Radium Calculation	249404		
60236563007	FIELD BLANK	Total Radium Calculation	249404		
60236563008	MW-307	Total Radium Calculation	249404		
60236563009	MW-308	Total Radium Calculation	249404		
60236563010	MW-309	Total Radium Calculation	249404		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60236563



Client Name: SCS Eng

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 9102 8965 9891 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: CF +1.5 T-266 CF +0.9 T-239 Type of Ice: Water Blue None

Cooler Temperature (°C): As-read 3.7 Corr. Factor CF +1.5 CF +0.9 Corrected 5.270

Date and initials of person examining contents: 9/5/17 JES

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>water</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: JES Date: 2-24-17



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: SCS Engineers	Report To: Meghan Blodgett	Company Name: SCS Engineers	Attention: Meghan Blodgett/Jess Valcheff	Company Name: SCS Engineers	REGULATORY AGENCY
Address: 2830 Dairy Drive	Copy To: Tom Karwaski	Address:		Address:	<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER
Madison WI 53718	Purchase Order No.:	Face Quote Reference:		Face Quote Reference:	<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER
Email To: mblodgett@scsengineers.com	Project Name: Ottumwa Generating Station	Face Project Manager:	Trudy Gipson 913-563-1405	Face Project Manager:	Site Location
Phone: 608-216-7362	Project Number: 25216072	Face Profile #:	6696 Line 2	Face Profile #:	STATE: IA
Requested Due Date/TAT:					

ITEM #	Valid Matrix Codes MATRIX DRINKING WATER DW WATER WW WASTE WATER P PRODUCT P SOIL/SOLID OIL WIPE AIR OTHER TISSUE TS	Section D Required Client Information	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives										Y/N	Analysis Test	Residual Chlorine (Y/N)	Pace Project No / Lab I.D.
			DATE	TIME				DATE	TIME	UNPRESERVED	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ O ₃	Methanol	Other				
1	MW-301		xxx	1-18-17	11:55	G	2												600736563		
2	MW-302		xxx		13:05	G	2												24891		
3	MW-303		xxx		14:15	G	2												022		
4	MW-304		xxx		15:15	G	2												003		
5	MW-305		xxx		16:20	G	2												004		
6	MW-306		xxx		17:10	G	2												005		
7	FIELD BLANK		xxx	1-19-17	13:15	G	2												006		
8	MW-307		xxx		10:55	G	2												007		
9	MW-308		xxx		11:45	G	2												008		
10	MW-309		xxx		13:30	G	2												009		
11	MW-309		xxx		13:30	G	2												010		
12																					

Section E Additional Comments		Section F Relinquished By / Affidavit		Section G Accepted By / Affiliation		Section H Sample Conditions	
Ship To: 6608 Loiret Boulevard, Lenexa, KS 66219		Paul A. Grotter		1-23-17 16:30		1/24/17 8:40	
Temp in °C		Ice (Y/N)		Custody Sealed (Y/N)		Samples Intact (Y/N)	
SAMPLER NAME AND SIGNATURE		PRINT Name of SAMPLER: Paul A. Grotter		DATE Signed (MM/DD/YY): 1-20-17			
SIGNATURE OF SAMPLER: Paul A. Grotter		DATE Signed (MM/DD/YY): 1-20-17					

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Chain of Custody



30208960

Workorder: 60236563 Workorder Name: Ottumwa Gen. Station/25216072 Owner Received Date: 1/24/2017 Results Requested By: 2/16/2017

Report To: Subcontract To

Trudy Gipson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone (913)599-5665

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone (724)850-5600

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		Requested Analysis		Comments	
						903.1 Radium-226	904.0 Radium-228	903.1 Radium-226	904.0 Radium-228		
1	MW-301	PS	1/18/2017 11:55	60236563001	Water	2		X	X		LAB USE ONLY 001
2	MW-302	PS	1/18/2017 13:05	60236563002	Water	2		X	X		002
3	MW-303	PS	1/18/2017 14:15	60236563003	Water	2		X	X		003
4	MW-304	PS	1/18/2017 15:15	60236563004	Water	2		X	X		004
5	MW-305	PS	1/18/2017 16:20	60236563005	Water	2		X	X		005
6	MW-306	PS	1/18/2017 17:10	60236563006	Water	2		X	X		006
7	FIELD BLANK	PS	1/19/2017 13:15	60236563007	Water	2		X	X		007
8	MW-307	PS	1/19/2017 10:55	60236563008	Water	2		X	X		008
9	MW-308	PS	1/19/2017 11:45	60236563009	Water	2		X	X		009
10	MW-309	PS	1/19/2017 13:30	60236563010	Water	2		X	X		010

Transfers Released By: *Phil Jones* Date/Time: 1/24/17 13:00 Received Date/Time: 1/25/17 10:30

Cooler Temperature on Receipt: *NA* °C Custody Seal: *NA* Received on Ice: *Y* or *N* Samples Intact: *Y* or *N*

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner's document.

WO#: 30208960

Sample Condition Upon Receipt Pittsburgh

30208960 -



Client Name: PaceXS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7044605879165

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ARM 1/25/17

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:		/		
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Organic Samples checked for dechlorination:			/	13.
Filtered volume received for Dissolved tests			/	14.
All containers have been checked for preservation.	/			15.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>PH/2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ARM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	16.
Trip Blank Present:			/	17.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>ARM</u> Date: <u>1/25/17</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A2 Round 2 Background Sampling, Analytical Laboratory Report

May 04, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60242499

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60242499001	MW-301	Water	04/19/17 17:10	04/21/17 09:20
60242499002	MW-302	Water	04/19/17 17:55	04/21/17 09:20
60242499003	MW-303	Water	04/19/17 18:45	04/21/17 09:20
60242499004	MW-304	Water	04/19/17 19:25	04/21/17 09:20
60242499005	MW-305	Water	04/19/17 20:10	04/21/17 09:20
60242499006	MW-306	Water	04/19/17 21:00	04/21/17 09:20
60242499007	FIELD BLANK	Water	04/20/17 12:50	04/21/17 09:20
60242499008	MW-307	Water	04/20/17 12:15	04/21/17 09:20
60242499009	MW-308	Water	04/20/17 13:35	04/21/17 09:20
60242499010	MW-309	Water	04/20/17 14:40	04/21/17 09:20

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60242499001	MW-301	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499002	MW-302	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499003	MW-303	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499004	MW-304	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499005	MW-305	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499006	MW-306	EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60242499007	FIELD BLANK	EPA 6010	ZBM	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60242499008	MW-307	EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
60242499009	MW-308	EPA 9056	RAD	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
60242499010	MW-309	EPA 9056	RAD	3	PASI-K
		EPA 6010	ZBM	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-301		Lab ID: 60242499001		Collected: 04/19/17 17:10		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/19/17 17:00		
Field pH	6.64	Std. Units	0.10	0.050	1		04/19/17 17:00		
Field Temperature	10.8	deg C	0.50	0.25	1		04/19/17 17:00		
Field Specific Conductance	742	umhos/cm	1.0	1.0	1		04/19/17 17:00		
Field Oxidation Potential	148	mV			1		04/19/17 17:00		
Oxygen, Dissolved	5.74	mg/L			1		04/19/17 17:00	7782-44-7	
Turbidity	0.47	NTU	1.0	1.0	1		04/19/17 17:00		
Groundwater Elevation	682.15	feet			1		04/19/17 17:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	565	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 16:54	7440-42-8	
Calcium	61.5	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 16:54	7440-70-2	
Lithium	21.8	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 16:54	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 17:33	7440-36-0	
Arsenic	0.22J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 17:33	7440-38-2	
Barium	35.5	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 17:33	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 17:33	7440-41-7	
Cadmium	0.035J	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 17:33	7440-43-9	
Chromium	0.49J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 17:33	7440-47-3	B
Cobalt	0.97J	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 17:33	7440-48-4	
Lead	0.060J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 17:33	7439-92-1	
Molybdenum	0.54J	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 17:33	7439-98-7	
Selenium	4.2	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 17:33	7782-49-2	
Thallium	0.14J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 17:33	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 11:29	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	499	mg/L	5.0	5.0	1		04/24/17 12:48		
9040 pH		Analytical Method: EPA 9040							
pH	6.7	Std. Units	0.10	0.10	1		04/26/17 12:12		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	54.8	mg/L	10.0	5.0	10		04/25/17 23:48	16887-00-6	
Fluoride	0.24	mg/L	0.20	0.10	1		04/25/17 23:18	16984-48-8	
Sulfate	190	mg/L	10.0	5.0	10		04/25/17 23:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-302 **Lab ID: 60242499002** Collected: 04/19/17 17:55 Received: 04/21/17 09:20 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		04/19/17 17:55		
Field pH	6.78	Std. Units	0.10	0.050	1		04/19/17 17:55		
Field Temperature	12.8	deg C	0.50	0.25	1		04/19/17 17:55		
Field Specific Conductance	2220	umhos/cm	1.0	1.0	1		04/19/17 17:55		
Field Oxidation Potential	121.1	mV			1		04/19/17 17:55		
Oxygen, Dissolved	0.18	mg/L			1		04/19/17 17:55	7782-44-7	
Turbidity	2.32	NTU	1.0	1.0	1		04/19/17 17:55		
Groundwater Elevation	656.35	feet			1		04/19/17 17:55		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1200	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:00	7440-42-8	
Calcium	184	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:00	7440-70-2	
Lithium	10.1	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:00	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 17:42	7440-36-0	
Arsenic	0.25J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 17:42	7440-38-2	
Barium	19.4	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 17:42	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 17:42	7440-41-7	
Cadmium	0.20J	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 17:42	7440-43-9	
Chromium	1.0	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 17:42	7440-47-3	B
Cobalt	0.95J	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 17:42	7440-48-4	
Lead	0.20J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 17:42	7439-92-1	
Molybdenum	0.44J	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 17:42	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 17:42	7782-49-2	
Thallium	0.049J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 17:42	7440-28-0	B
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 11:52	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1670	mg/L	5.0	5.0	1		04/24/17 12:49		
9040 pH									
Analytical Method: EPA 9040									
pH	6.8	Std. Units	0.10	0.10	1		04/26/17 13:01		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	281	mg/L	20.0	10.0	20		04/26/17 00:33	16887-00-6	
Fluoride	0.20J	mg/L	0.20	0.10	1		04/26/17 00:18	16984-48-8	
Sulfate	907	mg/L	100	50.0	100		04/26/17 00:48	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-303		Lab ID: 60242499003		Collected: 04/19/17 18:45		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/19/17 18:45		
Field pH	7.02	Std. Units	0.10	0.050	1		04/19/17 18:45		
Field Temperature	10.6	deg C	0.50	0.25	1		04/19/17 18:45		
Field Specific Conductance	1687	umhos/cm	1.0	1.0	1		04/19/17 18:45		
Field Oxidation Potential	99.5	mV			1		04/19/17 18:45		
Oxygen, Dissolved	0.56	mg/L			1		04/19/17 18:45	7782-44-7	
Turbidity	2.2	NTU	1.0	1.0	1		04/19/17 18:45		
Groundwater Elevation	654.57	feet			1		04/19/17 18:45		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	577	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:02	7440-42-8	
Calcium	226	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:02	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:02	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.16J	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 17:55	7440-36-0	
Arsenic	0.47J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 17:55	7440-38-2	
Barium	79.1	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 17:55	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 17:55	7440-41-7	
Cadmium	0.81	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 17:55	7440-43-9	
Chromium	0.27J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 17:55	7440-47-3	B
Cobalt	1.8	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 17:55	7440-48-4	
Lead	0.068J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 17:55	7439-92-1	
Molybdenum	3.9	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 17:55	7439-98-7	
Selenium	1.1	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 17:55	7782-49-2	
Thallium	0.16J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 17:55	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 11:54	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1170	mg/L	5.0	5.0	1		04/24/17 12:50		
9040 pH		Analytical Method: EPA 9040							
pH	7.2	Std. Units	0.10	0.10	1		04/26/17 13:02		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	141	mg/L	20.0	10.0	20		04/26/17 01:17	16887-00-6	
Fluoride	0.19J	mg/L	0.20	0.10	1		04/26/17 01:02	16984-48-8	
Sulfate	333	mg/L	20.0	10.0	20		04/26/17 01:17	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-304 **Lab ID: 60242499004** Collected: 04/19/17 19:25 Received: 04/21/17 09:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		04/19/17 19:25		
Field pH	7.27	Std. Units	0.10	0.050	1		04/19/17 19:25		
Field Temperature	13.4	deg C	0.50	0.25	1		04/19/17 19:25		
Field Specific Conductance	2139	umhos/cm	1.0	1.0	1		04/19/17 19:25		
Field Oxidation Potential	-40.5	mV			1		04/19/17 19:25		
Oxygen, Dissolved	0.12	mg/L			1		04/19/17 19:25	7782-44-7	
Turbidity	1.95	NTU	1.0	1.0	1		04/19/17 19:25		
Groundwater Elevation	657.48	feet			1		04/19/17 19:25		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1030	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:05	7440-42-8	
Calcium	129	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:05	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:05	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:03	7440-36-0	
Arsenic	0.73J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:03	7440-38-2	
Barium	94.9	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:03	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:03	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:03	7440-43-9	
Chromium	0.56J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:03	7440-47-3	B
Cobalt	0.37J	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:03	7440-48-4	
Lead	0.13J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:03	7439-92-1	
Molybdenum	1.5	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:03	7439-98-7	
Selenium	0.17J	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:03	7782-49-2	
Thallium	0.042J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:03	7440-28-0	B
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 11:56	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1310	mg/L	5.0	5.0	1		04/24/17 12:50		
9040 pH Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		04/26/17 13:04		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	430	mg/L	25.0	12.5	25		04/26/17 02:17	16887-00-6	
Fluoride	0.88	mg/L	0.20	0.10	1		04/26/17 02:02	16984-48-8	
Sulfate	208	mg/L	25.0	12.5	25		04/26/17 02:17	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-305		Lab ID: 60242499005		Collected: 04/19/17 20:10		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/19/17 20:10		
Field pH	7.30	Std. Units	0.10	0.050	1		04/19/17 20:10		
Field Temperature	13.2	deg C	0.50	0.25	1		04/19/17 20:10		
Field Specific Conductance	1822	umhos/cm	1.0	1.0	1		04/19/17 20:10		
Field Oxidation Potential	17.6	mV			1		04/19/17 20:10		
Oxygen, Dissolved	0.15	mg/L			1		04/19/17 20:10	7782-44-7	
Turbidity	0.51	NTU	1.0	1.0	1		04/19/17 20:10		
Groundwater Elevation	663.27	feet			1		04/19/17 20:10		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	907	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:07	7440-42-8	
Calcium	96.2	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:07	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:07	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.063J	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:20	7440-36-0	
Arsenic	0.61J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:20	7440-38-2	
Barium	115	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:20	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:20	7440-41-7	
Cadmium	0.052J	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:20	7440-43-9	
Chromium	0.36J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:20	7440-47-3	B
Cobalt	14.6	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:20	7440-48-4	
Lead	0.093J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:20	7439-92-1	
Molybdenum	5.8	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:20	7439-98-7	
Selenium	0.39J	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:20	7782-49-2	
Thallium	0.34J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:20	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 11:58	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1040	mg/L	5.0	5.0	1		04/24/17 12:51		
9040 pH		Analytical Method: EPA 9040							
pH	7.4	Std. Units	0.10	0.10	1		04/26/17 13:05		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	312	mg/L	20.0	10.0	20		04/26/17 03:02	16887-00-6	
Fluoride	0.38	mg/L	0.20	0.10	1		04/26/17 02:32	16984-48-8	
Sulfate	109	mg/L	10.0	5.0	10		04/26/17 02:47	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-306		Lab ID: 60242499006		Collected: 04/19/17 21:00		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/19/17 21:00		
Field pH	6.79	Std. Units	0.10	0.050	1		04/19/17 21:00		
Field Temperature	13.2	deg C	0.50	0.25	1		04/19/17 21:00		
Field Specific Conductance	1210	umhos/cm	1.0	1.0	1		04/19/17 21:00		
Field Oxidation Potential	70.9	mV			1		04/19/17 21:00		
Oxygen, Dissolved	0.21	mg/L			1		04/19/17 21:00	7782-44-7	
Turbidity	0.13	NTU	1.0	1.0	1		04/19/17 21:00		
Groundwater Elevation	670.69	feet			1		04/19/17 21:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	814	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:09	7440-42-8	
Calcium	81.3	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:09	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:09	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.051J	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:25	7440-36-0	
Arsenic	0.42J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:25	7440-38-2	
Barium	54.3	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:25	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:25	7440-41-7	
Cadmium	0.72	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:25	7440-43-9	
Chromium	0.52J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:25	7440-47-3	B
Cobalt	5.7	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:25	7440-48-4	
Lead	0.038J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:25	7439-92-1	
Molybdenum	4.7	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:25	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:25	7782-49-2	
Thallium	0.14J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:25	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 12:01	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	819	mg/L	5.0	5.0	1		04/24/17 12:52		
9040 pH		Analytical Method: EPA 9040							
pH	7.0	Std. Units	0.10	0.10	1		04/26/17 13:06		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	58.5	mg/L	5.0	2.5	5		04/26/17 03:32	16887-00-6	
Fluoride	0.11J	mg/L	0.20	0.10	1		04/26/17 03:17	16984-48-8	
Sulfate	300	mg/L	20.0	10.0	20		04/26/17 03:46	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: FIELD BLANK Lab ID: 60242499007 Collected: 04/20/17 12:50 Received: 04/21/17 09:20 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	ND	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:16	7440-42-8	
Calcium	ND	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:16	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:16	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:16	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:16	7440-38-2	
Barium	0.27J	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:16	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:16	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:16	7440-43-9	
Chromium	0.16J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:16	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:16	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:16	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:16	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:16	7782-49-2	
Thallium	0.066J	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:16	7440-28-0	B
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 12:03	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		04/24/17 12:58		
9040 pH Analytical Method: EPA 9040									
pH	5.5	Std. Units	0.10	0.10	1		04/27/17 08:41		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	ND	mg/L	1.0	0.50	1		04/25/17 23:03	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		04/25/17 23:03	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		04/25/17 23:03	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-307		Lab ID: 60242499008		Collected: 04/20/17 12:15		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/20/17 12:15		
Field pH	6.51	Std. Units	0.10	0.050	1		04/20/17 12:15		
Field Temperature	12.0	deg C	0.50	0.25	1		04/20/17 12:15		
Field Specific Conductance	1648	umhos/cm	1.0	1.0	1		04/20/17 12:15		
Field Oxidation Potential	-16.0	mV			1		04/20/17 12:15		
Oxygen, Dissolved	0.20	mg/L			1		04/20/17 12:15	7782-44-7	
Turbidity	66.67	NTU	1.0	1.0	1		04/20/17 12:15		
Groundwater Elevation	653.62	feet			1		04/20/17 12:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	205	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:19	7440-42-8	
Calcium	241	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:19	7440-70-2	
Lithium	9.4J	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:19	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:29	7440-36-0	
Arsenic	0.96J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:29	7440-38-2	
Barium	139	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:29	7440-39-3	
Beryllium	0.029J	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:29	7440-41-7	
Cadmium	0.025J	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:29	7440-43-9	
Chromium	1.6	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:29	7440-47-3	
Cobalt	1.6	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:29	7440-48-4	
Lead	0.49J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:29	7439-92-1	
Molybdenum	0.56J	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:29	7439-98-7	
Selenium	0.12J	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:29	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:29	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 12:05	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1100	mg/L	5.0	5.0	1		04/24/17 12:59		
9040 pH		Analytical Method: EPA 9040							
pH	6.9	Std. Units	0.10	0.10	1		04/27/17 09:02		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	201	mg/L	20.0	10.0	20		04/26/17 10:23	16887-00-6	
Fluoride	0.13J	mg/L	0.20	0.10	1		04/26/17 09:54	16984-48-8	
Sulfate	105	mg/L	10.0	5.0	10		04/26/17 10:08	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-308 Lab ID: 60242499009 Collected: 04/20/17 13:35 Received: 04/21/17 09:20 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		04/20/17 13:35		
Field pH	6.70	Std. Units	0.10	0.050	1		04/20/17 13:35		
Field Temperature	11.9	deg C	0.50	0.25	1		04/20/17 13:35		
Field Specific Conductance	1509	umhos/cm	1.0	1.0	1		04/20/17 13:35		
Field Oxidation Potential	1.7	mV			1		04/20/17 13:35		
Oxygen, Dissolved	0.21	mg/L			1		04/20/17 13:35	7782-44-7	
Turbidity	4.6	NTU	1.0	1.0	1		04/20/17 13:35		
Groundwater Elevation	651.09	feet			1		04/20/17 13:35		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	146	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:21	7440-42-8	
Calcium	222	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:21	7440-70-2	
Lithium	13.3	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:21	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:33	7440-36-0	
Arsenic	0.34J	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:33	7440-38-2	
Barium	118	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:33	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:33	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:33	7440-43-9	
Chromium	0.44J	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:33	7440-47-3	B
Cobalt	0.43J	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:33	7440-48-4	
Lead	0.066J	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:33	7439-92-1	
Molybdenum	0.53J	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:33	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:33	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:33	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 12:07	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1100	mg/L	5.0	5.0	1		04/24/17 12:59		
9040 pH									
Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		04/27/17 09:04		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	149	mg/L	10.0	5.0	10		04/26/17 11:22	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.10	1		04/26/17 11:07	16984-48-8	
Sulfate	283	mg/L	25.0	12.5	25		04/26/17 11:37	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Sample: MW-309		Lab ID: 60242499010		Collected: 04/20/17 14:40		Received: 04/21/17 09:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		04/20/17 14:40		
Field pH	7.01	Std. Units	0.10	0.050	1		04/20/17 14:40		
Field Temperature	12.1	deg C	0.50	0.25	1		04/20/17 14:40		
Field Specific Conductance	1430	umhos/cm	1.0	1.0	1		04/20/17 14:40		
Field Oxidation Potential	0.2	mV			1		04/20/17 14:40		
Oxygen, Dissolved	0.16	mg/L			1		04/20/17 14:40	7782-44-7	
Turbidity	77.74	NTU	1.0	1.0	1		04/20/17 14:40		
Groundwater Elevation	650.16	feet			1		04/20/17 14:40		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1280	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:23	7440-42-8	
Calcium	152	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:23	7440-70-2	
Lithium	9.3J	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:23	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:37	7440-36-0	
Arsenic	1.1	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:37	7440-38-2	
Barium	62.4	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:37	7440-39-3	
Beryllium	0.073J	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:37	7440-41-7	
Cadmium	0.042J	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:37	7440-43-9	
Chromium	3.2	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:37	7440-47-3	
Cobalt	3.1	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:37	7440-48-4	
Lead	1.0	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:37	7439-92-1	
Molybdenum	0.32J	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:37	7439-98-7	
Selenium	0.22J	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:37	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:37	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	04/27/17 16:30	04/28/17 12:14	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1030	mg/L	5.0	5.0	1		04/25/17 15:00		
9040 pH		Analytical Method: EPA 9040							
pH	7.4	Std. Units	0.10	0.10	1		04/27/17 09:05		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	73.7	mg/L	10.0	5.0	10		04/26/17 12:06	16887-00-6	
Fluoride	0.13J	mg/L	0.20	0.10	1		04/26/17 11:51	16984-48-8	
Sulfate	393	mg/L	50.0	25.0	50		04/26/17 12:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 474522 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009, 60242499010

METHOD BLANK: 1943373 Matrix: Water
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009, 60242499010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.046	04/28/17 11:25	

LABORATORY CONTROL SAMPLE: 1943374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1943375 1943376

Parameter	Units	60242499001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	5.1	4.8	101	96	75-125	6	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 473999 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007,
 60242499008, 60242499009, 60242499010

METHOD BLANK: 1941428 Matrix: Water
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007,
 60242499008, 60242499009, 60242499010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	3.6J	100	3.5	04/25/17 16:51	
Calcium	mg/L	ND	0.10	0.036	04/25/17 16:51	
Lithium	ug/L	ND	10.0	2.9	04/25/17 16:51	

LABORATORY CONTROL SAMPLE: 1941429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	976	98	80-120	
Calcium	mg/L	10	10.1	101	80-120	
Lithium	ug/L	1000	1050	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1941430 1941431

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60242499001 Result	Spike Conc.	Spike Conc.	MS Result						
Boron	ug/L	565	1000	1000	1560	1580	100	101	75-125	1	20
Calcium	mg/L	61.5	10	10	71.6	72.6	102	111	75-125	1	20
Lithium	ug/L	21.8	1000	1000	1100	1110	108	108	75-125	1	20

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch:	474000	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3010	Analysis Description:	6020 MET
Associated Lab Samples:	60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009, 60242499010		

METHOD BLANK:	1941432	Matrix:	Water
Associated Lab Samples:	60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009, 60242499010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	05/03/17 17:25	
Arsenic	ug/L	ND	1.0	0.052	05/03/17 17:25	
Barium	ug/L	0.098J	1.0	0.095	05/03/17 17:25	
Beryllium	ug/L	ND	0.50	0.012	05/03/17 17:25	
Cadmium	ug/L	ND	0.50	0.018	05/03/17 17:25	
Chromium	ug/L	0.14J	1.0	0.054	05/03/17 17:25	
Cobalt	ug/L	ND	1.0	0.014	05/03/17 17:25	
Lead	ug/L	ND	1.0	0.033	05/03/17 17:25	
Molybdenum	ug/L	ND	1.0	0.058	05/03/17 17:25	
Selenium	ug/L	ND	1.0	0.086	05/03/17 17:25	
Thallium	ug/L	0.069J	1.0	0.036	05/03/17 17:25	

LABORATORY CONTROL SAMPLE: 1941433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.0	100	80-120	
Arsenic	ug/L	40	40.0	100	80-120	
Barium	ug/L	40	39.6	99	80-120	
Beryllium	ug/L	40	40.3	101	80-120	
Cadmium	ug/L	40	39.3	98	80-120	
Chromium	ug/L	40	41.0	102	80-120	
Cobalt	ug/L	40	40.0	100	80-120	
Lead	ug/L	40	39.1	98	80-120	
Molybdenum	ug/L	40	41.6	104	80-120	
Selenium	ug/L	40	38.6	96	80-120	
Thallium	ug/L	40	37.6	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1941434 1941435

Parameter	Units	60242499002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Antimony	ug/L	ND	40	40	40	40.2	39.8	100	99	75-125	1	20	
Arsenic	ug/L	0.25J	40	40	40	39.1	39.2	97	97	75-125	0	20	
Barium	ug/L	19.4	40	40	40	59.4	59.8	100	101	75-125	1	20	
Beryllium	ug/L	ND	40	40	40	32.6	32.2	82	81	75-125	1	20	
Cadmium	ug/L	0.20J	40	40	40	36.6	35.8	91	89	75-125	2	20	
Chromium	ug/L	1.0	40	40	40	40.0	40.7	97	99	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Parameter	Units	60242499002		1941434		1941435		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
Cobalt	ug/L	0.95J	40	40	38.9	38.4	95	94	75-125	1	20			
Lead	ug/L	0.20J	40	40	36.0	35.8	89	89	75-125	0	20			
Molybdenum	ug/L	0.44J	40	40	43.3	42.9	107	106	75-125	1	20			
Selenium	ug/L	ND	40	40	36.6	37.0	91	92	75-125	1	20			
Thallium	ug/L	0.049J	40	40	35.4	35.6	88	89	75-125	0	20			

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 473939

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009

METHOD BLANK: 1941301

Matrix: Water

Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007, 60242499008, 60242499009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	04/24/17 12:46	

LABORATORY CONTROL SAMPLE: 1941302

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 1941303

Parameter	Units	60242499001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	499	498	0	10	

SAMPLE DUPLICATE: 1941304

Parameter	Units	60242633002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	851	855	0	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 474124	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60242499010	

METHOD BLANK: 1941877 Matrix: Water
Associated Lab Samples: 60242499010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	04/25/17 14:57	

LABORATORY CONTROL SAMPLE: 1941878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	972	97	80-120	

SAMPLE DUPLICATE: 1941879

Parameter	Units	60242499010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1030	1020	1	10	

SAMPLE DUPLICATE: 1941880

Parameter	Units	60242716004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1710	1670	3	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 473975 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006

SAMPLE DUPLICATE: 1941389

Parameter	Units	60242633001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.8	7.5	4	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 474264 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60242499007, 60242499008, 60242499009, 60242499010

SAMPLE DUPLICATE: 1942399

Parameter	Units	60242501006 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	5.3	5.9	10	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 474065 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007

METHOD BLANK: 1941686 Matrix: Water
 Associated Lab Samples: 60242499001, 60242499002, 60242499003, 60242499004, 60242499005, 60242499006, 60242499007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	04/25/17 17:50	
Fluoride	mg/L	ND	0.20	0.10	04/25/17 17:50	
Sulfate	mg/L	ND	1.0	0.50	04/25/17 17:50	

LABORATORY CONTROL SAMPLE: 1941687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	80-120	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1941688 1941689

Parameter	Units	40148600005 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chloride	mg/L	1160 ug/L	5	5	6.0	6.2	97	100	80-120	2	15
Fluoride	mg/L	0.64	2.5	2.5	3.2	3.3	104	105	80-120	1	15

SAMPLE DUPLICATE: 1941690

Parameter	Units	60242499001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	54.8	53.1	3	15	
Fluoride	mg/L	0.24	0.24	2	15	
Sulfate	mg/L	190	184	3	15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

QC Batch: 474218 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60242499008, 60242499009, 60242499010

METHOD BLANK: 1942227 Matrix: Water

Associated Lab Samples: 60242499008, 60242499009, 60242499010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	04/26/17 08:27	
Fluoride	mg/L	ND	0.20	0.10	04/26/17 08:27	
Sulfate	mg/L	ND	1.0	0.50	04/26/17 08:27	

LABORATORY CONTROL SAMPLE: 1942228

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.4	98	80-120	
Sulfate	mg/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1942229 1942230

Parameter	Units	60242633004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	12.9	5	5	18.4	18.3	109	109	80-120	0	15		
Fluoride	mg/L	0.22	2.5	2.5	2.9	2.9	107	107	80-120	0	15		
Sulfate	mg/L	ND	5	5	5.2	5.2	104	103	80-120	1	15		

SAMPLE DUPLICATE: 1942231

Parameter	Units	60242652004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	13.5	13.5	0	15	
Fluoride	mg/L	0.13J	0.13J		15	
Sulfate	mg/L	ND	ND		15	

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60242499001	MW-301		475139		
60242499002	MW-302		475139		
60242499003	MW-303		475139		
60242499004	MW-304		475139		
60242499005	MW-305		475139		
60242499006	MW-306		475139		
60242499008	MW-307		475139		
60242499009	MW-308		475139		
60242499010	MW-309		475139		
60242499001	MW-301	EPA 3010	473999	EPA 6010	474020
60242499002	MW-302	EPA 3010	473999	EPA 6010	474020
60242499003	MW-303	EPA 3010	473999	EPA 6010	474020
60242499004	MW-304	EPA 3010	473999	EPA 6010	474020
60242499005	MW-305	EPA 3010	473999	EPA 6010	474020
60242499006	MW-306	EPA 3010	473999	EPA 6010	474020
60242499007	FIELD BLANK	EPA 3010	473999	EPA 6010	474020
60242499008	MW-307	EPA 3010	473999	EPA 6010	474020
60242499009	MW-308	EPA 3010	473999	EPA 6010	474020
60242499010	MW-309	EPA 3010	473999	EPA 6010	474020
60242499001	MW-301	EPA 3010	474000	EPA 6020	474021
60242499002	MW-302	EPA 3010	474000	EPA 6020	474021
60242499003	MW-303	EPA 3010	474000	EPA 6020	474021
60242499004	MW-304	EPA 3010	474000	EPA 6020	474021
60242499005	MW-305	EPA 3010	474000	EPA 6020	474021
60242499006	MW-306	EPA 3010	474000	EPA 6020	474021
60242499007	FIELD BLANK	EPA 3010	474000	EPA 6020	474021
60242499008	MW-307	EPA 3010	474000	EPA 6020	474021
60242499009	MW-308	EPA 3010	474000	EPA 6020	474021
60242499010	MW-309	EPA 3010	474000	EPA 6020	474021
60242499001	MW-301	EPA 7470	474522	EPA 7470	474566
60242499002	MW-302	EPA 7470	474522	EPA 7470	474566
60242499003	MW-303	EPA 7470	474522	EPA 7470	474566
60242499004	MW-304	EPA 7470	474522	EPA 7470	474566
60242499005	MW-305	EPA 7470	474522	EPA 7470	474566
60242499006	MW-306	EPA 7470	474522	EPA 7470	474566
60242499007	FIELD BLANK	EPA 7470	474522	EPA 7470	474566
60242499008	MW-307	EPA 7470	474522	EPA 7470	474566
60242499009	MW-308	EPA 7470	474522	EPA 7470	474566
60242499010	MW-309	EPA 7470	474522	EPA 7470	474566
60242499001	MW-301	SM 2540C	473939		
60242499002	MW-302	SM 2540C	473939		
60242499003	MW-303	SM 2540C	473939		
60242499004	MW-304	SM 2540C	473939		
60242499005	MW-305	SM 2540C	473939		
60242499006	MW-306	SM 2540C	473939		
60242499007	FIELD BLANK	SM 2540C	473939		
60242499008	MW-307	SM 2540C	473939		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242499

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60242499009	MW-308	SM 2540C	473939		
60242499010	MW-309	SM 2540C	474124		
60242499001	MW-301	EPA 9040	473975		
60242499002	MW-302	EPA 9040	473975		
60242499003	MW-303	EPA 9040	473975		
60242499004	MW-304	EPA 9040	473975		
60242499005	MW-305	EPA 9040	473975		
60242499006	MW-306	EPA 9040	473975		
60242499007	FIELD BLANK	EPA 9040	474264		
60242499008	MW-307	EPA 9040	474264		
60242499009	MW-308	EPA 9040	474264		
60242499010	MW-309	EPA 9040	474264		
60242499001	MW-301	EPA 9056	474065		
60242499002	MW-302	EPA 9056	474065		
60242499003	MW-303	EPA 9056	474065		
60242499004	MW-304	EPA 9056	474065		
60242499005	MW-305	EPA 9056	474065		
60242499006	MW-306	EPA 9056	474065		
60242499007	FIELD BLANK	EPA 9056	474065		
60242499008	MW-307	EPA 9056	474218		
60242499009	MW-308	EPA 9056	474218		
60242499010	MW-309	EPA 9056	474218		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60242499



Client Name: SCS

Courier: FedEx [] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 0677 74892820 Pace Shipping Label Used? Yes [] No [x]

Custody Seal on Cooler/Box Present: Yes [x] No [] Seals intact: Yes [x] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [x] Other []

Thermometer Used: T-266 [] T-239 [x] Type of Ice: Wet [x] Blue [] None []

Cooler Temperature (°C): As-read 1.4 Corr. Factor CF +1.5 CF +0.2 Corrected 2.9

Date and initials of person examining contents:

04/21/17

Temperature should be above freezing to 6°C

Table with 2 columns: Question/Field and Answer/Status. Rows include Chain of Custody, Samples arrived, Short Hold Time, Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, Lead acetate strip, Potassium iodide test strip, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, Additional labels attached.

Client Notification/ Resolution: Copy COC to Client? Y / [N] Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 4-21-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:
Company: SCS Engineers
Address: 2830 Dairy Drive
Madison WI 53718
Email To: mblodgett@scsengineers.com
Phone 608-216-7362 Fax:
Requested Due Date/TAT:

Section B Required Project Information:
Report To: Meghan Blodgett
Copy To: Tom Karwaski
Purchase Order No.:
Project Name: Ottumwa Generating Station
Project Number: 25216072

Section C Invoice Information:
Attention: Meghan Blodgett/Jess Valcheff
Company Name: SCS Engineers
Address:
Preserve Order No.:
Reference:
Project Manager: Trudy Gipson 913-563-1405
Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER
Site Location: IA STATE: IA

Page: _____ of _____

ITEM #	Classification	Valid Matrix Codes MATRIX CODE DW DRINKING WATER WT WATER WW WASTE WATER P PRODUCT SL SOILSOLID OL OIL WP WIPE AR AIR OT OTHER TS TISSUE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																		
				COMPOSITE START	COMPOSITE END/GRAB					Y	N	Analysis Test ↑	H2SO4	HNO3	HCl	NaOH	Na2SO3	Methanol	Other																				
1	MW-301		WT G	xxx	xxx	4-20-17	18:00	18:00	2	1	1																											18P20 18P20 20	007
2	MW-302		WT G	xxx	xxx	4-20-17	17:55	17:55	2	1	1																											002	
3	MW-303		WT G	xxx	xxx	4-20-17	18:45	18:45	2	1	1																											003	
4	MW-304		WT G	xxx	xxx	4-20-17	19:05	19:05	2	1	1																											004	
5	MW-305		WT G	xxx	xxx	4-20-17	21:00	21:00	2	1	1																											005	
6	MW-306		WT G	xxx	xxx	4-20-17	21:50	21:50	2	1	1																											006	
7	FIELD BLANK		WT G	xxx	xxx	4-20-17	12:50	12:50	2	1	1																											18P14 18P14	007
8	MW 307																																					008	
9	MW 308																																					009	
10	MW 309																																					010	

ADDITIONAL COMMENTS
Ship To: 9450 Loret Boulevard, Lenexa, KS 66219
* Sb-As-Ba-Bi-Cd-Cr-Co-Pb-Mo-Se-Tl

RELINQUISHED BY / AFFILIATION Paul A. Ann
DATE 4-20-17
TIME 16:00

ACCEPTED BY / AFFILIATION *[Signature]*
DATE 4/21/17
TIME 0920

SAMPLE CONDITIONS
Received on Ice (Y/N) X
Custody Sealed (Y/N) X
Samples Intact (Y/N) X

SAMPLER NAME AND SIGNATURE Field Blank New HH03
PRINT Name of SAMPLER: Added ASAP
SIGNATURE of SAMPLER:

May 16, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60242519

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60242519001	MW-301	Water	04/19/17 17:10	04/21/17 09:20
60242519002	MW-302	Water	04/19/17 17:55	04/21/17 09:20
60242519003	MW-303	Water	04/19/17 18:45	04/21/17 09:20
60242519004	MW-304	Water	04/19/17 19:25	04/21/17 09:20
60242519005	MW-305	Water	04/19/17 20:10	04/21/17 09:20
60242519006	MW-306	Water	04/19/17 21:00	04/21/17 09:20
60242519007	FIELD BLANK	Water	04/20/17 12:50	04/21/17 09:20
60242519008	MW 307	Water	04/20/17 12:15	04/21/17 09:20
60242519009	MW 308	Water	04/20/17 13:35	04/21/17 09:20
60242519010	MW 309	Water	04/20/17 14:40	04/21/17 09:20

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60242519001	MW-301	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519002	MW-302	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519003	MW-303	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519004	MW-304	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519005	MW-305	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519006	MW-306	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519007	FIELD BLANK	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519008	MW 307	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519009	MW 308	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242519010	MW 309	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-301 **Lab ID: 60242519001** Collected: 04/19/17 17:10 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.139 ± 0.509 (0.979) C:NA T:92%	pCi/L	05/06/17 19:10	13982-63-3	
Radium-228	EPA 904.0	0.492 ± 0.420 (0.845) C:69% T:86%	pCi/L	05/08/17 18:49	15262-20-1	
Total Radium	Total Radium Calculation	0.631 ± 0.929 (1.82)	pCi/L	05/16/17 15:47	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-302 **Lab ID: 60242519002** Collected: 04/19/17 17:55 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.342 ± 0.485 (0.822) C:NA T:92%	pCi/L	05/06/17 19:10	13982-63-3	
Radium-228	EPA 904.0	0.434 ± 0.437 (0.906) C:67% T:84%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	0.776 ± 0.922 (1.73)	pCi/L	05/16/17 15:47	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-303 **Lab ID: 60242519003** Collected: 04/19/17 18:45 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.06 ± 0.676 (0.872) C:NA T:92%	pCi/L	05/06/17 19:22	13982-63-3	
Radium-228	EPA 904.0	0.556 ± 0.444 (0.884) C:66% T:84%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	1.62 ± 1.12 (1.76)	pCi/L	05/16/17 15:47	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-304 **Lab ID: 60242519004** Collected: 04/19/17 19:25 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.894 ± 0.565 (0.638) C:NA T:86%	pCi/L	05/06/17 19:10	13982-63-3	
Radium-228	EPA 904.0	1.55 ± 0.578 (0.877) C:67% T:85%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	2.44 ± 1.14 (1.52)	pCi/L	05/16/17 15:47	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-305 **Lab ID: 60242519005** Collected: 04/19/17 20:10 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.494 ± 0.502 (0.759) C:NA T:91%	pCi/L	05/06/17 19:24	13982-63-3	
Radium-228	EPA 904.0	0.179 ± 0.396 (0.879) C:69% T:78%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	0.673 ± 0.898 (1.64)	pCi/L	05/16/17 15:48	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW-306 **Lab ID: 60242519006** Collected: 04/19/17 21:00 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0761 ± 0.347 (0.707) C:NA T:82%	pCi/L	05/06/17 19:24	13982-63-3	
Radium-228	EPA 904.0	0.137 ± 0.401 (0.897) C:68% T:86%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	0.213 ± 0.748 (1.60)	pCi/L	05/16/17 15:48	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: FIELD BLANK **Lab ID: 60242519007** Collected: 04/20/17 12:50 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.332 ± 0.346 (0.488) C:NA T:96%	pCi/L	05/06/17 19:24	13982-63-3	
Radium-228	EPA 904.0	0.130 ± 0.414 (0.930) C:66% T:83%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	0.462 ± 0.760 (1.42)	pCi/L	05/16/17 15:48	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW 307 **Lab ID: 60242519008** Collected: 04/20/17 12:15 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.72 ± 0.663 (0.499) C:NA T:94%	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	1.05 ± 0.649 (1.22) C:77% T:52%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	2.77 ± 1.31 (1.72)	pCi/L	05/16/17 15:48	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW 308 **Lab ID: 60242519009** Collected: 04/20/17 13:35 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.173 ± 0.409 (0.916) C:NA T:88%	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	0.496 ± 0.456 (0.936) C:76% T:76%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	0.496 ± 0.865 (1.85)	pCi/L	05/16/17 15:48	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Sample: MW 309 **Lab ID: 60242519010** Collected: 04/20/17 14:40 Received: 04/21/17 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.968 ± 0.591 (0.726) C:NA T:84%	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	1.26 ± 0.741 (1.37) C:68% T:51%	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	2.23 ± 1.33 (2.10)	pCi/L	05/16/17 15:48	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

QC Batch: 256704 Analysis Method: EPA 904.0
 QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
 Associated Lab Samples: 60242519001, 60242519002, 60242519003, 60242519004, 60242519005, 60242519006, 60242519007,
 60242519008, 60242519009, 60242519010

METHOD BLANK: 1264281 Matrix: Water
 Associated Lab Samples: 60242519001, 60242519002, 60242519003, 60242519004, 60242519005, 60242519006, 60242519007,
 60242519008, 60242519009, 60242519010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.162 ± 0.408 (0.911) C:60% T:80%	pCi/L	05/08/17 14:58	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

QC Batch:	256703	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60242519001, 60242519002, 60242519003, 60242519004, 60242519005, 60242519006, 60242519007, 60242519008, 60242519009, 60242519010		

METHOD BLANK:	1264280	Matrix:	Water
Associated Lab Samples:	60242519001, 60242519002, 60242519003, 60242519004, 60242519005, 60242519006, 60242519007, 60242519008, 60242519009, 60242519010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.319 ± 0.385 (0.587) C:NA T:88%	pCi/L	05/06/17 18:54	

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60242519

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60242519001	MW-301	EPA 903.1	256703		
60242519002	MW-302	EPA 903.1	256703		
60242519003	MW-303	EPA 903.1	256703		
60242519004	MW-304	EPA 903.1	256703		
60242519005	MW-305	EPA 903.1	256703		
60242519006	MW-306	EPA 903.1	256703		
60242519007	FIELD BLANK	EPA 903.1	256703		
60242519008	MW 307	EPA 903.1	256703		
60242519009	MW 308	EPA 903.1	256703		
60242519010	MW 309	EPA 903.1	256703		
60242519001	MW-301	EPA 904.0	256704		
60242519002	MW-302	EPA 904.0	256704		
60242519003	MW-303	EPA 904.0	256704		
60242519004	MW-304	EPA 904.0	256704		
60242519005	MW-305	EPA 904.0	256704		
60242519006	MW-306	EPA 904.0	256704		
60242519007	FIELD BLANK	EPA 904.0	256704		
60242519008	MW 307	EPA 904.0	256704		
60242519009	MW 308	EPA 904.0	256704		
60242519010	MW 309	EPA 904.0	256704		
60242519001	MW-301	Total Radium Calculation	258651		
60242519002	MW-302	Total Radium Calculation	258651		
60242519003	MW-303	Total Radium Calculation	258651		
60242519004	MW-304	Total Radium Calculation	258651		
60242519005	MW-305	Total Radium Calculation	258652		
60242519006	MW-306	Total Radium Calculation	258652		
60242519007	FIELD BLANK	Total Radium Calculation	258652		
60242519008	MW 307	Total Radium Calculation	258652		
60242519009	MW 308	Total Radium Calculation	258652		
60242519010	MW 309	Total Radium Calculation	258652		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60242519



Client Name: SCS Engineers

Courier: FedEx [x] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 8677 7489 2808 Pace Shipping Label Used? Yes [] No []

Custody Seal on Cooler/Box Present: Yes [x] No [] Seals intact: Yes [x] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [x] Other []

Thermometer Used: T-266 / T-239 Type of Ice: Wet [x] Blue [] None []

Cooler Temperature (°C): As-read 17.0 Corr. Factor 18.5 Corrected

Date and initials of person examining contents: 5/9/17

Temperature should be above freezing to 6°C

Table with 2 columns: Question and Yes/No/N/A options. Rows include Chain of Custody, Short Hold Time, Rush Turn Around Time, Sufficient volume, Containers intact, etc.

Client Notification/ Resolution: Copy COC to Client? Y / [x] N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Date: 4-21-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A Required Client Information:
Company: SCS Engineers
Address: 2830 Dairy Drive
Email To: mblodgett@scsengineers.com
Phone/Fax: 608-216-7362
Required Due Date/TAT: 1/20/2019

Section B Required Project Information:
Report To: Meghan Blodgett
Copy To: Tom Karwaski
Purchase Order No.:
Project Name: Ottumwa Generating Station
Project Number: 25216072

Section C Invoice Information:
Attention: Meghan Blodgett/Jess Valcheff
Company Name: SCS Engineers
Address:
Pace Quote Reference:
Pace Project Reference: Trudy Gipson 913-563-1405
Pace Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location
STATE: IA

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOILSOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives H2SO4 HNO3 HCl NaOH Na2SO3 Methanol Other	Analysis Test ↑	Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No / Lab I.D.				
			DATE	TIME					Y	N						
			MATRIX CODE (see valid codes to left)	DATE					TIME	DATE			TIME	DATE	TIME	DATE
1	MW-301		WT G	xxx	4-19-17	17:10	2		X	X	X	001				
2	MW-302		WT G	xxx	4-19-17	17:58	2		X	X	X	002				
3	MW-303		WT G	xxx	4-19-17	18:45	2		X	X	X	003				
4	MW-304		WT G	xxx	4-19-17	19:25	2		X	X	X	004				
5	MW-305		WT G	xxx	4-19-17	20:10	2		X	X	X	005				
6	MW-306		WT G	xxx	4-19-17	21:00	2		X	X	X	006				
7	FIELD BLANK		WT G	xxx	4-19-17	12:50	2		X	X	X	007				
8	MW 307		WT G	xxx	4-19-17	12:15	2		X	X	X	008				
9	MW 308		WT G	xxx	4-19-17	13:35	2		X	X	X	009				
10	MW 309		WT G	xxx	4-19-17	14:42	2		X	X	X	010				
11																
12																
ADDITIONAL COMMENTS												Temp in °C	Received on	Cooler (Y/N)	Samples Intact (Y/N)	
Ship To: 9408 Loiret Boulevard, Lenexa, KS 66219 FIELD Blank Held HNO3 Added ASAP Relinquished by Affiliation: Paul A. G. M. M. Date: 4-20-17 16:00 Accepted by Affiliation: [Signature]												18.5	4/21/17	0420	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: _____
 SIGNATURE of SAMPLER: _____
 DATE Signed (MM/DD/YY): _____

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Chain of Custody

30217006 -

 Pace Analytical®
 www.paceanalytical.com

Workorder: 60242519 Subcontract To Workorder Name: Ottumwa Gen. Station/25216072 Owner Received Date: 4/21/2017 Results Requested By: 5/16/2017

Trudy Gipson
 Pace Analytical Kansas
 9608 Loiret Blvd.
 Lenexa, KS 66219
 Phone 1(913)563-1405

Pace Analytical Pittsburgh
 1638 Roseytown Road
 Suites 2,3, & 4
 Greensburg, PA 15601
 Phone (724)850-5600

Requested Analysis

WO#: 30217006



30217006

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		903.1 Radium-226	904.0 Radium-228	Total Radium	Comments
1	MW-301	PS	4/19/2017 17:10	60242519001	Water	2		X	X	X	001
2	MW-302	PS	4/19/2017 17:55	60242519002	Water	2		X	X	X	002
3	MW-303	PS	4/19/2017 18:45	60242519003	Water	2		X	X	X	003
4	MW-304	PS	4/19/2017 19:25	60242519004	Water	2		X	X	X	004
5	MW-305	PS	4/19/2017 20:10	60242519005	Water	2		X	X	X	005
6	MW-306	PS	4/19/2017 21:00	60242519006	Water	2		X	X	X	006
7	FIELD BLANK	PS	4/20/2017 12:50	60242519007	Water	2		X	X	X	007
8	MW 307	PS	4/20/2017 12:15	60242519008	Water	2		X	X	X	008
9	MW 308	PS	4/20/2017 13:35	60242519009	Water	2		X	X	X	009
10	MW 309	PS	4/20/2017 14:40	60242519010	Water	2		X	X	X	010

Transfers Released By: *[Signature]* Date/Time: 4/21/17 17:00
 Received: *[Signature]* Date/Time: 4/25/17 1000

Cooler Temperature on Receipt: NA °C Custody Seal: Y or N Received on Ice: Y or N Samples Intact: Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Pittsburgh

ML

30217006



Client Name: PaceKS

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: Rippedoff

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NIA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ARM 4/25/17

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:	/	/		4.
Sample Labels match COC:				5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:		/		
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Organic Samples checked for dechlorination:			/	13.
Filtered volume received for Dissolved tests			/	14. <u>ARM 4/25/17</u>
All containers have been checked for preservation.	/			15. <u>PH 2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed: <u>ARM</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	16.
Trip Blank Present:			/	17.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>ARM</u> Date: <u>4/25/17</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A3 Round 3 Background Sampling, Analytical Laboratory Report

July 05, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60247194

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on June 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247194001	MW-301	Water	06/20/17 16:15	06/23/17 08:35
60247194002	MW-302	Water	06/20/17 17:15	06/23/17 08:35
60247194003	MW-303	Water	06/20/17 18:15	06/23/17 08:35
60247194004	MW-304	Water	06/21/17 08:45	06/23/17 08:35
60247194005	MW-305	Water	06/21/17 13:00	06/23/17 08:35
60247194006	MW-306	Water	06/21/17 12:15	06/23/17 08:35
60247194007	MW-307	Water	06/21/17 10:05	06/23/17 08:35
60247194008	MW-308	Water	06/21/17 10:40	06/23/17 08:35
60247194009	MW-309	Water	06/21/17 11:10	06/23/17 08:35
60247194010	FIELD BLANK	Water	06/21/17 12:30	06/23/17 08:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247194001	MW-301	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194002	MW-302	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194003	MW-303	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194004	MW-304	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194005	MW-305	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194006	MW-306	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194007	MW-307	EPA 6010	TDS	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247194008	MW-308	EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
		EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
60247194009	MW-309	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
		EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
60247194010	FIELD BLANK	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	RAD	3	PASI-K
		EPA 6010	TDS	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-301		Lab ID: 60247194001		Collected: 06/20/17 16:15		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/20/17 16:15		
Field pH	6.31	Std. Units	0.10	0.050	1		06/20/17 16:15		
Field Temperature	17.3	deg C	0.50	0.25	1		06/20/17 16:15		
Field Specific Conductance	758	umhos/cm	1.0	1.0	1		06/20/17 16:15		
Field Oxidation Potential	67.2	mV			1		06/20/17 16:15		
Oxygen, Dissolved	4.34	mg/L			1		06/20/17 16:15	7782-44-7	
Turbidity	0.38	NTU	1.0	1.0	1		06/20/17 16:15		
Groundwater Elevation	681.91	feet			1		06/20/17 16:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	657	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:31	7440-42-8	
Calcium	59.3	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:31	7440-70-2	
Lithium	24.9	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:31	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.054J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:03	7440-36-0	
Arsenic	0.15J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:03	7440-38-2	
Barium	39.9	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:03	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:03	7440-41-7	
Cadmium	0.044J	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:03	7440-43-9	
Chromium	0.25J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:03	7440-47-3	B
Cobalt	1.0J	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:03	7440-48-4	
Lead	0.10J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:03	7439-92-1	
Molybdenum	0.79J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:03	7439-98-7	B
Selenium	5.5	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:03	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:03	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 09:44	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	490	mg/L	5.0	5.0	1		06/26/17 07:55		
9040 pH		Analytical Method: EPA 9040							
pH	6.5	Std. Units	0.10	0.10	1		06/27/17 13:16		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	69.8	mg/L	5.0	2.5	5		06/26/17 15:23	16887-00-6	
Fluoride	0.26	mg/L	0.20	0.10	1		06/26/17 15:06	16984-48-8	
Sulfate	166	mg/L	20.0	10.0	20		06/26/17 15:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-302		Lab ID: 60247194002		Collected: 06/20/17 17:15		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/20/17 17:15		
Field pH	6.67	Std. Units	0.10	0.050	1		06/20/17 17:15		
Field Temperature	13.4	deg C	0.50	0.25	1		06/20/17 17:15		
Field Specific Conductance	2085	umhos/cm	1.0	1.0	1		06/20/17 17:15		
Field Oxidation Potential	21.0	mV			1		06/20/17 17:15		
Oxygen, Dissolved	0.12	mg/L			1		06/20/17 17:15	7782-44-7	
Turbidity	2.63	NTU	1.0	1.0	1		06/20/17 17:15		
Groundwater Elevation	655.65	feet			1		06/20/17 17:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1180	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:34	7440-42-8	
Calcium	175	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:34	7440-70-2	
Lithium	9.7J	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:34	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.052J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:07	7440-36-0	
Arsenic	0.083J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:07	7440-38-2	
Barium	18.2	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:07	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:07	7440-41-7	
Cadmium	0.19J	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:07	7440-43-9	
Chromium	0.58J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:07	7440-47-3	B
Cobalt	0.86J	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:07	7440-48-4	
Lead	0.081J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:07	7439-92-1	
Molybdenum	0.38J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:07	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:07	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:07	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 09:51	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1670	mg/L	5.0	5.0	1		06/26/17 07:55		
9040 pH		Analytical Method: EPA 9040							
pH	6.6	Std. Units	0.10	0.10	1		06/27/17 13:17		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	253	mg/L	20.0	10.0	20		06/26/17 16:11	16887-00-6	
Fluoride	0.26	mg/L	0.20	0.10	1		06/26/17 15:55	16984-48-8	
Sulfate	858	mg/L	100	50.0	100		06/26/17 16:27	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-303		Lab ID: 60247194003		Collected: 06/20/17 18:15		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/20/17 18:15		
Field pH	6.81	Std. Units	0.10	0.050	1		06/20/17 18:15		
Field Temperature	14.1	deg C	0.50	0.25	1		06/20/17 18:15		
Field Specific Conductance	1670	umhos/cm	1.0	1.0	1		06/20/17 18:15		
Field Oxidation Potential	8.6	mV			1		06/20/17 18:15		
Oxygen, Dissolved	0.08	mg/L			1		06/20/17 18:15	7782-44-7	
Turbidity	2.77	NTU	1.0	1.0	1		06/20/17 18:15		
Groundwater Elevation	652.42	feet			1		06/20/17 18:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	834	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:36	7440-42-8	
Calcium	210	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:36	7440-70-2	
Lithium	3.4J	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:36	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.19J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:11	7440-36-0	
Arsenic	0.33J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:11	7440-38-2	
Barium	76.4	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:11	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:11	7440-41-7	
Cadmium	0.52	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:11	7440-43-9	
Chromium	0.37J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:11	7440-47-3	B
Cobalt	1.9	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:11	7440-48-4	
Lead	0.070J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:11	7439-92-1	
Molybdenum	0.81J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:11	7439-98-7	B
Selenium	0.47J	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:11	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:11	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 09:53	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1210	mg/L	5.0	5.0	1		06/26/17 07:56		
9040 pH		Analytical Method: EPA 9040							
pH	6.8	Std. Units	0.10	0.10	1		06/27/17 13:19		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	186	mg/L	20.0	10.0	20		06/26/17 17:00	16887-00-6	
Fluoride	0.23	mg/L	0.20	0.10	1		06/26/17 16:44	16984-48-8	
Sulfate	284	mg/L	20.0	10.0	20		06/26/17 17:00	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-304		Lab ID: 60247194004		Collected: 06/21/17 08:45		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/21/17 08:45		
Field pH	7.29	Std. Units	0.10	0.050	1		06/21/17 08:45		
Field Temperature	13.3	deg C	0.50	0.25	1		06/21/17 08:45		
Field Specific Conductance	2029	umhos/cm	1.0	1.0	1		06/21/17 08:45		
Field Oxidation Potential	-66.6	mV			1		06/21/17 08:45		
Oxygen, Dissolved	0.10	mg/L			1		06/21/17 08:45	7782-44-7	
Turbidity	1.64	NTU	1.0	1.0	1		06/21/17 08:45		
Groundwater Elevation	654.75	feet			1		06/21/17 08:45		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	982	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:38	7440-42-8	
Calcium	126	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:38	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:38	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.060J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:16	7440-36-0	
Arsenic	0.57J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:16	7440-38-2	
Barium	87.1	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:16	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:16	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:16	7440-43-9	
Chromium	0.60J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:16	7440-47-3	B
Cobalt	0.36J	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:16	7440-48-4	
Lead	0.081J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:16	7439-92-1	
Molybdenum	1.5	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:16	7439-98-7	
Selenium	0.14J	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:16	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:16	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 09:55	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1240	mg/L	5.0	5.0	1		06/26/17 07:58		
9040 pH		Analytical Method: EPA 9040							
pH	7.2	Std. Units	0.10	0.10	1		06/29/17 13:00		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	382	mg/L	50.0	25.0	50		06/27/17 15:00	16887-00-6	
Fluoride	1.0	mg/L	0.20	0.10	1		06/26/17 17:16	16984-48-8	
Sulfate	254	mg/L	25.0	12.5	25		06/26/17 17:32	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-305		Lab ID: 60247194005		Collected: 06/21/17 13:00		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/21/17 13:00		
Field pH	7.06	Std. Units	0.10	0.050	1		06/21/17 13:00		
Field Temperature	13.3	deg C	0.50	0.25	1		06/21/17 13:00		
Field Specific Conductance	1730	umhos/cm	1.0	1.0	1		06/21/17 13:00		
Field Oxidation Potential	-4.5	mV			1		06/21/17 13:00		
Oxygen, Dissolved	0.06	mg/L			1		06/21/17 13:00	7782-44-7	
Turbidity	1.9	NTU	1.0	1.0	1		06/21/17 13:00		
Groundwater Elevation	661.26	feet			1		06/21/17 13:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	889	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:41	7440-42-8	
Calcium	93.8	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:41	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:41	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.12J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:20	7440-36-0	
Arsenic	0.37J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:20	7440-38-2	
Barium	110	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:20	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:20	7440-41-7	
Cadmium	0.039J	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:20	7440-43-9	
Chromium	0.22J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:20	7440-47-3	B
Cobalt	14.4	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:20	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:20	7439-92-1	
Molybdenum	5.8	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:20	7439-98-7	
Selenium	0.16J	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:20	7782-49-2	
Thallium	0.29J	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:20	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 09:57	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1010	mg/L	5.0	5.0	1		06/26/17 07:58		
9040 pH		Analytical Method: EPA 9040							
pH	7.1	Std. Units	0.10	0.10	1		06/27/17 13:30		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	290	mg/L	20.0	10.0	20		06/26/17 18:53	16887-00-6	
Fluoride	0.40	mg/L	0.20	0.10	1		06/26/17 18:20	16984-48-8	
Sulfate	121	mg/L	10.0	5.0	10		06/26/17 18:37	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-306		Lab ID: 60247194006		Collected: 06/21/17 12:15		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/21/17 12:15		
Field pH	6.71	Std. Units	0.10	0.050	1		06/21/17 12:15		
Field Temperature	13.4	deg C	0.50	0.25	1		06/21/17 12:15		
Field Specific Conductance	1151	umhos/cm	1.0	1.0	1		06/21/17 12:15		
Field Oxidation Potential	15.1	mV			1		06/21/17 12:15		
Oxygen, Dissolved	0.07	mg/L			1		06/21/17 12:15	7782-44-7	
Turbidity	0.14	NTU	1.0	1.0	1		06/21/17 12:15		
Groundwater Elevation	669.94	feet			1		06/21/17 12:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	784	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:48	7440-42-8	
Calcium	75.6	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:48	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:48	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.13J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:24	7440-36-0	
Arsenic	0.41J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:24	7440-38-2	
Barium	48.7	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:24	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:24	7440-41-7	
Cadmium	0.65	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:24	7440-43-9	
Chromium	0.57J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:24	7440-47-3	B
Cobalt	5.2	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:24	7440-48-4	
Lead	0.10J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:24	7439-92-1	
Molybdenum	4.6	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:24	7439-98-7	
Selenium	0.088J	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:24	7782-49-2	
Thallium	0.082J	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:24	7440-28-0	B
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:04	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	775	mg/L	5.0	5.0	1		06/26/17 07:59		
9040 pH		Analytical Method: EPA 9040							
pH	6.8	Std. Units	0.10	0.10	1		06/27/17 13:26		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	56.0	mg/L	5.0	2.5	5		06/26/17 19:25	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		06/26/17 19:09	16984-48-8	
Sulfate	282	mg/L	20.0	10.0	20		06/26/17 19:41	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-307 **Lab ID: 60247194007** Collected: 06/21/17 10:05 Received: 06/23/17 08:35 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		06/21/17 10:05		
Field pH	6.82	Std. Units	0.10	0.050	1		06/21/17 10:05		
Field Temperature	12.7	deg C	0.50	0.25	1		06/21/17 10:05		
Field Specific Conductance	1557	umhos/cm	1.0	1.0	1		06/21/17 10:05		
Field Oxidation Potential	-23.1	mV			1		06/21/17 10:05		
Oxygen, Dissolved	0.08	mg/L			1		06/21/17 10:05	7782-44-7	
Turbidity	34.94	NTU	1.0	1.0	1		06/21/17 10:05		
Groundwater Elevation	649.85	feet			1		06/21/17 10:05		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	197	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:50	7440-42-8	
Calcium	229	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:50	7440-70-2	
Lithium	11.2	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:50	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:29	7440-36-0	
Arsenic	0.62J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:29	7440-38-2	
Barium	132	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:29	7440-39-3	
Beryllium	0.016J	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:29	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:29	7440-43-9	
Chromium	1.0	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:29	7440-47-3	
Cobalt	1.1	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:29	7440-48-4	
Lead	0.26J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:29	7439-92-1	
Molybdenum	0.31J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:29	7439-98-7	B
Selenium	0.11J	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:29	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:29	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:06	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1070	mg/L	5.0	5.0	1		06/26/17 07:59		
9040 pH									
Analytical Method: EPA 9040									
pH	6.8	Std. Units	0.10	0.10	1		06/27/17 13:22		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	213	mg/L	20.0	10.0	20		06/26/17 20:30	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.10	1		06/26/17 19:58	16984-48-8	
Sulfate	110	mg/L	10.0	5.0	10		06/26/17 20:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-308 **Lab ID: 60247194008** Collected: 06/21/17 10:40 Received: 06/23/17 08:35 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		06/21/17 10:40		
Field pH	6.93	Std. Units	0.10	0.050	1		06/21/17 10:40		
Field Temperature	12.2	deg C	0.50	0.25	1		06/21/17 10:40		
Field Specific Conductance	1467	umhos/cm	1.0	1.0	1		06/21/17 10:40		
Field Oxidation Potential	-29.1	mV			1		06/21/17 10:40		
Oxygen, Dissolved	0.03	mg/L			1		06/21/17 10:40	7782-44-7	
Turbidity	0.84	NTU	1.0	1.0	1		06/21/17 10:40		
Groundwater Elevation	648.26	feet			1		06/21/17 10:40		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	182	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:52	7440-42-8	
Calcium	209	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:52	7440-70-2	
Lithium	12.7	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:52	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.039J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:33	7440-36-0	
Arsenic	0.14J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:33	7440-38-2	
Barium	125	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:33	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:33	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:33	7440-43-9	
Chromium	0.34J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:33	7440-47-3	B
Cobalt	0.25J	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:33	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:33	7439-92-1	
Molybdenum	0.50J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:33	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:33	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:33	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:08	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1050	mg/L	5.0	5.0	1		06/26/17 08:00		
9040 pH									
Analytical Method: EPA 9040									
pH	7.0	Std. Units	0.10	0.10	1		06/27/17 13:24		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	146	mg/L	20.0	10.0	20		06/26/17 20:46	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.10	1		06/26/17 22:07	16984-48-8	
Sulfate	303	mg/L	20.0	10.0	20		06/26/17 20:46	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: MW-309		Lab ID: 60247194009		Collected: 06/21/17 11:10		Received: 06/23/17 08:35		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/21/17 11:10		
Field pH	7.17	Std. Units	0.10	0.050	1		06/21/17 11:10		
Field Temperature	12.4	deg C	0.50	0.25	1		06/21/17 11:10		
Field Specific Conductance	1363	umhos/cm	1.0	1.0	1		06/21/17 11:10		
Field Oxidation Potential	-34.8	mV			1		06/21/17 11:10		
Oxygen, Dissolved	0.06	mg/L			1		06/21/17 11:10	7782-44-7	
Turbidity	20.33	NTU	1.0	1.0	1		06/21/17 11:10		
Groundwater Elevation	647.6	feet			1		06/21/17 11:10		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1250	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:55	7440-42-8	
Calcium	136	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:55	7440-70-2	
Lithium	7.3J	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:55	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.041J	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:37	7440-36-0	
Arsenic	0.52J	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:37	7440-38-2	
Barium	48.7	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:37	7440-39-3	
Beryllium	0.025J	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:37	7440-41-7	
Cadmium	0.033J	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:37	7440-43-9	
Chromium	1.8	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:37	7440-47-3	
Cobalt	2.4	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:37	7440-48-4	
Lead	0.50J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:37	7439-92-1	
Molybdenum	0.28J	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:37	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:37	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:37	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:10	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1020	mg/L	5.0	5.0	1		06/26/17 08:00		
9040 pH		Analytical Method: EPA 9040							
pH	7.2	Std. Units	0.10	0.10	1		06/27/17 13:25		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	75.5	mg/L	10.0	5.0	10		06/26/17 23:12	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.10	1		06/26/17 22:56	16984-48-8	
Sulfate	415	mg/L	50.0	25.0	50		06/26/17 23:28	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Sample: FIELD BLANK									
Lab ID: 60247194010 Collected: 06/21/17 12:30 Received: 06/23/17 08:35 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	4.8J	ug/L	100	3.5	1	06/28/17 17:00	06/29/17 18:57	7440-42-8	
Calcium	ND	mg/L	0.10	0.036	1	06/28/17 17:00	06/29/17 18:57	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	06/28/17 17:00	06/29/17 18:57	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	06/28/17 17:00	06/29/17 20:55	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	06/28/17 17:00	06/29/17 20:55	7440-38-2	
Barium	ND	ug/L	1.0	0.095	1	06/28/17 17:00	06/29/17 20:55	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/28/17 17:00	06/29/17 20:55	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/28/17 17:00	06/29/17 20:55	7440-43-9	
Chromium	0.46J	ug/L	1.0	0.054	1	06/28/17 17:00	06/29/17 20:55	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	06/28/17 17:00	06/29/17 20:55	7440-48-4	
Lead	0.051J	ug/L	1.0	0.033	1	06/28/17 17:00	06/29/17 20:55	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	06/28/17 17:00	06/29/17 20:55	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	06/28/17 17:00	06/29/17 20:55	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/28/17 17:00	06/29/17 20:55	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:13	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		06/26/17 08:01		
9040 pH Analytical Method: EPA 9040									
pH	6.7	Std. Units	0.10	0.10	1		06/27/17 13:29		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	ND	mg/L	1.0	0.50	1		06/26/17 14:02	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		06/26/17 14:02	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		06/26/17 14:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch: 483788 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010

METHOD BLANK: 1982091 Matrix: Water
 Associated Lab Samples: 60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.046	07/05/17 09:40	

LABORATORY CONTROL SAMPLE: 1982092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1982093 1982094

Parameter	Units	60247194001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	4.5	4.7	91	93	75-125	3	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch:	483129	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3010	Analysis Description:	6010 MET
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

METHOD BLANK:	1979036	Matrix:	Water
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	3.5	06/29/17 18:02	
Calcium	mg/L	ND	0.10	0.036	06/29/17 18:02	
Lithium	ug/L	ND	10.0	2.9	06/29/17 18:02	

LABORATORY CONTROL SAMPLE: 1979037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	958	96	80-120	
Calcium	mg/L	10	9.4	94	80-120	
Lithium	ug/L	1000	1080	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979038 1979039

Parameter	Units	60247077002		60247077003		60247077004		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Boron	ug/L	558	1000	1000	1530	1550	97	99	75-125	1	20
Calcium	mg/L	110	10	10	118	120	84	98	75-125	1	20
Lithium	ug/L	ND	1000	1000	1100	1100	110	110	75-125	0	20

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch:	483127	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3010	Analysis Description:	6020 MET
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

METHOD BLANK:	1979032	Matrix:	Water
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	06/29/17 19:06	
Arsenic	ug/L	ND	1.0	0.052	06/29/17 19:06	
Barium	ug/L	ND	1.0	0.095	06/29/17 19:06	
Beryllium	ug/L	ND	0.50	0.012	06/29/17 19:06	
Cadmium	ug/L	ND	0.50	0.018	06/29/17 19:06	
Chromium	ug/L	0.070J	1.0	0.054	06/29/17 19:06	
Cobalt	ug/L	ND	1.0	0.014	06/29/17 19:06	
Lead	ug/L	ND	1.0	0.033	06/29/17 19:06	
Molybdenum	ug/L	0.12J	1.0	0.058	06/29/17 19:06	
Selenium	ug/L	ND	1.0	0.086	06/29/17 19:06	
Thallium	ug/L	0.052J	1.0	0.036	06/29/17 19:06	

LABORATORY CONTROL SAMPLE: 1979033

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.9	95	80-120	
Arsenic	ug/L	40	37.9	95	80-120	
Barium	ug/L	40	38.9	97	80-120	
Beryllium	ug/L	40	39.1	98	80-120	
Cadmium	ug/L	40	38.3	96	80-120	
Chromium	ug/L	40	39.2	98	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	38.5	96	80-120	
Molybdenum	ug/L	40	40.4	101	80-120	
Selenium	ug/L	40	36.2	91	80-120	
Thallium	ug/L	40	37.0	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979034 1979035

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60247077003 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	ug/L	0.34J	40	40	36.9	37.2	91	92	75-125	1	20	
Arsenic	ug/L	2.5	40	40	38.0	38.8	89	91	75-125	2	20	
Barium	ug/L	214	40	40	254	250	98	90	75-125	1	20	
Beryllium	ug/L	ND	40	40	37.8	37.7	95	94	75-125	0	20	
Cadmium	ug/L	ND	40	40	35.7	35.6	89	89	75-125	0	20	
Chromium	ug/L	0.36J	40	40	39.1	38.4	97	95	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Parameter	Units	60247077003		1979034		1979035		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result								
Cobalt	ug/L	0.22J	40	40	37.1	37.3	92	93	75-125	1	20				
Lead	ug/L	0.085J	40	40	36.1	36.2	90	90	75-125	0	20				
Molybdenum	ug/L	15.9	40	40	56.6	56.0	102	100	75-125	1	20				
Selenium	ug/L	0.67J	40	40	33.6	33.5	82	82	75-125	0	20				
Thallium	ug/L	ND	40	40	35.5	35.4	89	88	75-125	1	20				

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch: 482462 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010

METHOD BLANK: 1976891 Matrix: Water
 Associated Lab Samples: 60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	06/26/17 07:51	

LABORATORY CONTROL SAMPLE: 1976892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	922	92	80-120	

SAMPLE DUPLICATE: 1976893

Parameter	Units	60247184001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3120	3110	0	10	

SAMPLE DUPLICATE: 1976894

Parameter	Units	60247195002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	656	636	3	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch:	482814	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

SAMPLE DUPLICATE: 1977920

Parameter	Units	60247195002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.6	7.7	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch: 483293 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60247194004

SAMPLE DUPLICATE: 1979775

Parameter	Units	60247194004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.2	7.2	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch:	482525	Analysis Method:	EPA 9056
QC Batch Method:	EPA 9056	Analysis Description:	9056 IC Anions
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

METHOD BLANK:	1977053	Matrix:	Water
Associated Lab Samples:	60247194001, 60247194002, 60247194003, 60247194004, 60247194005, 60247194006, 60247194007, 60247194008, 60247194009, 60247194010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	06/26/17 08:41	
Fluoride	mg/L	ND	0.20	0.10	06/26/17 08:41	
Sulfate	mg/L	ND	1.0	0.50	06/26/17 08:41	

LABORATORY CONTROL SAMPLE: 1977054

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	103	80-120	
Fluoride	mg/L	2.5	2.8	113	80-120	
Sulfate	mg/L	5	5.3	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1977055 1977056

Parameter	Units	60247194008		1977055		1977056		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chloride	mg/L	146	100	100	254	253	108	107	80-120	0	15
Fluoride	mg/L	0.12J	2.5	2.5	3.1	3.1	118	119	80-120	1	15

SAMPLE DUPLICATE: 1977057

Parameter	Units	60247195002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	8.0	8.0	0	15	
Fluoride	mg/L	1.1	1.1	3	15	
Sulfate	mg/L	79.3	78.1	2	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

QC Batch: 482672 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60247194004

METHOD BLANK: 1977449 Matrix: Water
 Associated Lab Samples: 60247194004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	06/27/17 07:26	

LABORATORY CONTROL SAMPLE: 1977450

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1977451 1977452

Parameter	Units	60247194004		1977451		1977452		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Chloride	mg/L	382	250	250	250	656	654	110	109	80-120	0	15

SAMPLE DUPLICATE: 1977453

Parameter	Units	60247195003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	12.8	29.9J			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247194001	MW-301		483794		
60247194002	MW-302		483794		
60247194003	MW-303		483794		
60247194004	MW-304		483794		
60247194005	MW-305		483794		
60247194006	MW-306		483794		
60247194007	MW-307		483794		
60247194008	MW-308		483794		
60247194009	MW-309		483794		
60247194001	MW-301	EPA 3010	483129	EPA 6010	483172
60247194002	MW-302	EPA 3010	483129	EPA 6010	483172
60247194003	MW-303	EPA 3010	483129	EPA 6010	483172
60247194004	MW-304	EPA 3010	483129	EPA 6010	483172
60247194005	MW-305	EPA 3010	483129	EPA 6010	483172
60247194006	MW-306	EPA 3010	483129	EPA 6010	483172
60247194007	MW-307	EPA 3010	483129	EPA 6010	483172
60247194008	MW-308	EPA 3010	483129	EPA 6010	483172
60247194009	MW-309	EPA 3010	483129	EPA 6010	483172
60247194010	FIELD BLANK	EPA 3010	483129	EPA 6010	483172
60247194001	MW-301	EPA 3010	483127	EPA 6020	483175
60247194002	MW-302	EPA 3010	483127	EPA 6020	483175
60247194003	MW-303	EPA 3010	483127	EPA 6020	483175
60247194004	MW-304	EPA 3010	483127	EPA 6020	483175
60247194005	MW-305	EPA 3010	483127	EPA 6020	483175
60247194006	MW-306	EPA 3010	483127	EPA 6020	483175
60247194007	MW-307	EPA 3010	483127	EPA 6020	483175
60247194008	MW-308	EPA 3010	483127	EPA 6020	483175
60247194009	MW-309	EPA 3010	483127	EPA 6020	483175
60247194010	FIELD BLANK	EPA 3010	483127	EPA 6020	483175
60247194001	MW-301	EPA 7470	483788	EPA 7470	483842
60247194002	MW-302	EPA 7470	483788	EPA 7470	483842
60247194003	MW-303	EPA 7470	483788	EPA 7470	483842
60247194004	MW-304	EPA 7470	483788	EPA 7470	483842
60247194005	MW-305	EPA 7470	483788	EPA 7470	483842
60247194006	MW-306	EPA 7470	483788	EPA 7470	483842
60247194007	MW-307	EPA 7470	483788	EPA 7470	483842
60247194008	MW-308	EPA 7470	483788	EPA 7470	483842
60247194009	MW-309	EPA 7470	483788	EPA 7470	483842
60247194010	FIELD BLANK	EPA 7470	483788	EPA 7470	483842
60247194001	MW-301	SM 2540C	482462		
60247194002	MW-302	SM 2540C	482462		
60247194003	MW-303	SM 2540C	482462		
60247194004	MW-304	SM 2540C	482462		
60247194005	MW-305	SM 2540C	482462		
60247194006	MW-306	SM 2540C	482462		
60247194007	MW-307	SM 2540C	482462		
60247194008	MW-308	SM 2540C	482462		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247194

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247194009	MW-309	SM 2540C	482462		
60247194010	FIELD BLANK	SM 2540C	482462		
60247194001	MW-301	EPA 9040	482814		
60247194002	MW-302	EPA 9040	482814		
60247194003	MW-303	EPA 9040	482814		
60247194004	MW-304	EPA 9040	483293		
60247194005	MW-305	EPA 9040	482814		
60247194006	MW-306	EPA 9040	482814		
60247194007	MW-307	EPA 9040	482814		
60247194008	MW-308	EPA 9040	482814		
60247194009	MW-309	EPA 9040	482814		
60247194010	FIELD BLANK	EPA 9040	482814		
60247194001	MW-301	EPA 9056	482525		
60247194002	MW-302	EPA 9056	482525		
60247194003	MW-303	EPA 9056	482525		
60247194004	MW-304	EPA 9056	482525		
60247194004	MW-304	EPA 9056	482672		
60247194005	MW-305	EPA 9056	482525		
60247194006	MW-306	EPA 9056	482525		
60247194007	MW-307	EPA 9056	482525		
60247194008	MW-308	EPA 9056	482525		
60247194009	MW-309	EPA 9056	482525		
60247194010	FIELD BLANK	EPA 9056	482525		

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Sample Condition Upon Receipt

WO#: 60247194



60247194

Client Name: SCS Eng

Courier: FedEx [X] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 7285 6593 2610; - 2600 Pace Shipping Label Used? Yes [] No [X]

Custody Seal on Cooler/Box Present: Yes [X] No [] Seals intact: Yes [X] No []

Packing Material: Bubble Wrap [X] Bubble Bags [] Foam [] None [] Other []

Thermometer Used: T-266 T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 2.0, 1.2 Corr. Factor CF +2.9 CF +0.2 Corrected 2.0, 1.4

Date and initials of person examining contents: JPD 01/23/17

Temperature should be above freezing to 6°C

Table with 2 columns: Question and Yes/No/N/A checkboxes. Rows include Chain of Custody, Short Hold Time analyses (<72hr), Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?, Filtered volume received for dissolved tests?, Sample labels match COC, Samples contain multiple phases?, Containers requiring pH preservation, Cyanide water sample checks, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, Additional labels attached to 5035A / TX1005 vials.

Client Notification/ Resolution: Copy COC to Client? Y / [N] Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature]

Date: 6-26-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS Engineers	Report To:	Meghan Blodgett	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive Madison WI 53718	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Address:	
Phone:	608-216-7362	Project Name:	Ottumwa Generating Station	Pace Quote Reference:	
Requested Due Date/TAT:		Project Number:	25216072	Pace Project Manager:	Trudy Gipson 913-563-1405

Page: _____ of _____

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DW DRINKING WATER WT WASTE WATER WP WASTE PRODUCT P PRODUCT SL SOIL/SOLID QL QUIL WP WIP AR AIR OT OTHER TS TISSUE	MATRIX CODE (see veld codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	PRESERVATIVES		Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				DATE	TIME		DATE	TIME	Y	N		
		WT	G	xxx	xxx	6/20/17	16:15			X	X	2024719A
		WT	G	xxx	xxx		17:15			X	X	202
		WT	G	xxx	xxx		18:15			X	X	203
		WT	G	xxx	xxx	6/21/17	8:45			X	X	204
		WT	G	xxx	xxx		13:00			X	X	205
		WT	G	xxx	xxx		12:15			X	X	206
		WT	G	xxx	xxx		10:05			X	X	207
		WT	G	xxx	xxx		16:40			X	X	208
		WT	G	xxx	xxx		11:10			X	X	209
		WT	G	xxx	xxx		12:30			X	X	210
	FIELD BLANK	WT	G	xxx	xxx							211
												212

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Paul A. Drotter	6/20/17	20:00	Jess Valcheff	6/21/17	08:35	Temp in °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
Ship To: 6608 Loiret Boulevard, Lenexa, KS 66219							2.0	Y	Y	Y
* Sb-As-Ba-Bi-Cd-Cr-Co-Pb-Mo-Se-Tl							1.4	Y	Y	Y
SAMPLER NAME AND SIGNATURE										
PRINT Name of SAMPLER:					DATE Signed (MM/DD/YYYY):					
SIGNATURE of SAMPLER:										

July 19, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen. Station/25216072
Pace Project No.: 60247197

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on June 23, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247197001	MW-301	Water	06/20/17 16:15	06/23/17 08:35
60247197002	MW-302	Water	06/20/17 17:15	06/23/17 08:35
60247197003	MW-303	Water	06/20/17 18:15	06/23/17 08:35
60247197004	MW-304	Water	06/21/17 08:45	06/23/17 08:35
60247197005	MW-305	Water	06/21/17 13:00	06/23/17 08:35
60247197006	MW-306	Water	06/21/17 12:15	06/23/17 08:35
60247197007	MW-307	Water	06/21/17 10:15	06/23/17 08:35
60247197008	MW-308	Water	06/21/17 10:40	06/23/17 08:35
60247197009	MW-309	Water	06/21/17 11:10	06/23/17 08:35
60247197010	FIELD BLANK	Water	06/21/17 12:30	06/23/17 08:35

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247197001	MW-301	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197002	MW-302	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197003	MW-303	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197004	MW-304	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197005	MW-305	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197006	MW-306	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197007	MW-307	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197008	MW-308	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197009	MW-309	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247197010	FIELD BLANK	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-301 **Lab ID: 60247197001** Collected: 06/20/17 16:15 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.501 ± 0.376 (0.194) C:NA T:80%	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	0.562 ± 0.408 (0.800) C:76% T:82%	pCi/L	07/13/17 15:55	15262-20-1	
Total Radium	Total Radium Calculation	1.06 ± 0.784 (0.994)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-302 **Lab ID: 60247197002** Collected: 06/20/17 17:15 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.130 ± 0.360 (0.698) C:NA T:90%	pCi/L	07/11/17 21:20	13982-63-3	
Radium-228	EPA 904.0	1.16 ± 0.514 (0.862) C:75% T:78%	pCi/L	07/13/17 15:55	15262-20-1	
Total Radium	Total Radium Calculation	1.29 ± 0.874 (1.56)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-303 **Lab ID: 60247197003** Collected: 06/20/17 18:15 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.556 ± 0.474 (0.665) C:NA T:93%	pCi/L	07/11/17 21:20	13982-63-3	
Radium-228	EPA 904.0	1.06 ± 0.422 (0.652) C:75% T:86%	pCi/L	07/14/17 14:58	15262-20-1	
Total Radium	Total Radium Calculation	1.62 ± 0.896 (1.32)	pCi/L	07/19/17 09:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-304 **Lab ID: 60247197004** Collected: 06/21/17 08:45 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.62 ± 0.688 (0.478) C:NA T:95%	pCi/L	07/11/17 21:20	13982-63-3	
Radium-228	EPA 904.0	1.93 ± 0.588 (0.765) C:75% T:87%	pCi/L	07/14/17 14:58	15262-20-1	
Total Radium	Total Radium Calculation	3.55 ± 1.28 (1.24)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-305 **Lab ID: 60247197005** Collected: 06/21/17 13:00 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.301 ± 0.468 (0.811) C:NA T:92%	pCi/L	07/10/17 11:34	13982-63-3	
Radium-228	EPA 904.0	0.695 ± 0.372 (0.667) C:78% T:86%	pCi/L	07/14/17 14:58	15262-20-1	
Total Radium	Total Radium Calculation	0.996 ± 0.840 (1.48)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-306 **Lab ID: 60247197006** Collected: 06/21/17 12:15 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.394 (0.802) C:NA T:76%	pCi/L	07/10/17 11:53	13982-63-3	
Radium-228	EPA 904.0	1.03 ± 0.404 (0.618) C:77% T:89%	pCi/L	07/14/17 14:58	15262-20-1	
Total Radium	Total Radium Calculation	1.03 ± 0.798 (1.42)	pCi/L	07/19/17 09:24	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-307 **Lab ID: 60247197007** Collected: 06/21/17 10:15 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.87 ± 0.868 (0.897) C:NA T:90%	pCi/L	07/10/17 11:53	13982-63-3	
Radium-228	EPA 904.0	0.960 ± 0.376 (0.572) C:78% T:93%	pCi/L	07/14/17 14:58	15262-20-1	
Total Radium	Total Radium Calculation	2.83 ± 1.24 (1.47)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-308 **Lab ID: 60247197008** Collected: 06/21/17 10:40 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.00 ± 0.959 (1.09) C:NA T:85%	pCi/L	07/10/17 11:53	13982-63-3	
Radium-228	EPA 904.0	1.30 ± 0.452 (0.618) C:76% T:84%	pCi/L	07/14/17 14:59	15262-20-1	
Total Radium	Total Radium Calculation	3.30 ± 1.41 (1.71)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: MW-309 **Lab ID: 60247197009** Collected: 06/21/17 11:10 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.37 ± 0.651 (0.206) C:NA T:86%	pCi/L	07/10/17 11:53	13982-63-3	
Radium-228	EPA 904.0	0.259 ± 0.273 (0.566) C:78% T:94%	pCi/L	07/14/17 14:59	15262-20-1	
Total Radium	Total Radium Calculation	1.63 ± 0.924 (0.772)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Sample: FIELD BLANK **Lab ID: 60247197010** Collected: 06/21/17 12:30 Received: 06/23/17 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.624 ± 0.489 (0.574) C:NA T:89%	pCi/L	07/10/17 11:53	13982-63-3	
Radium-228	EPA 904.0	0.604 ± 0.353 (0.636) C:78% T:77%	pCi/L	07/14/17 14:59	15262-20-1	
Total Radium	Total Radium Calculation	1.23 ± 0.842 (1.21)	pCi/L	07/19/17 09:24	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

QC Batch: 263924 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60247197005, 60247197006, 60247197007, 60247197008, 60247197009, 60247197010

METHOD BLANK: 1300365 Matrix: Water

Associated Lab Samples: 60247197005, 60247197006, 60247197007, 60247197008, 60247197009, 60247197010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.293 ± 0.353 (0.538) C:NA T:91%	pCi/L	07/10/17 11:00	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

QC Batch:	264363	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60247197003, 60247197004, 60247197005, 60247197006, 60247197007, 60247197008, 60247197009, 60247197010		

METHOD BLANK:	1302002	Matrix:	Water
Associated Lab Samples:	60247197003, 60247197004, 60247197005, 60247197006, 60247197007, 60247197008, 60247197009, 60247197010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	1.01 ± 0.458 (0.776) C:75% T:80%	pCi/L	07/14/17 14:58	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

QC Batch: 263771 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60247197001, 60247197002, 60247197003, 60247197004

METHOD BLANK: 1299245 Matrix: Water

Associated Lab Samples: 60247197001, 60247197002, 60247197003, 60247197004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.403 ± 0.377 (0.534) C:NA T:97%	pCi/L	07/11/17 20:29	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

QC Batch: 264361 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60247197001, 60247197002

METHOD BLANK: 1302000 Matrix: Water

Associated Lab Samples: 60247197001, 60247197002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.727 ± 0.367 (0.647) C:83% T:87%	pCi/L	07/13/17 11:35	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen. Station/25216072

Pace Project No.: 60247197

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247197001	MW-301	EPA 903.1	263771		
60247197002	MW-302	EPA 903.1	263771		
60247197003	MW-303	EPA 903.1	263771		
60247197004	MW-304	EPA 903.1	263771		
60247197005	MW-305	EPA 903.1	263924		
60247197006	MW-306	EPA 903.1	263924		
60247197007	MW-307	EPA 903.1	263924		
60247197008	MW-308	EPA 903.1	263924		
60247197009	MW-309	EPA 903.1	263924		
60247197010	FIELD BLANK	EPA 903.1	263924		
60247197001	MW-301	EPA 904.0	264361		
60247197002	MW-302	EPA 904.0	264361		
60247197003	MW-303	EPA 904.0	264363		
60247197004	MW-304	EPA 904.0	264363		
60247197005	MW-305	EPA 904.0	264363		
60247197006	MW-306	EPA 904.0	264363		
60247197007	MW-307	EPA 904.0	264363		
60247197008	MW-308	EPA 904.0	264363		
60247197009	MW-309	EPA 904.0	264363		
60247197010	FIELD BLANK	EPA 904.0	264363		
60247197001	MW-301	Total Radium Calculation	265473		
60247197002	MW-302	Total Radium Calculation	265473		
60247197003	MW-303	Total Radium Calculation	265473		
60247197004	MW-304	Total Radium Calculation	265473		
60247197005	MW-305	Total Radium Calculation	265473		
60247197006	MW-306	Total Radium Calculation	265473		
60247197007	MW-307	Total Radium Calculation	265473		
60247197008	MW-308	Total Radium Calculation	265473		
60247197009	MW-309	Total Radium Calculation	265473		
60247197010	FIELD BLANK	Total Radium Calculation	265473		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60247197



Client Name: SCS Eng.

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 7205 6593 2551; -2573 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 5.4, 4.0 Corr. Factor CF +2.9 CF +0.2 Corrected 5.6, 4.2

Date and initials of person examining contents: JS 6/23/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>wet</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 6-26-17



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Client Information: Company: SCS Engineers Address: 2830 Dairy Drive Madison WI 53718 Email To: mblodgett@scsengineers.com Phone: 608-216-7362 Requested Due Date/TAT: 08/00/2019		Section B Project Information: Report To: Meghan Blodgett Copy To: Tom Karwaski Purchase Order No.: Project Name: Oituma Generating Station Project Number: 25216072		Section C Invoice Information: Attention: Meghan Blodgett/Jess Valcheff Company Name: SCS Engineers Address: Pace Quote Reference: Pace Project Manager: Trudy Gipson 913-563-1405 Pace Profile #: 6696 Line 2	
REGULATORY AGENCY <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		Site Location STATE: IA			

Section D Required Client Information	Valid Matrix Codes	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	UNPRESERVED	PRESERVATIVES	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB							
MW-301	DRINKING WATER DW	WT G	G	6/22/17	6:15		2	H2SO4				001
MW-302	WASTE WATER WW	WT G	G	6/22/17	14:15		2	HNO3				002
MW-303	SOIL/SOLID	WT G	G	6/22/17	18:15		2	NaOH				003
MW-304	WASTE WATER WW	WT G	G	6/22/17	8:45		2	HCl				004
MW-305	WASTE WATER WW	WT G	G	6/22/17	13:00		2	H2SO4				005
MW-306	WASTE WATER WW	WT G	G	6/22/17	12:15		2	HNO3				006
MW-307	WASTE WATER WW	WT G	G	6/22/17	10:45		2	NaOH				007
MW-308	WASTE WATER WW	WT G	G	6/22/17	10:40		2	HCl				008
MW-309	WASTE WATER WW	WT G	G	6/22/17	11:10		2	HNO3				009
FIELD BLANK		WT G	G	6/22/17	12:30		2	Other				010

Section E ADDITIONAL COMMENTS Ship To: 8608 Loiret Boulevard, Lenexa, KS 66219 Relinquished By: Paul A. G... SCS Date: 6/22/17 20:00 Accepted By: [Signature] Date: 6/22/17 08:55 Time: 08:55 Date: 6/22/17 Time: 08:55 Received on Ice (Y/N): Y Custody Sealed (Y/N): Y Samples Intact (Y/N): Y
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER:

Chain of Custody



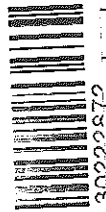
Workorder: 60247197 Subcontract To: Workorder Name: Ottumwa Gen. Station/25216072 Owner Received Date: 6/23/2017 Results Requested By: 7/19/2017

Trudy Gipson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone 1(913)563-1405

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone (724)850-5600

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	903.1 Radium-226	904.0 Radium-228	Total Radium	LAB USE ONLY
1	MW-301	PS	6/20/2017 16:15	60247197001	Water	2	X	X	X	001
2	MW-302	PS	6/20/2017 17:15	60247197002	Water	2	X	X	X	002
3	MW-303	PS	6/20/2017 18:15	60247197003	Water	2	X	X	X	003
4	MW-304	PS	6/21/2017 08:45	60247197004	Water	2	X	X	X	004
5	MW-305	PS	6/21/2017 13:00	60247197005	Water	2	X	X	X	005
6	MW-306	PS	6/21/2017 12:15	60247197006	Water	2	X	X	X	006
7	MW-307	PS	6/21/2017 10:15	60247197007	Water	2	X	X	X	007
8	MW-308	PS	6/21/2017 10:40	60247197008	Water	2	X	X	X	008
9	MW-309	PS	6/21/2017 11:10	60247197009	Water	2	X	X	X	009
10	FIELD BLANK	PS	6/21/2017 12:30	60247197010	Water	2	X	X	X	010

WO#: 30222872



Transfers	Released By	Date/Time	Received	Date/Time	Received on Ice	Y or N	Received on Ice	Y or N	Samples Intact	Y or N
1	[Signature]	6/26/17 17:00	[Signature]	6/28/17 10:15		N		N		N
2										
3										

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Sample Condition Upon Receipt Pittsburgh

30222872

AM



Client Name: PACE - KANSAS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 778565935193

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ZH 6/28/17

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:				3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:				5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:		/		
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Organic Samples checked for dechlorination:			/	13.
Filtered volume received for Dissolved tests			/	14.
All containers have been checked for preservation.	/			15.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed <u>ZH</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	16.
Trip Blank Present:			/	17.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed <u>ZH</u> Date: <u>6/28/17</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A4 Round 4 Background Sampling, Analytical Laboratory Report

September 07, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718


RE: Project: Ottumwa Gen Sta/25216072.17
Pace Project No.: 60251657

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Kyle Kramer, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60251657001	MW-301	Water	08/23/17 12:00	08/24/17 08:45
60251657002	MW-302	Water	08/22/17 16:55	08/24/17 08:45
60251657003	MW-303	Water	08/22/17 17:45	08/24/17 08:45
60251657004	MW-304	Water	08/22/17 19:00	08/24/17 08:45
60251657005	MW-305	Water	08/23/17 10:15	08/24/17 08:45
60251657006	MW-306	Water	08/23/17 11:05	08/24/17 08:45
60251657007	MW-307	Water	08/21/17 19:10	08/24/17 08:45
60251657008	MW-308	Water	08/21/17 18:15	08/24/17 08:45
60251657009	MW-309	Water	08/21/17 17:10	08/24/17 08:45
60251657010	FIELD BLANK	Water	08/23/17 11:05	08/24/17 08:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251657001	MW-301	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657002	MW-302	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657003	MW-303	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657004	MW-304	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657005	MW-305	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657006	MW-306	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657007	MW-307	EPA 6010	SMW	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251657008	MW-308	EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
		EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60251657009	MW-309	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
		EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
60251657010	FIELD BLANK	EPA 9056	OL	3	PASI-K
		EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	NSM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-301		Lab ID: 60251657001		Collected: 08/23/17 12:00		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/23/17 12:00		
Field pH	6.16	Std. Units	0.10	0.050	1		08/23/17 12:00		
Field Temperature	19.7	deg C	0.50	0.25	1		08/23/17 12:00		
Field Specific Conductance	1107	umhos/cm	1.0	1.0	1		08/23/17 12:00		
Field Oxidation Potential	41.4	mV			1		08/23/17 12:00		
Oxygen, Dissolved	2.88	mg/L			1		08/23/17 12:00	7782-44-7	
Turbidity	0.79	NTU	1.0	1.0	1		08/23/17 12:00		
Groundwater Elevation	681.28	feet			1		08/23/17 12:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	779	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 13:55	7440-42-8	
Calcium	66.8	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 13:55	7440-70-2	M1
Lithium	27.9	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 13:55	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.063J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:28	7440-36-0	
Arsenic	0.14J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:28	7440-38-2	
Barium	44.0	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:28	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:28	7440-41-7	
Cadmium	0.037J	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:28	7440-43-9	
Chromium	0.39J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:28	7440-47-3	B
Cobalt	0.96J	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:28	7440-48-4	
Lead	0.049J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:28	7439-92-1	
Molybdenum	1.3	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:28	7439-98-7	
Selenium	7.2	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:28	7782-49-2	
Thallium	0.067J	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:28	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:25	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	557	mg/L	5.0	5.0	1		08/28/17 16:48		
9040 pH		Analytical Method: EPA 9040							
pH	6.4	Std. Units	0.10	0.10	1		08/29/17 16:16		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	73.5	mg/L	5.0	2.5	5		09/02/17 12:29	16887-00-6	
Fluoride	0.34	mg/L	0.20	0.10	1		09/01/17 16:39	16984-48-8	
Sulfate	162	mg/L	20.0	10.0	20		09/02/17 12:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-302		Lab ID: 60251657002		Collected: 08/22/17 16:55		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/22/17 16:55		
Field pH	6.75	Std. Units	0.10	0.050	1		08/22/17 16:55		
Field Temperature	14.0	deg C	0.50	0.25	1		08/22/17 16:55		
Field Specific Conductance	2991	umhos/cm	1.0	1.0	1		08/22/17 16:55		
Field Oxidation Potential	20.8	mV			1		08/22/17 16:55		
Oxygen, Dissolved	0.08	mg/L			1		08/22/17 16:55	7782-44-7	
Turbidity	1.32	NTU	1.0	1.0	1		08/22/17 16:55		
Groundwater Elevation	655.13	feet			1		08/22/17 16:55		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1250	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:01	7440-42-8	
Calcium	179	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:01	7440-70-2	
Lithium	13.8	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:01	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.036J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:32	7440-36-0	
Arsenic	0.19J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:32	7440-38-2	
Barium	18.5	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:32	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:32	7440-41-7	
Cadmium	0.21J	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:32	7440-43-9	
Chromium	0.70J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:32	7440-47-3	B
Cobalt	0.88J	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:32	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:32	7439-92-1	
Molybdenum	0.51J	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:32	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:32	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:32	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:31	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1620	mg/L	5.0	5.0	1		08/26/17 15:30		
9040 pH		Analytical Method: EPA 9040							
pH	6.6	Std. Units	0.10	0.10	1		08/29/17 16:19		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	264	mg/L	20.0	10.0	20		09/02/17 13:01	16887-00-6	
Fluoride	0.27	mg/L	0.20	0.10	1		09/01/17 16:55	16984-48-8	
Sulfate	858	mg/L	100	50.0	100		09/02/17 13:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-303		Lab ID: 60251657003		Collected: 08/22/17 17:45		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/22/17 17:45		
Field pH	6.53	Std. Units	0.10	0.050	1		08/22/17 17:45		
Field Temperature	16.8	deg C	0.50	0.25	1		08/22/17 17:45		
Field Specific Conductance	2474	umhos/cm	1.0	1.0	1		08/22/17 17:45		
Field Oxidation Potential	20.9	mV			1		08/22/17 17:45		
Oxygen, Dissolved	0.08	mg/L			1		08/22/17 17:45	7782-44-7	
Turbidity	14.62	NTU	1.0	1.0	1		08/22/17 17:45		
Groundwater Elevation	650.58	feet			1		08/22/17 17:45		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1180	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:03	7440-42-8	
Calcium	200	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:03	7440-70-2	
Lithium	8.1J	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:03	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.30J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:45	7440-36-0	
Arsenic	0.61J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:45	7440-38-2	
Barium	83.8	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:45	7440-39-3	
Beryllium	0.015J	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:45	7440-41-7	
Cadmium	0.57	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:45	7440-43-9	
Chromium	0.61J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:45	7440-47-3	B
Cobalt	2.8	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:45	7440-48-4	
Lead	0.19J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:45	7439-92-1	
Molybdenum	0.64J	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:45	7439-98-7	B
Selenium	0.52J	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:45	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:45	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:34	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1220	mg/L	5.0	5.0	1		08/26/17 15:31		
9040 pH		Analytical Method: EPA 9040							
pH	6.8	Std. Units	0.10	0.10	1		08/29/17 16:21		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	268	mg/L	20.0	10.0	20		09/02/17 13:33	16887-00-6	
Fluoride	0.30	mg/L	0.20	0.10	1		09/01/17 17:11	16984-48-8	
Sulfate	215	mg/L	20.0	10.0	20		09/02/17 13:33	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-304		Lab ID: 60251657004		Collected: 08/22/17 19:00		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/22/17 19:00		
Field pH	6.72	Std. Units	0.10	0.050	1		08/22/17 19:00		
Field Temperature	13.4	deg C	0.50	0.25	1		08/22/17 19:00		
Field Specific Conductance	2881	umhos/cm	1.0	1.0	1		08/22/17 19:00		
Field Oxidation Potential	-10.1	mV			1		08/22/17 19:00		
Oxygen, Dissolved	0.08	mg/L			1		08/22/17 19:00	7782-44-7	
Turbidity	0.92	NTU	1.0	1.0	1		08/22/17 19:00		
Groundwater Elevation	652.39	feet			1		08/22/17 19:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1040	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:06	7440-42-8	
Calcium	130	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:06	7440-70-2	
Lithium	5.3J	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:06	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.035J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:49	7440-36-0	
Arsenic	0.67J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:49	7440-38-2	
Barium	91.5	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:49	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:49	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:49	7440-43-9	
Chromium	0.43J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:49	7440-47-3	B
Cobalt	0.30J	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:49	7440-48-4	
Lead	0.041J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:49	7439-92-1	
Molybdenum	1.6	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:49	7439-98-7	
Selenium	0.21J	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:49	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:49	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:36	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1250	mg/L	5.0	5.0	1		08/26/17 15:31		
9040 pH		Analytical Method: EPA 9040							
pH	7.0	Std. Units	0.10	0.10	1		08/29/17 16:22		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	409	mg/L	50.0	25.0	50		09/02/17 14:06	16887-00-6	
Fluoride	0.89	mg/L	0.20	0.10	1		09/01/17 17:59	16984-48-8	
Sulfate	194	mg/L	20.0	10.0	20		09/02/17 13:50	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-305		Lab ID: 60251657005		Collected: 08/23/17 10:15		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/23/17 10:15		
Field pH	6.88	Std. Units	0.10	0.050	1		08/23/17 10:15		
Field Temperature	13.3	deg C	0.50	0.25	1		08/23/17 10:15		
Field Specific Conductance	2422	umhos/cm	1.0	1.0	1		08/23/17 10:15		
Field Oxidation Potential	-51.3	mV			1		08/23/17 10:15		
Oxygen, Dissolved	0.12	mg/L			1		08/23/17 10:15	7782-44-7	
Turbidity	0.58	NTU	1.0	1.0	1		08/23/17 10:15		
Groundwater Elevation	659.00	feet			1		08/23/17 10:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	903	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:12	7440-42-8	
Calcium	95.8	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:12	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:12	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.12J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:53	7440-36-0	
Arsenic	0.51J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:53	7440-38-2	
Barium	114	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:53	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:53	7440-41-7	
Cadmium	0.034J	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:53	7440-43-9	
Chromium	0.45J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:53	7440-47-3	B
Cobalt	14.7	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:53	7440-48-4	
Lead	0.039J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:53	7439-92-1	
Molybdenum	6.0	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:53	7439-98-7	
Selenium	0.26J	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:53	7782-49-2	
Thallium	0.36J	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:53	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:38	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1040	mg/L	5.0	5.0	1		08/28/17 16:49		
9040 pH		Analytical Method: EPA 9040							
pH	7.1	Std. Units	0.10	0.10	1		08/29/17 16:23		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	295	mg/L	20.0	10.0	20		09/02/17 14:38	16887-00-6	
Fluoride	0.48	mg/L	0.20	0.10	1		09/01/17 18:16	16984-48-8	
Sulfate	124	mg/L	10.0	5.0	10		09/02/17 14:22	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-306		Lab ID: 60251657006		Collected: 08/23/17 11:05		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/23/17 11:05		
Field pH	6.46	Std. Units	0.10	0.050	1		08/23/17 11:05		
Field Temperature	13.2	deg C	0.50	0.25	1		08/23/17 11:05		
Field Specific Conductance	1576	umhos/cm	1.0	1.0	1		08/23/17 11:05		
Field Oxidation Potential	-10.5	mV			1		08/23/17 11:05		
Oxygen, Dissolved	0.08	mg/L			1		08/23/17 11:05	7782-44-7	
Turbidity	0.74	NTU	1.0	1.0	1		08/23/17 11:05		
Groundwater Elevation	668.77	feet			1		08/23/17 11:05		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	822	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:15	7440-42-8	
Calcium	73.9	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:15	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:15	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.10J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 16:58	7440-36-0	
Arsenic	0.38J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 16:58	7440-38-2	
Barium	47.4	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 16:58	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 16:58	7440-41-7	
Cadmium	0.72	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 16:58	7440-43-9	
Chromium	0.58J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 16:58	7440-47-3	B
Cobalt	5.0	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 16:58	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 16:58	7439-92-1	
Molybdenum	4.4	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 16:58	7439-98-7	
Selenium	0.13J	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 16:58	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 16:58	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:45	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	769	mg/L	5.0	5.0	1		08/28/17 16:49		
9040 pH		Analytical Method: EPA 9040							
pH	6.7	Std. Units	0.10	0.10	1		08/29/17 16:24		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	54.4	mg/L	5.0	2.5	5		09/02/17 14:54	16887-00-6	
Fluoride	0.15J	mg/L	0.20	0.10	1		09/01/17 18:32	16984-48-8	
Sulfate	264	mg/L	20.0	10.0	20		09/02/17 15:42	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-307 **Lab ID: 60251657007** Collected: 08/21/17 19:10 Received: 08/24/17 08:45 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		08/21/17 19:10		
Field pH	6.40	Std. Units	0.10	0.050	1		08/21/17 19:10		
Field Temperature	13.0	deg C	0.50	0.25	1		08/21/17 19:10		
Field Specific Conductance	2193	umhos/cm	1.0	1.0	1		08/21/17 19:10		
Field Oxidation Potential	23.7	mV			1		08/21/17 19:10		
Oxygen, Dissolved	0.08	mg/L			1		08/21/17 19:10	7782-44-7	
Turbidity	4.89	NTU	1.0	1.0	1		08/21/17 19:10		
Groundwater Elevation	645.78	feet			1		08/21/17 19:10		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	197	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:17	7440-42-8	
Calcium	221	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:17	7440-70-2	
Lithium	15.2	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:17	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 17:15	7440-36-0	
Arsenic	0.52J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 17:15	7440-38-2	
Barium	128	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 17:15	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 17:15	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 17:15	7440-43-9	
Chromium	0.38J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 17:15	7440-47-3	B
Cobalt	1.1	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 17:15	7440-48-4	
Lead	0.085J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 17:15	7439-92-1	
Molybdenum	0.31J	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 17:15	7439-98-7	B
Selenium	0.11J	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 17:15	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 17:15	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:47	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1050	mg/L	5.0	5.0	1		08/26/17 12:43		
9040 pH									
Analytical Method: EPA 9040									
pH	6.9	Std. Units	0.10	0.10	1		08/29/17 16:26		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	219	mg/L	20.0	10.0	20		09/02/17 16:15	16887-00-6	
Fluoride	0.20	mg/L	0.20	0.10	1		09/01/17 18:48	16984-48-8	
Sulfate	102	mg/L	10.0	5.0	10		09/02/17 15:58	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-308		Lab ID: 60251657008		Collected: 08/21/17 18:15		Received: 08/24/17 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		08/21/17 18:15		
Field pH	6.52	Std. Units	0.10	0.050	1		08/21/17 18:15		
Field Temperature	12.6	deg C	0.50	0.25	1		08/21/17 18:15		
Field Specific Conductance	2042	umhos/cm	1.0	1.0	1		08/21/17 18:15		
Field Oxidation Potential	24.4	mV			1		08/21/17 18:15		
Oxygen, Dissolved	0.12	mg/L			1		08/21/17 18:15	7782-44-7	
Turbidity	1.15	NTU	1.0	1.0	1		08/21/17 18:15		
Groundwater Elevation	643.12	feet			1		08/21/17 18:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	214	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:19	7440-42-8	
Calcium	218	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:19	7440-70-2	
Lithium	19.1	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:19	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 17:19	7440-36-0	
Arsenic	0.32J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 17:19	7440-38-2	
Barium	132	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 17:19	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 17:19	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 17:19	7440-43-9	
Chromium	0.49J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 17:19	7440-47-3	B
Cobalt	0.26J	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 17:19	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 17:19	7439-92-1	
Molybdenum	0.61J	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 17:19	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 17:19	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 17:19	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:49	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1020	mg/L	5.0	5.0	1		08/26/17 12:43		
9040 pH		Analytical Method: EPA 9040							
pH	6.9	Std. Units	0.10	0.10	1		08/29/17 16:27		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	151	mg/L	20.0	10.0	20		09/02/17 16:31	16887-00-6	
Fluoride	0.23	mg/L	0.20	0.10	1		09/01/17 19:04	16984-48-8	
Sulfate	294	mg/L	20.0	10.0	20		09/02/17 16:31	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: MW-309 Lab ID: 60251657009 Collected: 08/21/17 17:10 Received: 08/24/17 08:45 Matrix: Water

Parameters	Results	Units	Report			Prepared	Analyzed	CAS No.	Qual
			Limit	MDL	DF				
Field Data									
Analytical Method:									
Collected By	Client				1		08/21/17 17:10		
Field pH	6.90	Std. Units	0.10	0.050	1		08/21/17 17:10		
Field Temperature	12.6	deg C	0.50	0.25	1		08/21/17 17:10		
Field Specific Conductance	1821	umhos/cm	1.0	1.0	1		08/21/17 17:10		
Field Oxidation Potential	-5.0	mV			1		08/21/17 17:10		
Oxygen, Dissolved	0.08	mg/L			1		08/21/17 17:10	7782-44-7	
Turbidity	2.34	NTU	1.0	1.0	1		08/21/17 17:10		
Groundwater Elevation	641.82	feet			1		08/21/17 17:10		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1320	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 14:21	7440-42-8	
Calcium	135	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 14:21	7440-70-2	
Lithium	9.4J	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 14:21	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.029J	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 17:24	7440-36-0	
Arsenic	0.44J	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 17:24	7440-38-2	
Barium	46.1	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 17:24	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 17:24	7440-41-7	
Cadmium	0.018J	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 17:24	7440-43-9	
Chromium	1.2	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 17:24	7440-47-3	
Cobalt	2.1	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 17:24	7440-48-4	
Lead	0.096J	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 17:24	7439-92-1	
Molybdenum	0.28J	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 17:24	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 17:24	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 17:24	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:51	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1010	mg/L	5.0	5.0	1		08/26/17 12:44		
9040 pH									
Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		08/29/17 16:30		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	78.4	mg/L	5.0	2.5	5		09/02/17 17:03	16887-00-6	
Fluoride	0.19J	mg/L	0.20	0.10	1		09/01/17 19:20	16984-48-8	
Sulfate	395	mg/L	50.0	25.0	50		09/02/17 17:19	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Sample: FIELD BLANK									
Lab ID: 60251657010 Collected: 08/23/17 11:05 Received: 08/24/17 08:45 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	3.6J	ug/L	100	3.5	1	08/29/17 10:31	08/30/17 13:53	7440-42-8	B
Calcium	ND	mg/L	0.10	0.036	1	08/29/17 10:31	08/30/17 13:53	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	08/29/17 10:31	08/30/17 13:53	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	08/29/17 10:31	08/30/17 17:11	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	08/29/17 10:31	08/30/17 17:11	7440-38-2	
Barium	ND	ug/L	1.0	0.095	1	08/29/17 10:31	08/30/17 17:11	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/29/17 10:31	08/30/17 17:11	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/29/17 10:31	08/30/17 17:11	7440-43-9	
Chromium	0.28J	ug/L	1.0	0.054	1	08/29/17 10:31	08/30/17 17:11	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	08/29/17 10:31	08/30/17 17:11	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	08/29/17 10:31	08/30/17 17:11	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	08/29/17 10:31	08/30/17 17:11	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	08/29/17 10:31	08/30/17 17:11	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/29/17 10:31	08/30/17 17:11	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	09/01/17 16:30	09/05/17 10:54	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		08/28/17 16:50		
9040 pH Analytical Method: EPA 9040									
pH	5.7	Std. Units	0.10	0.10	1		08/29/17 16:32		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	0.62J	mg/L	1.0	0.50	1		09/01/17 19:36	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		09/01/17 19:36	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		09/01/17 19:36	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 492571 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007,
 60251657008, 60251657009, 60251657010

METHOD BLANK: 2015352 Matrix: Water
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007,
 60251657008, 60251657009, 60251657010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.046	09/05/17 10:21	

LABORATORY CONTROL SAMPLE: 2015353

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2015354 2015355

Parameter	Units	60251657001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	5.1	5.0	101	99	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 491855 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010

METHOD BLANK: 2013028 Matrix: Water
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	5.3J	100	3.5	08/30/17 13:50	
Calcium	mg/L	ND	0.10	0.036	08/30/17 13:50	
Lithium	ug/L	ND	10.0	2.9	08/30/17 13:50	

LABORATORY CONTROL SAMPLE: 2013029

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	80-120	
Calcium	mg/L	10	9.6	96	80-120	
Lithium	ug/L	1000	1060	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013030 2013031

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Boron	ug/L	1000	779	1000	1770	99	97	75-125	1	20	
Calcium	mg/L	10	66.8	10	75.0	82	59	75-125	3	20	M1
Lithium	ug/L	1000	27.9	1000	1090	106	105	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17
Pace Project No.: 60251657

QC Batch: 491857 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010

METHOD BLANK: 2013033 Matrix: Water
Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	08/30/17 16:19	
Arsenic	ug/L	ND	1.0	0.052	08/30/17 16:19	
Barium	ug/L	0.14J	1.0	0.095	08/30/17 16:19	
Beryllium	ug/L	ND	0.50	0.012	08/30/17 16:19	
Cadmium	ug/L	ND	0.50	0.018	08/30/17 16:19	
Chromium	ug/L	0.11J	1.0	0.054	08/30/17 16:19	
Cobalt	ug/L	ND	1.0	0.014	08/30/17 16:19	
Lead	ug/L	ND	1.0	0.033	08/30/17 16:19	
Molybdenum	ug/L	0.075J	1.0	0.058	08/30/17 16:19	
Selenium	ug/L	ND	1.0	0.086	08/30/17 16:19	
Thallium	ug/L	ND	1.0	0.036	08/30/17 16:19	

LABORATORY CONTROL SAMPLE: 2013034

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.2	95	80-120	
Arsenic	ug/L	40	38.8	97	80-120	
Barium	ug/L	40	38.3	96	80-120	
Beryllium	ug/L	40	38.5	96	80-120	
Cadmium	ug/L	40	38.9	97	80-120	
Chromium	ug/L	40	39.1	98	80-120	
Cobalt	ug/L	40	38.5	96	80-120	
Lead	ug/L	40	38.3	96	80-120	
Molybdenum	ug/L	40	38.9	97	80-120	
Selenium	ug/L	40	37.9	95	80-120	
Thallium	ug/L	40	37.9	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013035 2013036

Parameter	Units	60251657002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Antimony	ug/L	0.036J	40	40	36.1	37.2	90	93	75-125	3	20	
Arsenic	ug/L	0.19J	40	40	36.4	37.4	91	93	75-125	3	20	
Barium	ug/L	18.5	40	40	55.0	56.7	91	96	75-125	3	20	
Beryllium	ug/L	ND	40	40	29.9	30.9	75	77	75-125	3	20	
Cadmium	ug/L	0.21J	40	40	32.6	33.2	81	82	75-125	2	20	
Chromium	ug/L	0.70J	40	40	38.3	39.3	94	96	75-125	3	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Parameter	Units	2013035		2013036		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		60251657002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						MSD Result
Cobalt	ug/L	0.88J	40	40	36.2	36.8	88	90	75-125	2	20
Lead	ug/L	ND	40	40	35.1	36.6	88	91	75-125	4	20
Molybdenum	ug/L	0.51J	40	40	39.3	40.2	97	99	75-125	2	20
Selenium	ug/L	ND	40	40	33.3	34.8	83	87	75-125	4	20
Thallium	ug/L	ND	40	40	36.1	37.6	90	94	75-125	4	20

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 491616 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60251657007, 60251657008, 60251657009

METHOD BLANK: 2012339 Matrix: Water

Associated Lab Samples: 60251657007, 60251657008, 60251657009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	08/26/17 12:41	

LABORATORY CONTROL SAMPLE: 2012340

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	

SAMPLE DUPLICATE: 2012341

Parameter	Units	60251427001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	317	309	3	10	

SAMPLE DUPLICATE: 2012342

Parameter	Units	60251637005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2330	2340	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 491618 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60251657002, 60251657003, 60251657004

METHOD BLANK: 2012388 Matrix: Water

Associated Lab Samples: 60251657002, 60251657003, 60251657004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	08/26/17 15:28	

LABORATORY CONTROL SAMPLE: 2012389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	984	98	80-120	

SAMPLE DUPLICATE: 2012392

Parameter	Units	60251710001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	15700	16000	2	10	

SAMPLE DUPLICATE: 2012393

Parameter	Units	60251710004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	19000	19000	0	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 491860

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60251657001, 60251657005, 60251657006, 60251657010

METHOD BLANK: 2013046

Matrix: Water

Associated Lab Samples: 60251657001, 60251657005, 60251657006, 60251657010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	08/28/17 16:45	

LABORATORY CONTROL SAMPLE: 2013047

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 2013048

Parameter	Units	60251912001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2760	2790	1	10	

SAMPLE DUPLICATE: 2013049

Parameter	Units	60251863003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	984	999	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch:	492059	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
Associated Lab Samples:	60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010		

SAMPLE DUPLICATE: 2013642

Parameter	Units	60251657001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.4	6.4	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch:	492586	Analysis Method:	EPA 9056
QC Batch Method:	EPA 9056	Analysis Description:	9056 IC Anions
Associated Lab Samples:	60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010		

METHOD BLANK:	2015447	Matrix:	Water
Associated Lab Samples:	60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009, 60251657010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	09/01/17 14:46	
Fluoride	mg/L	ND	0.20	0.10	09/01/17 14:46	
Sulfate	mg/L	ND	1.0	0.50	09/01/17 14:46	

LABORATORY CONTROL SAMPLE: 2015448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Fluoride	mg/L	2.5	2.4	97	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

QC Batch: 492641 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009

METHOD BLANK: 2015834 Matrix: Water
 Associated Lab Samples: 60251657001, 60251657002, 60251657003, 60251657004, 60251657005, 60251657006, 60251657007, 60251657008, 60251657009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	09/02/17 09:12	
Sulfate	mg/L	ND	1.0	0.50	09/02/17 09:12	

LABORATORY CONTROL SAMPLE: 2015835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Sulfate	mg/L	5	5.0	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2015836 2015837

Parameter	Units	60251651008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	ND	5	5	6.0	5.6	101	93	80-120	6	15	

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251657001	MW-301		493234		
60251657002	MW-302		493234		
60251657003	MW-303		493234		
60251657004	MW-304		493234		
60251657005	MW-305		493234		
60251657006	MW-306		493234		
60251657007	MW-307		493234		
60251657008	MW-308		493234		
60251657009	MW-309		493234		
60251657001	MW-301	EPA 3010	491855	EPA 6010	492032
60251657002	MW-302	EPA 3010	491855	EPA 6010	492032
60251657003	MW-303	EPA 3010	491855	EPA 6010	492032
60251657004	MW-304	EPA 3010	491855	EPA 6010	492032
60251657005	MW-305	EPA 3010	491855	EPA 6010	492032
60251657006	MW-306	EPA 3010	491855	EPA 6010	492032
60251657007	MW-307	EPA 3010	491855	EPA 6010	492032
60251657008	MW-308	EPA 3010	491855	EPA 6010	492032
60251657009	MW-309	EPA 3010	491855	EPA 6010	492032
60251657010	FIELD BLANK	EPA 3010	491855	EPA 6010	492032
60251657001	MW-301	EPA 3010	491857	EPA 6020	492026
60251657002	MW-302	EPA 3010	491857	EPA 6020	492026
60251657003	MW-303	EPA 3010	491857	EPA 6020	492026
60251657004	MW-304	EPA 3010	491857	EPA 6020	492026
60251657005	MW-305	EPA 3010	491857	EPA 6020	492026
60251657006	MW-306	EPA 3010	491857	EPA 6020	492026
60251657007	MW-307	EPA 3010	491857	EPA 6020	492026
60251657008	MW-308	EPA 3010	491857	EPA 6020	492026
60251657009	MW-309	EPA 3010	491857	EPA 6020	492026
60251657010	FIELD BLANK	EPA 3010	491857	EPA 6020	492026
60251657001	MW-301	EPA 7470	492571	EPA 7470	492629
60251657002	MW-302	EPA 7470	492571	EPA 7470	492629
60251657003	MW-303	EPA 7470	492571	EPA 7470	492629
60251657004	MW-304	EPA 7470	492571	EPA 7470	492629
60251657005	MW-305	EPA 7470	492571	EPA 7470	492629
60251657006	MW-306	EPA 7470	492571	EPA 7470	492629
60251657007	MW-307	EPA 7470	492571	EPA 7470	492629
60251657008	MW-308	EPA 7470	492571	EPA 7470	492629
60251657009	MW-309	EPA 7470	492571	EPA 7470	492629
60251657010	FIELD BLANK	EPA 7470	492571	EPA 7470	492629
60251657001	MW-301	SM 2540C	491860		
60251657002	MW-302	SM 2540C	491618		
60251657003	MW-303	SM 2540C	491618		
60251657004	MW-304	SM 2540C	491618		
60251657005	MW-305	SM 2540C	491860		
60251657006	MW-306	SM 2540C	491860		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251657

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251657007	MW-307	SM 2540C	491616		
60251657008	MW-308	SM 2540C	491616		
60251657009	MW-309	SM 2540C	491616		
60251657010	FIELD BLANK	SM 2540C	491860		
60251657001	MW-301	EPA 9040	492059		
60251657002	MW-302	EPA 9040	492059		
60251657003	MW-303	EPA 9040	492059		
60251657004	MW-304	EPA 9040	492059		
60251657005	MW-305	EPA 9040	492059		
60251657006	MW-306	EPA 9040	492059		
60251657007	MW-307	EPA 9040	492059		
60251657008	MW-308	EPA 9040	492059		
60251657009	MW-309	EPA 9040	492059		
60251657010	FIELD BLANK	EPA 9040	492059		
60251657001	MW-301	EPA 9056	492586		
60251657001	MW-301	EPA 9056	492641		
60251657002	MW-302	EPA 9056	492586		
60251657002	MW-302	EPA 9056	492641		
60251657003	MW-303	EPA 9056	492586		
60251657003	MW-303	EPA 9056	492641		
60251657004	MW-304	EPA 9056	492586		
60251657004	MW-304	EPA 9056	492641		
60251657005	MW-305	EPA 9056	492586		
60251657005	MW-305	EPA 9056	492641		
60251657006	MW-306	EPA 9056	492586		
60251657006	MW-306	EPA 9056	492641		
60251657007	MW-307	EPA 9056	492586		
60251657007	MW-307	EPA 9056	492641		
60251657008	MW-308	EPA 9056	492586		
60251657008	MW-308	EPA 9056	492641		
60251657009	MW-309	EPA 9056	492586		
60251657009	MW-309	EPA 9056	492641		
60251657010	FIELD BLANK	EPA 9056	492586		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60251657



Client Name: SCS Eng.

Courier: FedEx [checked] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 8677 7489 2705 Pace Shipping Label Used? Yes [] No []

Custody Seal on Cooler/Box Present: Yes [checked] No [] Seals intact: Yes [checked] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [checked] Other []

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 3.4 Corr. Factor CF 0.0 CF +0.3 Corrected 3.4

Date and initials of person examining contents: JBS/24/17

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., pH, WT, N/A).

Client Notification/ Resolution: Copy COC to Client? Y / [checked] N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 8.24.17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information: Company: SCS Engineers, Address: 2830 Dairy Drive, Madison WI 53718, Email To: mbudgett@scsengineers.com, Phone: 608-216-7362, Fax: [blank], Requested Due Date/TA: 08/30/2019

Section B Required Project Information: Report To: Meghan Budgett, Copy To: Tom Karwaski, Purchase Order No: [blank], Project Name: Ootumwa Generating Station, Project Number: 25216072.17

Section C Invoicing Information: Attention: Meghan Budgett/Jess Vaichref, Company Name: SCS Engineers, Address: [blank], Face Quote Reference: Trudy Gipson 913-563-1405, Face Project Manager: [blank], Pace Profile #: 6596 Line 2

REGULATORY AGENCY NPDES GROUND WATER DRINKING WATER UST RCRA OTHER

Site Location STATE: IA

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT GROUNDWATER GL OIL WP AIR AR OTHER OT TISSUE TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	DATE	TIME	DATE	TIME	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS	
		COMPOSITE START	COMPOSITE END/GRAB														RELINQUISHED BY / AFFILIATION
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE Pace Project No./ Lab I.D.	MW-301	WT	G	8-23-17	12:00	197	2	2	2	2	2	2	2	2	2	2	2
	MW-302	WT	G	8-23-17	16:55	140	2	2	2	2	2	2	2	2	2	2	2
	MW-303	WT	G	8-23-17	17:45	168	2	2	2	2	2	2	2	2	2	2	2
	MW-304	WT	G	8-23-17	19:00	134	2	2	2	2	2	2	2	2	2	2	2
	MW-305	WT	G	8-23-17	10:15	133	2	2	2	2	2	2	2	2	2	2	2
	MW-306	WT	G	8-23-17	11:05	132	2	2	2	2	2	2	2	2	2	2	2
	MW-307	WT	G	8-23-17	19:10	127	2	2	2	2	2	2	2	2	2	2	2
	MW-308	WT	G	8-23-17	18:15	126	2	2	2	2	2	2	2	2	2	2	2
	MW-309	WT	G	8-23-17	17:10	121	2	2	2	2	2	2	2	2	2	2	2
	FIELD BLANK	WT	G	8-23-17	11:05	0	2	2	2	2	2	2	2	2	2	2	2

Requested Analysis Filtered (Y/N)

Preservatives: H₂SO₄, HNO₃, HCl, NaOH, Na₂S₂O₅, Methanol, Other

Analysis Test: 303.1 Radium-226, 304.0 Radium-228, Total Radium

Requested Analysis: 4010 Total Metals: 8-Co-Li-Z, 7970 Total Hg, 9056 Cl-F-Sulfur, 2590c TDS, 9690 Pb

Residual Chlorine (Y/N): [blank]

Temp °C: [blank]

Temp °F: [blank]

Refrigerated on Ice (Y/N): [blank]

Custody Sealed Cooler (Y/N): [blank]

Samples Intact (Y/N): [blank]

RELINQUISHED BY / AFFILIATION: Paul A. Brown SCS 8-23-17 11:50

ACCEPTED BY / AFFILIATION: [Signature] 8/24/17 0845

SAMPLER NAME AND SIGNATURE: [Signature]

PRINT Name of SAMPLER: [blank]

SIGNATURE of SAMPLER: [Signature]

DATE Signed (MM/DD/YY): [blank]

*Important Note: By signing this form you are accepting Face's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days. F-ALL-Q-020rev.07, 15-Feb-2007

September 19, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.17
Pace Project No.: 60251678

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Kyle Kramer, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60251678001	MW-301	Water	08/23/17 12:00	08/24/17 08:45
60251678002	MW-302	Water	08/22/17 16:55	08/24/17 08:45
60251678003	MW-303	Water	08/22/17 17:45	08/24/17 08:45
60251678004	MW-304	Water	08/22/17 19:00	08/24/17 08:45
60251678005	MW-305	Water	08/23/17 10:15	08/24/17 08:45
60251678006	MW-306	Water	08/23/17 11:05	08/24/17 08:45
60251678007	MW-307	Water	08/21/17 19:10	08/24/17 08:45
60251678008	MW-308	Water	08/21/17 18:15	08/24/17 08:45
60251678009	MW-309	Water	08/21/17 17:10	08/24/17 08:45
60251678010	FIELD BLANK	Water	08/23/17 11:05	08/24/17 08:45

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251678001	MW-301	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678002	MW-302	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678003	MW-303	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678004	MW-304	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678005	MW-305	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678006	MW-306	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678007	MW-307	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678008	MW-308	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678009	MW-309	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251678010	FIELD BLANK	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-301 **Lab ID: 60251678001** Collected: 08/23/17 12:00 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.123 ± 0.282 (0.454) C:NA T:89%	pCi/L	09/08/17 20:08	13982-63-3	
Radium-228	EPA 904.0	0.602 ± 0.404 (0.782) C:75% T:89%	pCi/L	09/12/17 11:55	15262-20-1	
Total Radium	Total Radium Calculation	0.725 ± 0.686 (1.24)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-302 **Lab ID: 60251678002** Collected: 08/22/17 16:55 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.406 ± 0.471 (0.760) C:NA T:90%	pCi/L	09/08/17 20:08	13982-63-3	
Radium-228	EPA 904.0	1.20 ± 0.524 (0.857) C:68% T:80%	pCi/L	09/12/17 11:55	15262-20-1	
Total Radium	Total Radium Calculation	1.61 ± 0.995 (1.62)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-303 **Lab ID: 60251678003** Collected: 08/22/17 17:45 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.40 ± 0.671 (0.617) C:NA T:81%	pCi/L	09/08/17 20:08	13982-63-3	
Radium-228	EPA 904.0	0.958 ± 0.445 (0.710) C:72% T:86%	pCi/L	09/12/17 18:07	15262-20-1	
Total Radium	Total Radium Calculation	2.36 ± 1.12 (1.33)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-304 **Lab ID: 60251678004** Collected: 08/22/17 19:00 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.20 ± 0.735 (0.929) C:NA T:77%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	2.00 ± 0.625 (0.782) C:75% T:90%	pCi/L	09/12/17 18:07	15262-20-1	
Total Radium	Total Radium Calculation	3.20 ± 1.36 (1.71)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-305 **Lab ID: 60251678005** Collected: 08/23/17 10:15 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.291 ± 0.471 (0.819) C:NA T:88%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	0.793 ± 0.429 (0.753) C:75% T:89%	pCi/L	09/12/17 18:07	15262-20-1	
Total Radium	Total Radium Calculation	1.08 ± 0.900 (1.57)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-306 **Lab ID: 60251678006** Collected: 08/23/17 11:05 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.517 ± 0.364 (0.175) C:NA T:82%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	0.784 ± 0.485 (0.882) C:74% T:70%	pCi/L	09/12/17 18:08	15262-20-1	
Total Radium	Total Radium Calculation	1.30 ± 0.849 (1.06)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-307 **Lab ID: 60251678007** Collected: 08/21/17 19:10 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.69 ± 0.666 (0.169) C:NA T:81%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	1.38 ± 0.509 (0.680) C:75% T:81%	pCi/L	09/12/17 18:08	15262-20-1	
Total Radium	Total Radium Calculation	3.07 ± 1.18 (0.849)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-308 **Lab ID: 60251678008** Collected: 08/21/17 18:15 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.42 ± 0.643 (0.192) C:NA T:75%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	0.745 ± 0.409 (0.715) C:75% T:87%	pCi/L	09/12/17 18:08	15262-20-1	
Total Radium	Total Radium Calculation	2.17 ± 1.05 (0.907)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: MW-309 **Lab ID: 60251678009** Collected: 08/21/17 17:10 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.783 ± 0.448 (0.411) C:NA T:87%	pCi/L	09/08/17 20:25	13982-63-3	
Radium-228	EPA 904.0	0.866 ± 0.435 (0.745) C:78% T:87%	pCi/L	09/12/17 18:08	15262-20-1	
Total Radium	Total Radium Calculation	1.65 ± 0.883 (1.16)	pCi/L	09/19/17 08:29	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Sample: FIELD BLANK **Lab ID: 60251678010** Collected: 08/23/17 11:05 Received: 08/24/17 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.246 ± 0.283 (0.167) C:NA T:86%	pCi/L	09/08/17 20:40	13982-63-3	
Radium-228	EPA 904.0	0.288 ± 0.497 (1.08) C:76% T:69%	pCi/L	09/12/17 18:08	15262-20-1	
Total Radium	Total Radium Calculation	0.534 ± 0.780 (1.25)	pCi/L	09/19/17 08:29	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

QC Batch:	270001	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60251678001, 60251678002, 60251678003, 60251678004, 60251678005, 60251678006, 60251678007, 60251678008, 60251678009, 60251678010		

METHOD BLANK:	1328689	Matrix:	Water
Associated Lab Samples:	60251678001, 60251678002, 60251678003, 60251678004, 60251678005, 60251678006, 60251678007, 60251678008, 60251678009, 60251678010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.116 ± 0.322 (0.624) C:NA T:87%	pCi/L	09/08/17 19:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

QC Batch:	270012	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60251678001, 60251678002, 60251678003, 60251678004, 60251678005, 60251678006, 60251678007, 60251678008, 60251678009, 60251678010		

METHOD BLANK:	1328714	Matrix:	Water
Associated Lab Samples:	60251678001, 60251678002, 60251678003, 60251678004, 60251678005, 60251678006, 60251678007, 60251678008, 60251678009, 60251678010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.790 ± 0.410 (0.733) C:79% T:84%	pCi/L	09/12/17 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60251678

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251678001	MW-301	EPA 903.1	270001		
60251678002	MW-302	EPA 903.1	270001		
60251678003	MW-303	EPA 903.1	270001		
60251678004	MW-304	EPA 903.1	270001		
60251678005	MW-305	EPA 903.1	270001		
60251678006	MW-306	EPA 903.1	270001		
60251678007	MW-307	EPA 903.1	270001		
60251678008	MW-308	EPA 903.1	270001		
60251678009	MW-309	EPA 903.1	270001		
60251678010	FIELD BLANK	EPA 903.1	270001		
60251678001	MW-301	EPA 904.0	270012		
60251678002	MW-302	EPA 904.0	270012		
60251678003	MW-303	EPA 904.0	270012		
60251678004	MW-304	EPA 904.0	270012		
60251678005	MW-305	EPA 904.0	270012		
60251678006	MW-306	EPA 904.0	270012		
60251678007	MW-307	EPA 904.0	270012		
60251678008	MW-308	EPA 904.0	270012		
60251678009	MW-309	EPA 904.0	270012		
60251678010	FIELD BLANK	EPA 904.0	270012		
60251678001	MW-301	Total Radium Calculation	272136		
60251678002	MW-302	Total Radium Calculation	272136		
60251678003	MW-303	Total Radium Calculation	272136		
60251678004	MW-304	Total Radium Calculation	272136		
60251678005	MW-305	Total Radium Calculation	272136		
60251678006	MW-306	Total Radium Calculation	272136		
60251678007	MW-307	Total Radium Calculation	272136		
60251678008	MW-308	Total Radium Calculation	272136		
60251678009	MW-309	Total Radium Calculation	272136		
60251678010	FIELD BLANK	Total Radium Calculation	272136		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60251678



Client Name: SCS

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 8106 8854 1777 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags BB 924 Foam None Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 14.6 Corr. Factor CF 0.0 / CF +0.3 Corrected 14.6

Date and initials of person examining contents: BB 8/24/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>wt</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Cyanide water sample checks: <input type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution: Copy COC to Client? Y N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 8-24-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Page: 1 of 1

Section C

Invoice Information:

Attention: **Meghan Blodgett/Jess Vaicheff**
 Company Name: SCS Engineers
 Address:
 Pace Quote Reference:
 Pace Project Manager:
 Pace Profile #: 6696 Line 2

Section B

Required Project Information:

Report To: **Meghan Blodgett**
 Copy To: **Tom Karwaski**
 Purchase Order No.:
 Project Name: **Ottumwa Generating Station**
 Project Number: 25216072.17

Section A

Client Information:

Company: **SCS Engineers**
 Address: **2830 Dairy Drive**
Madison WI 53718
 Email To: **mblodgett@scsengineers.com**
 Phone: **608-216-7362** Fax:
 Regulatory Agency: NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER
 Site Location: **IA**
 STATE: **IA**

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOILSOLID SL CIL CL WIPE WP AIR AR OTHER OT TISSUE TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP) (see valid codes to left)	MATRIX CODE	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		COMPOSITE START DATE TIME	COMPOSITE END/GRAB DATE TIME							
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE										
MW-301		WT G	8-23-17 12:00	WT G	WT	2				2896
MW-302		WT G	8-23-17 16:55	WT G	WT	2				01
MW-303		WT G	17:45	WT G	WT	2				02
MW-304		WT G	19:00	WT G	WT	2				03
MW-305		WT G	8-23-17 10:15	WT G	WT	2				04
MW-306		WT G	8-23-17 11:05	WT G	WT	2				05
MW-307		WT G	8-23-17 19:10	WT G	WT	2				06
MW-308		WT G	18:15	WT G	WT	2				07
MW-309		WT G	17:10	WT G	WT	2				08
FIELD BLANK		WT G	8-23-17 11:05	WT G	WT	2				09

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Paul A. Brown SCS	8-23-17	14:50	Paul A. Brown	8/23/17	14:50	

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

Chain of Custody



Workorder: 60251678 Workorder Name: Ottumwa Gen Sta/25216072.17 Owner Received Date: 8/24/2017 Results Requested By: 9/19/2017

Report To: Subcontract To: Requested Analysis

Trudy Gipson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone 1(913)563-1405

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone (724)850-5600

WO#: 30228486



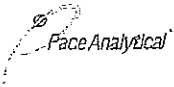
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers		903.1 Radium-226	904.0 Radium-228	Total Radium	LAB USE ONLY
						HNO3					
1	MW-301	PS	8/23/2017 12:00	60251678001	Water	2		X	X	X	001
2	MW-302	PS	8/22/2017 16:55	60251678002	Water	2		X	X	X	002
3	MW-303	PS	8/22/2017 17:45	60251678003	Water	2		X	X	X	003
4	MW-304	PS	8/22/2017 19:00	60251678004	Water	2		X	X	X	004
5	MW-305	PS	8/23/2017 10:15	60251678005	Water	2		X	X	X	005
6	MW-306	PS	8/23/2017 11:05	60251678006	Water	2		X	X	X	006
7	MW-307	PS	8/21/2017 19:10	60251678007	Water	2		X	X	X	007
8	MW-308	PS	8/21/2017 18:15	60251678008	Water	2		X	X	X	008
9	MW-309	PS	8/21/2017 17:10	60251678009	Water	2		X	X	X	009
10	FIELD BLANK	PS	8/23/2017 11:05	60251678010	Water	2		X	X	X	010

Transfers	Released By	Date/Time	Received	Date/Time	Comments
1	<i>[Signature]</i>	8/23/17 17:00	<i>[Signature]</i>	8/23/17 10:30	
2					
3					

Cooler Temperature on Receipt N/A °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt



30228486

Client Name: PACE, KS

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 778565961981

Label	<u>ZH</u>
LIMS Login	<u>ANW</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents:	<u>ZH 8/29/17</u>
---	-------------------

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16.
All containers needing preservation are found to be in compliance with EPA recommendation.	/			<u>PHLZ</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ZH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr	/			Initial when completed: <u>ZH</u> Date: <u>8/29/17</u>

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A5 Round 5 Background Sampling, Analytical Laboratory Report

November 22, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.17
Pace Project No.: 60257805

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on November 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Kyle Kramer, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60257805001	MW-301	Water	11/08/17 10:30	11/10/17 08:30
60257805002	MW-302	Water	11/08/17 11:15	11/10/17 08:30
60257805003	MW-303	Water	11/08/17 11:45	11/10/17 08:30
60257805004	MW-304	Water	11/08/17 12:40	11/10/17 08:30
60257805005	MW-305	Water	11/08/17 13:30	11/10/17 08:30
60257805006	MW-306	Water	11/08/17 13:55	11/10/17 08:30
60257805007	MW-307	Water	11/08/17 15:25	11/10/17 08:30
60257805008	MW-308	Water	11/08/17 16:00	11/10/17 08:30
60257805009	MW-309	Water	11/08/17 16:35	11/10/17 08:30
60257805010	FIELD BLANK	Water	11/08/17 14:45	11/10/17 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60257805001	MW-301	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805002	MW-302	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805003	MW-303	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805004	MW-304	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805005	MW-305	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805006	MW-306	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805007	MW-307	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805008	MW-308	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805009	MW-309	EPA 6010	TDS	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1, OL	3	PASI-K
60257805010	FIELD BLANK	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JRS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-301		Lab ID: 60257805001		Collected: 11/08/17 10:30		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 10:30		
Field pH	6.41	Std. Units	0.10	0.050	1		11/08/17 10:30		
Field Temperature	13.9	deg C	0.50	0.25	1		11/08/17 10:30		
Field Specific Conductance	743	umhos/cm	1.0	1.0	1		11/08/17 10:30		
Field Oxidation Potential	200.7	mV			1		11/08/17 10:30		
Oxygen, Dissolved	4.16	mg/L			1		11/08/17 10:30	7782-44-7	
Turbidity	1.03	NTU	1.0	1.0	1		11/08/17 10:30		
Groundwater Elevation	681.54	feet			1		11/08/17 10:30		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	488	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:49	7440-42-8	
Calcium	65.2	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:49	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	448	mg/L	5.0	5.0	1		11/15/17 15:29		
9040 pH		Analytical Method: EPA 9040							
pH	6.4	Std. Units	0.10	0.10	1		11/13/17 16:27		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	59.8	mg/L	5.0	2.5	5		11/21/17 17:49	16887-00-6	
Fluoride	0.27	mg/L	0.20	0.10	1		11/18/17 23:30	16984-48-8	
Sulfate	178	mg/L	20.0	10.0	20		11/21/17 18:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-302		Lab ID: 60257805002		Collected: 11/08/17 11:15		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 11:15		
Field pH	6.55	Std. Units	0.10	0.050	1		11/08/17 11:15		
Field Temperature	13.8	deg C	0.50	0.25	1		11/08/17 11:15		
Field Specific Conductance	2274	umhos/cm	1.0	1.0	1		11/08/17 11:15		
Field Oxidation Potential	191.7	mV			1		11/08/17 11:15		
Oxygen, Dissolved	0.40	mg/L			1		11/08/17 11:15	7782-44-7	
Turbidity	1.63	NTU	1.0	1.0	1		11/08/17 11:15		
Groundwater Elevation	655.40	feet			1		11/08/17 11:15		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1320	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:51	7440-42-8	
Calcium	183	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:51	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1620	mg/L	5.0	5.0	1		11/15/17 15:30		
9040 pH		Analytical Method: EPA 9040							
pH	6.5	Std. Units	0.10	0.10	1		11/13/17 16:29		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	254	mg/L	20.0	10.0	20		11/21/17 18:17	16887-00-6	
Fluoride	0.20J	mg/L	0.20	0.10	1		11/19/17 00:14	16984-48-8	
Sulfate	786	mg/L	100	50.0	100		11/21/17 19:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-303		Lab ID: 60257805003		Collected: 11/08/17 11:45		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 11:45		
Field pH	6.60	Std. Units	0.10	0.050	1		11/08/17 11:45		
Field Temperature	15.2	deg C	0.50	0.25	1		11/08/17 11:45		
Field Specific Conductance	1896	umhos/cm	1.0	1.0	1		11/08/17 11:45		
Field Oxidation Potential	176.8	mV			1		11/08/17 11:45		
Oxygen, Dissolved	0.48	mg/L			1		11/08/17 11:45	7782-44-7	
Turbidity	3.67	NTU	1.0	1.0	1		11/08/17 11:45		
Groundwater Elevation	651.34	feet			1		11/08/17 11:45		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1070	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:53	7440-42-8	
Calcium	234	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:53	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1290	mg/L	5.0	5.0	1		11/15/17 15:30		
9040 pH		Analytical Method: EPA 9040							
pH	6.7	Std. Units	0.10	0.10	1		11/13/17 16:30		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	185	mg/L	20.0	10.0	20		11/21/17 19:14	16887-00-6	
Fluoride	0.19J	mg/L	0.20	0.10	1		11/19/17 00:28	16984-48-8	
Sulfate	348	mg/L	20.0	10.0	20		11/21/17 19:14	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-304		Lab ID: 60257805004		Collected: 11/08/17 12:40		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 12:40		
Field pH	7.00	Std. Units	0.10	0.050	1		11/08/17 12:40		
Field Temperature	13.3	deg C	0.50	0.25	1		11/08/17 12:40		
Field Specific Conductance	2205	umhos/cm	1.0	1.0	1		11/08/17 12:40		
Field Oxidation Potential	162.7	mV			1		11/08/17 12:40		
Oxygen, Dissolved	0.25	mg/L			1		11/08/17 12:40	7782-44-7	
Turbidity	3.88	NTU	1.0	1.0	1		11/08/17 12:40		
Groundwater Elevation	653.03	feet			1		11/08/17 12:40		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1040	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:56	7440-42-8	
Calcium	136	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:56	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1270	mg/L	5.0	5.0	1		11/15/17 15:30		
9040 pH		Analytical Method: EPA 9040							
pH	6.9	Std. Units	0.10	0.10	1		11/13/17 16:31		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	417	mg/L	50.0	25.0	50		11/21/17 19:42	16887-00-6	
Fluoride	0.96	mg/L	0.20	0.10	1		11/19/17 00:42	16984-48-8	
Sulfate	194	mg/L	20.0	10.0	20		11/21/17 19:57	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-305		Lab ID: 60257805005		Collected: 11/08/17 13:30		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 13:30		
Field pH	7.01	Std. Units	0.10	0.050	1		11/08/17 13:30		
Field Temperature	13.2	deg C	0.50	0.25	1		11/08/17 13:30		
Field Specific Conductance	1738	umhos/cm	1.0	1.0	1		11/08/17 13:30		
Field Oxidation Potential	146.1	mV			1		11/08/17 13:30		
Oxygen, Dissolved	0.20	mg/L			1		11/08/17 13:30	7782-44-7	
Turbidity	2.68	NTU	1.0	1.0	1		11/08/17 13:30		
Groundwater Elevation	659.76	feet			1		11/08/17 13:30		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	925	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:58	7440-42-8	
Calcium	99.5	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:58	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1040	mg/L	5.0	5.0	1		11/15/17 15:30		
9040 pH		Analytical Method: EPA 9040							
pH	7.0	Std. Units	0.10	0.10	1		11/13/17 16:33		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	282	mg/L	20.0	10.0	20		11/21/17 20:11	16887-00-6	
Fluoride	0.40	mg/L	0.20	0.10	1		11/19/17 00:57	16984-48-8	
Sulfate	138	mg/L	10.0	5.0	10		11/21/17 20:25	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-306		Lab ID: 60257805006		Collected: 11/08/17 13:55		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 13:55		
Field pH	6.49	Std. Units	0.10	0.050	1		11/08/17 13:55		
Field Temperature	13.6	deg C	0.50	0.25	1		11/08/17 13:55		
Field Specific Conductance	1186	umhos/cm	1.0	1.0	1		11/08/17 13:55		
Field Oxidation Potential	174.1	mV			1		11/08/17 13:55		
Oxygen, Dissolved	0.18	mg/L			1		11/08/17 13:55	7782-44-7	
Turbidity	0.82	NTU	1.0	1.0	1		11/08/17 13:55		
Groundwater Elevation	669.04	feet			1		11/08/17 13:55		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	881	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 18:01	7440-42-8	
Calcium	73.1	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 18:01	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	773	mg/L	5.0	5.0	1		11/15/17 15:31		
9040 pH		Analytical Method: EPA 9040							
pH	6.5	Std. Units	0.10	0.10	1		11/13/17 16:35		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	50.4	mg/L	5.0	2.5	5		11/21/17 20:39	16887-00-6	
Fluoride	0.11J	mg/L	0.20	0.10	1		11/19/17 01:11	16984-48-8	
Sulfate	274	mg/L	20.0	10.0	20		11/21/17 20:53	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-307 Lab ID: 60257805007 Collected: 11/08/17 15:25 Received: 11/10/17 08:30 Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	Client				1		11/08/17 15:25		
Field pH	6.61	Std. Units	0.10	0.050	1		11/08/17 15:25		
Field Temperature	13.2	deg C	0.50	0.25	1		11/08/17 15:25		
Field Specific Conductance	1656	umhos/cm	1.0	1.0	1		11/08/17 15:25		
Field Oxidation Potential	176.7	mV			1		11/08/17 15:25		
Oxygen, Dissolved	0.17	mg/L			1		11/08/17 15:25	7782-44-7	
Turbidity	11.16	NTU	1.0	1.0	1		11/08/17 15:25		
Groundwater Elevation	647.37	feet			1		11/08/17 15:25		
6010 MET ICP Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	214	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 18:03	7440-42-8	
Calcium	227	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 18:03	7440-70-2	
Lithium	12.9	ug/L	10.0	2.9	1	11/15/17 10:20	11/15/17 18:03	7439-93-2	
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	ND	ug/L	1.0	0.026	1	11/15/17 10:20	11/19/17 11:27	7440-36-0	
Arsenic	0.54J	ug/L	1.0	0.052	1	11/15/17 10:20	11/19/17 11:27	7440-38-2	
Barium	131	ug/L	1.0	0.095	1	11/15/17 10:20	11/19/17 11:27	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	11/15/17 10:20	11/19/17 11:27	7440-41-7	
Cadmium	0.018J	ug/L	0.50	0.018	1	11/15/17 10:20	11/19/17 11:27	7440-43-9	
Chromium	0.38J	ug/L	1.0	0.054	1	11/15/17 10:20	11/19/17 11:27	7440-47-3	
Cobalt	1.3	ug/L	1.0	0.014	1	11/15/17 10:20	11/19/17 11:27	7440-48-4	
Lead	0.075J	ug/L	1.0	0.033	1	11/15/17 10:20	11/19/17 11:27	7439-92-1	
Molybdenum	0.37J	ug/L	1.0	0.058	1	11/15/17 10:20	11/19/17 11:27	7439-98-7	B
Selenium	0.13J	ug/L	1.0	0.086	1	11/15/17 10:20	11/19/17 11:27	7782-49-2	
Thallium	0.065J	ug/L	1.0	0.036	1	11/15/17 10:20	11/19/17 11:27	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	ND	ug/L	0.20	0.046	1	11/17/17 10:27	11/17/17 14:37	7439-97-6	
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1030	mg/L	5.0	5.0	1		11/15/17 15:31		
9040 pH Analytical Method: EPA 9040									
pH	7.0	Std. Units	0.10	0.10	1		11/14/17 16:48		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	217	mg/L	20.0	10.0	20		11/21/17 21:08	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.10	1		11/19/17 01:26	16984-48-8	
Sulfate	102	mg/L	10.0	5.0	10		11/21/17 21:50	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-308		Lab ID: 60257805008		Collected: 11/08/17 16:00	Received: 11/10/17 08:30	Matrix: Water				
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
Field Data		Analytical Method:								
Collected By	Client				1		11/08/17 16:00			
Field pH	6.76	Std. Units	0.10	0.050	1		11/08/17 16:00			
Field Temperature	13.0	deg C	0.50	0.25	1		11/08/17 16:00			
Field Specific Conductance	1577	umhos/cm	1.0	1.0	1		11/08/17 16:00			
Field Oxidation Potential	169.7	mV			1		11/08/17 16:00			
Oxygen, Dissolved	0.12	mg/L			1		11/08/17 16:00	7782-44-7		
Turbidity	0.73	NTU	1.0	1.0	1		11/08/17 16:00			
Groundwater Elevation	644.99	feet			1		11/08/17 16:00			
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	240	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 18:05	7440-42-8		
Calcium	212	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 18:05	7440-70-2		
Lithium	12.6	ug/L	10.0	2.9	1	11/15/17 10:20	11/15/17 18:05	7439-93-2		
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.026	1	11/15/17 10:20	11/19/17 11:51	7440-36-0		
Arsenic	0.32J	ug/L	1.0	0.052	1	11/15/17 10:20	11/19/17 11:51	7440-38-2		
Barium	133	ug/L	1.0	0.095	1	11/15/17 10:20	11/19/17 11:51	7440-39-3		
Beryllium	ND	ug/L	0.50	0.012	1	11/15/17 10:20	11/19/17 11:51	7440-41-7		
Cadmium	ND	ug/L	0.50	0.018	1	11/15/17 10:20	11/19/17 11:51	7440-43-9		
Chromium	0.45J	ug/L	1.0	0.054	1	11/15/17 10:20	11/19/17 11:51	7440-47-3		
Cobalt	0.23J	ug/L	1.0	0.014	1	11/15/17 10:20	11/19/17 11:51	7440-48-4		
Lead	ND	ug/L	1.0	0.033	1	11/15/17 10:20	11/19/17 11:51	7439-92-1		
Molybdenum	0.75J	ug/L	1.0	0.058	1	11/15/17 10:20	11/19/17 11:51	7439-98-7	B	
Selenium	ND	ug/L	1.0	0.086	1	11/15/17 10:20	11/19/17 11:51	7782-49-2		
Thallium	ND	ug/L	1.0	0.036	1	11/15/17 10:20	11/19/17 11:51	7440-28-0		
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.046	1	11/17/17 10:27	11/17/17 14:39	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C								
Total Dissolved Solids	1120	mg/L	5.0	5.0	1		11/15/17 15:32			
9040 pH		Analytical Method: EPA 9040								
pH	7.0	Std. Units	0.10	0.10	1		11/14/17 16:50		H6	
9056 IC Anions		Analytical Method: EPA 9056								
Chloride	156	mg/L	10.0	5.0	10		11/21/17 22:04	16887-00-6		
Fluoride	0.12J	mg/L	0.20	0.10	1		11/19/17 01:40	16984-48-8		
Sulfate	297	mg/L	20.0	10.0	20		11/21/17 22:19	14808-79-8		

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: MW-309		Lab ID: 60257805009		Collected: 11/08/17 16:35		Received: 11/10/17 08:30		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		11/08/17 16:35		
Field pH	7.11	Std. Units	0.10	0.050	1		11/08/17 16:35		
Field Temperature	13.1	deg C	0.50	0.25	1		11/08/17 16:35		
Field Specific Conductance	1431	umhos/cm	1.0	1.0	1		11/08/17 16:35		
Field Oxidation Potential	149.7	mV			1		11/08/17 16:35		
Oxygen, Dissolved	0.13	mg/L			1		11/08/17 16:35	7782-44-7	
Turbidity	3.71	NTU	1.0	1.0	1		11/08/17 16:35		
Groundwater Elevation	644.20	feet			1		11/08/17 16:35		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1360	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 18:08	7440-42-8	
Calcium	135	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 18:08	7440-70-2	
Lithium	6.9J	ug/L	10.0	2.9	1	11/15/17 10:20	11/15/17 18:08	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	11/15/17 10:20	11/19/17 12:11	7440-36-0	
Arsenic	0.45J	ug/L	1.0	0.052	1	11/15/17 10:20	11/19/17 12:11	7440-38-2	
Barium	46.0	ug/L	1.0	0.095	1	11/15/17 10:20	11/19/17 12:11	7440-39-3	
Beryllium	0.016J	ug/L	0.50	0.012	1	11/15/17 10:20	11/19/17 12:11	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	11/15/17 10:20	11/19/17 12:11	7440-43-9	
Chromium	1.2	ug/L	1.0	0.054	1	11/15/17 10:20	11/19/17 12:11	7440-47-3	
Cobalt	2.0	ug/L	1.0	0.014	1	11/15/17 10:20	11/19/17 12:11	7440-48-4	
Lead	0.057J	ug/L	1.0	0.033	1	11/15/17 10:20	11/19/17 12:11	7439-92-1	
Molybdenum	0.37J	ug/L	1.0	0.058	1	11/15/17 10:20	11/19/17 12:11	7439-98-7	B
Selenium	ND	ug/L	1.0	0.086	1	11/15/17 10:20	11/19/17 12:11	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	11/15/17 10:20	11/19/17 12:11	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	11/17/17 10:27	11/17/17 14:41	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1010	mg/L	5.0	5.0	1		11/15/17 15:32		
9040 pH		Analytical Method: EPA 9040							
pH	7.4	Std. Units	0.10	0.10	1		11/14/17 16:51		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	78.1	mg/L	5.0	2.5	5		11/21/17 22:33	16887-00-6	
Fluoride	0.14J	mg/L	0.20	0.10	1		11/19/17 01:54	16984-48-8	
Sulfate	402	mg/L	50.0	25.0	50		11/21/17 22:47	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Sample: FIELD BLANK									
Lab ID: 60257805010									
Collected: 11/08/17 14:45									
Received: 11/10/17 08:30									
Matrix: Water									
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	ND	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 18:10	7440-42-8	
Calcium	0.038J	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 18:10	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	11/15/17 10:20	11/15/17 18:10	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	0.026	1	11/15/17 10:20	11/19/17 12:07	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	11/15/17 10:20	11/19/17 12:07	7440-38-2	
Barium	ND	ug/L	1.0	0.095	1	11/15/17 10:20	11/19/17 12:07	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	11/15/17 10:20	11/19/17 12:07	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	11/15/17 10:20	11/19/17 12:07	7440-43-9	
Chromium	0.16J	ug/L	1.0	0.054	1	11/15/17 10:20	11/19/17 12:07	7440-47-3	
Cobalt	ND	ug/L	1.0	0.014	1	11/15/17 10:20	11/19/17 12:07	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	11/15/17 10:20	11/19/17 12:07	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	11/15/17 10:20	11/19/17 12:07	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	11/15/17 10:20	11/19/17 12:07	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	11/15/17 10:20	11/19/17 12:07	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.046	1	11/17/17 10:27	11/17/17 14:43	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	10.5	mg/L	5.0	5.0	1		11/15/17 15:33		
9040 pH		Analytical Method: EPA 9040							
pH	5.4	Std. Units	0.10	0.10	1		11/14/17 16:47		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	ND	mg/L	1.0	0.50	1		11/19/17 02:09	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		11/19/17 02:09	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		11/19/17 02:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 503615 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60257805007, 60257805008, 60257805009, 60257805010

METHOD BLANK: 2061781 Matrix: Water
 Associated Lab Samples: 60257805007, 60257805008, 60257805009, 60257805010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.046	11/17/17 14:32	

LABORATORY CONTROL SAMPLE: 2061782

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2061783 2061784

Parameter	Units	2061783		2061784		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60257854005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	ug/L	ND	5	5	4.9	5.0	97	99	75-125	2	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 503267 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010

METHOD BLANK: 2060296 Matrix: Water
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	3.5	11/15/17 17:23	
Calcium	mg/L	ND	0.10	0.036	11/15/17 17:23	
Lithium	ug/L	ND	10.0	2.9	11/15/17 17:23	

LABORATORY CONTROL SAMPLE: 2060297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	80-120	
Calcium	mg/L	10	10.0	100	80-120	
Lithium	ug/L	1000	1060	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060298 2060299

Parameter	Units	2060298		2060299		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60257718001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Boron	ug/L	1010	1000	1000	2030	2020	102	101	75-125	0	20
Calcium	mg/L	161	10	10	169	164	83	36	75-125	3	20 M1
Lithium	ug/L	111	1000	1000	1170	1180	106	107	75-125	1	20

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 503268 Analysis Method: EPA 6020
 QC Batch Method: EPA 3010 Analysis Description: 6020 MET
 Associated Lab Samples: 60257805007, 60257805008, 60257805009, 60257805010

METHOD BLANK: 2060304 Matrix: Water
 Associated Lab Samples: 60257805007, 60257805008, 60257805009, 60257805010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	11/19/17 11:19	
Arsenic	ug/L	ND	1.0	0.052	11/19/17 11:19	
Barium	ug/L	0.23J	1.0	0.095	11/19/17 11:19	
Beryllium	ug/L	ND	0.50	0.012	11/19/17 11:19	
Cadmium	ug/L	ND	0.50	0.018	11/19/17 11:19	
Chromium	ug/L	ND	1.0	0.054	11/19/17 11:19	
Cobalt	ug/L	ND	1.0	0.014	11/19/17 11:19	
Lead	ug/L	ND	1.0	0.033	11/19/17 11:19	
Molybdenum	ug/L	0.17J	1.0	0.058	11/19/17 11:19	
Selenium	ug/L	ND	1.0	0.086	11/19/17 11:19	
Thallium	ug/L	ND	1.0	0.036	11/19/17 11:19	

LABORATORY CONTROL SAMPLE: 2060305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.7	99	80-120	
Arsenic	ug/L	40	41.0	103	80-120	
Barium	ug/L	40	39.2	98	80-120	
Beryllium	ug/L	40	38.3	96	80-120	
Cadmium	ug/L	40	39.4	99	80-120	
Chromium	ug/L	40	39.9	100	80-120	
Cobalt	ug/L	40	39.4	98	80-120	
Lead	ug/L	40	38.2	96	80-120	
Molybdenum	ug/L	40	40.0	100	80-120	
Selenium	ug/L	40	39.7	99	80-120	
Thallium	ug/L	40	36.6	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060306 2060307

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60257805007 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	ug/L	ND	40	40	39.1	41.0	98	102	75-125	5	20	
Arsenic	ug/L	0.54J	40	40	39.9	41.0	98	101	75-125	3	20	
Barium	ug/L	131	40	40	169	173	96	104	75-125	2	20	
Beryllium	ug/L	ND	40	40	35.4	35.1	89	88	75-125	1	20	
Cadmium	ug/L	0.018J	40	40	36.8	37.8	92	95	75-125	3	20	
Chromium	ug/L	0.38J	40	40	39.6	39.2	98	97	75-125	1	20	
Cobalt	ug/L	1.3	40	40	37.9	38.5	91	93	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Parameter	Units	2060306		2060307		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60257805007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Lead	ug/L	0.075J	40	40	39.3	39.3	98	98	75-125	0	20		
Molybdenum	ug/L	0.37J	40	40	41.8	41.7	104	103	75-125	0	20		
Selenium	ug/L	0.13J	40	40	36.1	37.8	90	94	75-125	4	20		
Thallium	ug/L	0.065J	40	40	37.8	37.8	94	94	75-125	0	20		

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 503357 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010

METHOD BLANK: 2060704 Matrix: Water
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	11/15/17 15:21	

LABORATORY CONTROL SAMPLE: 2060705

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 2060706

Parameter	Units	60257763004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	853	871	2	10	

SAMPLE DUPLICATE: 2060707

Parameter	Units	60257805005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1040	1050	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 502970 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006

SAMPLE DUPLICATE: 2059184

Parameter	Units	60257524001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.9	7.0	1	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 503028 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60257805007, 60257805008, 60257805009, 60257805010

SAMPLE DUPLICATE: 2059465

Parameter	Units	60257584001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	8.0	8.0	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch:	503806	Analysis Method:	EPA 9056
QC Batch Method:	EPA 9056	Analysis Description:	9056 IC Anions
Associated Lab Samples:	60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010		

METHOD BLANK:	2062941	Matrix:	Water
Associated Lab Samples:	60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009, 60257805010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	11/18/17 20:23	
Fluoride	mg/L	ND	0.20	0.10	11/18/17 20:23	
Sulfate	mg/L	ND	1.0	0.50	11/18/17 20:23	

LABORATORY CONTROL SAMPLE: 2062942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.4	96	80-120	
Sulfate	mg/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2062943 2062944

Parameter	Units	60257718001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Fluoride	mg/L	0.77	2.5	2.5	3.3	3.4	101	106	80-120	4 15	

SAMPLE DUPLICATE: 2062945

Parameter	Units	60257718002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	7.8	7.8	0	15	
Fluoride	mg/L	1.2	1.0	15	15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

QC Batch: 504269 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009

METHOD BLANK: 2065478 Matrix: Water
 Associated Lab Samples: 60257805001, 60257805002, 60257805003, 60257805004, 60257805005, 60257805006, 60257805007, 60257805008, 60257805009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	11/21/17 14:02	
Sulfate	mg/L	ND	1.0	0.50	11/21/17 14:02	

LABORATORY CONTROL SAMPLE: 2065479

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2065480 2065481

Parameter	Units	60257718001		60257718002		MSD		MS		% Rec		Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec	Limits				
Chloride	mg/L	28.9	10	10	40.5	40.5	116	116	80-120	0	15		
Sulfate	mg/L	926	500	500	1430	1440	102	103	80-120	1	15		

SAMPLE DUPLICATE: 2065482

Parameter	Units	60257718002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	77.5	75.9	2	15	

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60257805001	MW-301		503906		
60257805002	MW-302		503906		
60257805003	MW-303		503906		
60257805004	MW-304		503906		
60257805005	MW-305		503906		
60257805006	MW-306		503906		
60257805007	MW-307		503906		
60257805008	MW-308		503906		
60257805009	MW-309		503906		
60257805001	MW-301	EPA 3010	503267	EPA 6010	503383
60257805002	MW-302	EPA 3010	503267	EPA 6010	503383
60257805003	MW-303	EPA 3010	503267	EPA 6010	503383
60257805004	MW-304	EPA 3010	503267	EPA 6010	503383
60257805005	MW-305	EPA 3010	503267	EPA 6010	503383
60257805006	MW-306	EPA 3010	503267	EPA 6010	503383
60257805007	MW-307	EPA 3010	503267	EPA 6010	503383
60257805008	MW-308	EPA 3010	503267	EPA 6010	503383
60257805009	MW-309	EPA 3010	503267	EPA 6010	503383
60257805010	FIELD BLANK	EPA 3010	503267	EPA 6010	503383
60257805007	MW-307	EPA 3010	503268	EPA 6020	503384
60257805008	MW-308	EPA 3010	503268	EPA 6020	503384
60257805009	MW-309	EPA 3010	503268	EPA 6020	503384
60257805010	FIELD BLANK	EPA 3010	503268	EPA 6020	503384
60257805007	MW-307	EPA 7470	503615	EPA 7470	503746
60257805008	MW-308	EPA 7470	503615	EPA 7470	503746
60257805009	MW-309	EPA 7470	503615	EPA 7470	503746
60257805010	FIELD BLANK	EPA 7470	503615	EPA 7470	503746
60257805001	MW-301	SM 2540C	503357		
60257805002	MW-302	SM 2540C	503357		
60257805003	MW-303	SM 2540C	503357		
60257805004	MW-304	SM 2540C	503357		
60257805005	MW-305	SM 2540C	503357		
60257805006	MW-306	SM 2540C	503357		
60257805007	MW-307	SM 2540C	503357		
60257805008	MW-308	SM 2540C	503357		
60257805009	MW-309	SM 2540C	503357		
60257805010	FIELD BLANK	SM 2540C	503357		
60257805001	MW-301	EPA 9040	502970		
60257805002	MW-302	EPA 9040	502970		
60257805003	MW-303	EPA 9040	502970		
60257805004	MW-304	EPA 9040	502970		
60257805005	MW-305	EPA 9040	502970		
60257805006	MW-306	EPA 9040	502970		
60257805007	MW-307	EPA 9040	503028		
60257805008	MW-308	EPA 9040	503028		
60257805009	MW-309	EPA 9040	503028		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257805

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60257805010	FIELD BLANK	EPA 9040	503028		
60257805001	MW-301	EPA 9056	503806		
60257805001	MW-301	EPA 9056	504269		
60257805002	MW-302	EPA 9056	503806		
60257805002	MW-302	EPA 9056	504269		
60257805003	MW-303	EPA 9056	503806		
60257805003	MW-303	EPA 9056	504269		
60257805004	MW-304	EPA 9056	503806		
60257805004	MW-304	EPA 9056	504269		
60257805005	MW-305	EPA 9056	503806		
60257805005	MW-305	EPA 9056	504269		
60257805006	MW-306	EPA 9056	503806		
60257805006	MW-306	EPA 9056	504269		
60257805007	MW-307	EPA 9056	503806		
60257805007	MW-307	EPA 9056	504269		
60257805008	MW-308	EPA 9056	503806		
60257805008	MW-308	EPA 9056	504269		
60257805009	MW-309	EPA 9056	503806		
60257805009	MW-309	EPA 9056	504269		
60257805010	FIELD BLANK	EPA 9056	503806		

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Sample Condition Upon Receipt

WO#: 60257805
Barcode
60257805

Client Name: SCS Engineers
Courier: FedEx [checked] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []
Tracking #: 72856597 9230 Pace Shipping Label Used? Yes [] No [checked]
Custody Seal on Cooler/Box Present: Yes [checked] No [] Seals intact: Yes [checked] No []
Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [checked] Other []
Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None
Cooler Temperature (°C): As-read 0.9 Corr. Factor CF 0.0 CF +0.2 Corrected 0.9

Date and initials of person examining contents: Rut 11-10-17

Temperature should be above freezing to 6°C

Table with 2 columns: Description and checkboxes. Rows include Chain of Custody present, Chain of Custody relinquished, Samples arrived within holding time, Short Hold Time analyses (<72hr), Rush Turn Around Time requested, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?, Filtered volume received for dissolved tests?, Sample labels match COC: Date / time / ID / analyses, Samples contain multiple phases? Matrix: WT, Containers requiring pH preservation in compliance?, Cyanide water sample checks: N/A, Lead acetate strip turns dark? (Record only), Potassium iodide test strip turns blue/purple? (Preserve), Trip Blank present, Headspace in VOA vials (>6mm), Samples from USDA Regulated Area: State, Additional labels attached to 5035A / TX1005 vials in the field?

Client Notification/ Resolution: Copy COC to Client? Y / [checked] N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Date: 11-13-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information: Company: SCS Engineers Address: 2830 Dairy Drive Madison WI 53718 Email To: mblodgett@scsengineers.com Phone: 608-216-7362 Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: Meghan Blodgett Copy To: Tom Kanwaski Purchase Order No.: Project Name: Oitumwa Generating Station Project Number: 25216072.17		Section C Invoice Information: Attention: Meghan Blodgett/Jess Valchreff Company Name: SCS Engineers Address: Pace Quote Reference: Pace Project Manager: Trudy Gipson 913-563-1405 Pace Profile #: 6696 Line 2		Page: _____ of _____ REGULATORY AGENCY <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER Site Location _____ STATE: IA	
Section D Required Client Information SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WW WASTE WATER WP PRODUCT P SOILSOLID S CIL CL WIFE WP AIR AR OTHER OT TISSUE TS		COLLECTED COMPOSITE START COMPOSITE END/GRAB		Requested Analysis Filtered (Y/N)	
MATRIX CODE (see valid codes to left) SAMPLE TYPE (G=GRAB C=COMP) DATE TIME SAMPLE TEMP AT COLLECTION		PRESERVATIVES H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other		Analysis Test 3010 Total Metals: B-Ca-Li 3020 Total Metals 7470 Total Hg 9056 Chloride-Fluoride-Sulfate 2540C TDS 3040 pH 3010 Total Metals: B-Ca		Pace Project No./ Lab I.D. Residual Chlorine (Y/N)	
MW-301 MW-302 MW-303 MW-304 MW-305 MW-306 MW-307 MW-308 MW-309 FIELD BLANK		DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME		Y/N Y/N Y/N Y/N Y/N Y/N Y/N Y/N Y/N		Pace Project No./ Lab I.D. B02U, BPSN 001 002 003 004 005 006 BPSN 21BPSN 007 008 009 010	
ADDITIONAL COMMENTS Ship To: 9608 Lorel Boulevard, Lenexa, KS 66219 * Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mn-Se-Tl		RELINQUISHED BY / AFFILIATION DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME		ACCEPTED BY / AFFILIATION DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME DATE TIME		SAMPLE CONDITIONS Received on Ice (Y/N) Custody Sealed (Y/N) Samples In tact (Y/N)	
11-13-17 JWA		Penta Lead SCS 11-9-17 16:30		11/10 6830 0.9 Y Y Y		Temp in °C	
SAMPLER NAME AND SIGNATURE		PRINT Name of SAMPLER: SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YYYY):		F-ALL-Q-020rev.07, 15-Feb-2007	

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

December 07, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.17
Pace Project No.: 60257815

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on November 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Kyle Kramer, SCS Engineers
Jeff Maxted, Alliant Energy



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60257815001	MW-307	Water	11/08/17 15:25	11/10/17 08:30
60257815002	MW-308	Water	11/08/17 16:00	11/10/17 08:30
60257815003	MW-309	Water	11/08/17 16:35	11/10/17 08:30
60257815004	FIELD BLANK	Water	11/08/17 14:45	11/10/17 08:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60257815001	MW-307	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60257815002	MW-308	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60257815003	MW-309	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60257815004	FIELD BLANK	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Sample: MW-307 **Lab ID: 60257815001** Collected: 11/08/17 15:25 Received: 11/10/17 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.76 ± 0.884 (1.03) C:NA T:87%	pCi/L	12/04/17 11:47	13982-63-3	
Radium-228	EPA 904.0	1.12 ± 0.485 (0.812) C:76% T:87%	pCi/L	12/01/17 11:20	15262-20-1	
Total Radium	Total Radium Calculation	2.88 ± 1.37 (1.84)	pCi/L	12/07/17 15:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Sample: MW-308 **Lab ID: 60257815002** Collected: 11/08/17 16:00 Received: 11/10/17 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.18 ± 0.719 (0.883) C:NA T:93%	pCi/L	12/04/17 12:04	13982-63-3	
Radium-228	EPA 904.0	0.286 ± 0.356 (0.754) C:75% T:85%	pCi/L	12/01/17 11:20	15262-20-1	
Total Radium	Total Radium Calculation	1.47 ± 1.08 (1.64)	pCi/L	12/07/17 15:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Sample: MW-309 **Lab ID: 60257815003** Collected: 11/08/17 16:35 Received: 11/10/17 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.284 ± 0.521 (0.929) C:NA T:89%	pCi/L	12/04/17 12:04	13982-63-3	
Radium-228	EPA 904.0	0.825 ± 0.401 (0.694) C:77% T:91%	pCi/L	12/01/17 11:21	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.922 (1.62)	pCi/L	12/07/17 15:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Sample: FIELD BLANK **Lab ID: 60257815004** Collected: 11/08/17 14:45 Received: 11/10/17 08:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.152 ± 0.516 (0.996) C:NA T:88%	pCi/L	12/04/17 12:04	13982-63-3	
Radium-228	EPA 904.0	0.234 ± 0.333 (0.714) C:74% T:83%	pCi/L	12/01/17 11:21	15262-20-1	
Total Radium	Total Radium Calculation	0.386 ± 0.849 (1.71)	pCi/L	12/07/17 15:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

QC Batch:	280046	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60257815001, 60257815002, 60257815003, 60257815004		

METHOD BLANK:	1375540	Matrix:	Water
Associated Lab Samples:	60257815001, 60257815002, 60257815003, 60257815004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0823 ± 0.297 (0.711) C:80% T:84%	pCi/L	12/01/17 11:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

QC Batch: 280260 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60257815001, 60257815002, 60257815003, 60257815004

METHOD BLANK: 1376383 Matrix: Water

Associated Lab Samples: 60257815001, 60257815002, 60257815003, 60257815004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.080 ± 0.364 (0.741) C:NA T:92%	pCi/L	12/04/17 11:47	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.17

Pace Project No.: 60257815

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60257815001	MW-307	EPA 903.1	280260		
60257815002	MW-308	EPA 903.1	280260		
60257815003	MW-309	EPA 903.1	280260		
60257815004	FIELD BLANK	EPA 903.1	280260		
60257815001	MW-307	EPA 904.0	280046		
60257815002	MW-308	EPA 904.0	280046		
60257815003	MW-309	EPA 904.0	280046		
60257815004	FIELD BLANK	EPA 904.0	280046		
60257815001	MW-307	Total Radium Calculation	281587		
60257815002	MW-308	Total Radium Calculation	281587		
60257815003	MW-309	Total Radium Calculation	281587		
60257815004	FIELD BLANK	Total Radium Calculation	281587		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60257815



Client Name: SCS Engineers

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 728565979089 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 7.9 Corr. Factor CF 0.0 / CF +0.2 Corrected 7.9

RA 11-10-17
Date and initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Client Notification/ Resolution: Copy COC to Client? Y / Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 11-13-17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A
Required Client Information:
 Company: SCS Engineers
 Address: 2830 Dairy Drive
 Madison WI 53718
 Email To: mblodgett@scsengineers.com
 Phone: 608-216-7362 Fax:
 Project Name: Ottumwa Generating Station
 Project Number: 25216072.17
 Requested Due Date/TAT:

Section B
Required Project Information:
 Report To: Meghan Blodgett
 Copy To: Tom Karwaski
 Purchase Order No.:
 Project Name: Ottumwa Generating Station
 Project Number: 25216072.17

Section C
Invoice Information
 Attention: Meghan Blodgett/Jess Vatcheff
 Company Name: SCS Engineers
 Address:
 Pace Quote Reference:
 Pace Project Manager: Trudy Gipson 913-563-1405
 Pace Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location: IA
 STATE: IA

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW FRODOCT F SOIL/SOLID SL OIL CL WIPE WP AIR AR OTHER OT TISSUE TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
		COMPOSITE START	COMPOSITE END/SUB						
DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
MW-307	WT	xxx	xxx	11-8-17	15:25	2		Y	
MW-308	WT	xxx	xxx	16:00	130	2		N	
MW-309	WT	xxx	xxx	16:35	130	2		N	
FIELD BLANK	WT	xxx	xxx	14:45	-	2		N	

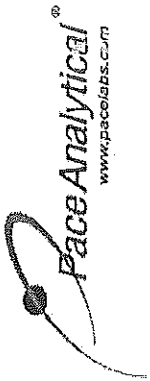
Handwritten notes:
 MW-307: 6696-7-815
 MW-308: BPIN AP# 113-17
 MW-309: Pace Project No./ Lab I.D.
 MW-309: BPIN 001
 MW-309: 002
 MW-309: 003
 MW-309: 004

ADDITIONAL COMMENTS
 Relinquished by / Affiliation: Paul A. Gandy SCS
 Date: 11-4-17
 Time: 16:30
 Accepted by / Affiliation: [Signature]
 Date: 11/10
 Time: 0830
 Sample Conditions: Z, N, Y, M

Temp in °C: _____
 Received on Ice (Y/N): _____
 Custody Sealed Cooler (Y/N): _____
 Samples Intact (Y/N): _____

SAMPLER NAME AND SIGNATURE: _____
 PRINT Name of SAMPLER: _____
 SIGNATURE of SAMPLER: _____
 DATE Signed (MM/DD/YY): _____

Chain of Custody



Workorder: 60257815 Workorder Name: Ottumwa Gen Sta/25216072.17 Owner Received Date: 11/10/2017 Results Requested By: 12/7/2017

Report To: Subcontract To: Requested Analysis:

Trudy Gipson
Pace Analytical Kansas
9608 Loiret Blvd.
Lenexa, KS 66219
Phone 1(913)563-1405

Pace Analytical Pittsburgh
1638 Roseytown Road
Suites 2,3, & 4
Greensburg, PA 15601
Phone (724)850-5600

WO#: 30236798
30236798

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Total Radium	LAB USE ONLY
						903.1 Radium-226	904.0 Radium-228				
1	MW-307	PS	11/8/2017 15:25	60257815001	Water	2	X	X	X		001
2	MW-308	PS	11/8/2017 16:00	60257815002	Water	2	X	X	X		002
3	MW-309	PS	11/8/2017 16:35	60257815003	Water	2	X	X	X		003
4	FIELD BLANK	PS	11/8/2017 14:45	60257815004	Water	2	X	X	X		004

Transfers	Released By	Date/Time	Received	Date/Time	Received on Ice	Y or N	Samples Intact	Y or N
1	<i>[Signature]</i>	11/20/17	<i>[Signature]</i>	11/21/17		N		N
2								
3								

Cooler Temperature on Receipt: N/A °C Custody Seal: Y or N Received on Ice: Y or N Samples Intact: Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory. Monday, November 13, 2017 11:07:03

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: Pace KS

Project # 30236798

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Label ZH
LIMS Login ANU

Tracking #: 4122493991A

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Date and initials of person examining contents: ZH 11/21/17

Comments:	Yes	No	N/A	
Chain of Custody Present:	/			1.
Chain of Custody Filled Out:	/			2.
Chain of Custody Relinquished:	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. <u>PHCZ</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed <u>ZH</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>ZH</u> Date: <u>11/21/17</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A6 Round 6 Background Sampling, Analytical Laboratory Reports

January 22, 2019

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.18 2
Pace Project No.: 60274197

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Arkansas Drinking Water

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60268626007	MW-307	Water	04/16/18 20:55	04/20/18 08:45
60268626008	MW-308	Water	04/16/18 17:40	04/20/18 08:45
60268626009	MW-309	Water	04/16/18 19:55	04/20/18 08:45
60268626001	MW-301	Water	04/18/18 10:15	04/20/18 08:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60268626007	MW-307	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB	3	PASI-K
60268626008	MW-308	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB	3	PASI-K
60268626009	MW-309	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB	3	PASI-K
60268626001	MW-301	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Sample: MW-307 **Lab ID: 60268626007** Collected: 04/16/18 20:55 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	CLIENT				1		04/16/18 20:55		
Field pH	7.04	Std. Units	0.10	0.050	1		04/16/18 20:55		
Field Temperature	11.6	deg C	0.50	0.25	1		04/16/18 20:55		
Field Specific Conductance	1674	umhos/cm	1.0	1.0	1		04/16/18 20:55		
Field Oxidation Potential	-105.9	mV			1		04/16/18 20:55		
Oxygen, Dissolved	0.29	mg/L			1		04/16/18 20:55	7782-44-7	
Turbidity	11.93	NTU	1.0	1.0	1		04/16/18 20:55		
Groundwater Elevation	649.66	feet			1		04/16/18 20:55		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	200	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 21:03	7440-42-8	
Calcium	220	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 21:03	7440-70-2	
Lithium	9.3J	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 21:03	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.026	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:45	7440-36-0	
Arsenic	0.41J	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:45	7440-38-2	
Barium	126	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:45	7440-39-3	
Beryllium	<0.012	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 15:48	7440-41-7	
Cadmium	<0.018	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:45	7440-43-9	
Chromium	0.28J	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:45	7440-47-3	
Cobalt	1.3	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:45	7440-48-4	
Lead	0.13J	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:45	7439-92-1	
Molybdenum	0.30J	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 13:38	7439-98-7	B
Selenium	<0.086	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:45	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:45	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/25/18 16:05	04/26/18 11:20	7439-97-6	
9040 pH									
Analytical Method: EPA 9040									
pH	7.1	Std. Units	0.10	0.10	1		05/01/18 16:59		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	224	mg/L	20.0	9.2	20		04/30/18 01:28	16887-00-6	
Fluoride	0.11J	mg/L	0.20	0.063	1		04/28/18 10:22	16984-48-8	
Sulfate	103	mg/L	10.0	2.4	10		04/28/18 11:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Sample: MW-308 **Lab ID: 60268626008** Collected: 04/16/18 17:40 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	CLIENT				1		04/16/18 17:40		
Field pH	7.14	Std. Units	0.10	0.050	1		04/16/18 17:40		
Field Temperature	11.8	deg C	0.50	0.25	1		04/16/18 17:40		
Field Specific Conductance	1577	umhos/cm	1.0	1.0	1		04/16/18 17:40		
Field Oxidation Potential	-47.2	mV			1		04/16/18 17:40		
Oxygen, Dissolved	0.35	mg/L			1		04/16/18 17:40	7782-44-7	
Turbidity	0.93	NTU	1.0	1.0	1		04/16/18 17:40		
Groundwater Elevation	647.91	feet			1		04/16/18 17:40		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	210	ug/L	100	12.5	1	04/27/18 10:32	04/30/18 19:55	7440-42-8	
Calcium	229	mg/L	0.20	0.054	1	04/27/18 10:32	04/30/18 19:55	7440-70-2	M1
Lithium	12.3	ug/L	10.0	4.6	1	04/27/18 10:32	04/30/18 19:55	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.026	ug/L	1.0	0.026	1	04/26/18 17:10	05/01/18 23:20	7440-36-0	
Arsenic	0.29J	ug/L	1.0	0.052	1	04/26/18 17:10	05/01/18 23:20	7440-38-2	
Barium	123	ug/L	1.0	0.095	1	04/26/18 17:10	05/01/18 23:20	7440-39-3	
Beryllium	<0.012	ug/L	0.50	0.012	1	04/26/18 17:10	05/09/18 15:50	7440-41-7	
Cadmium	<0.018	ug/L	0.50	0.018	1	04/26/18 17:10	05/01/18 23:20	7440-43-9	
Chromium	0.17J	ug/L	1.0	0.054	1	04/26/18 17:10	05/09/18 14:08	7440-47-3	
Cobalt	0.18J	ug/L	1.0	0.014	1	04/26/18 17:10	05/01/18 23:20	7440-48-4	
Lead	0.043J	ug/L	1.0	0.033	1	04/26/18 17:10	05/01/18 23:20	7439-92-1	B
Molybdenum	0.60J	ug/L	1.0	0.058	1	04/26/18 17:10	05/09/18 14:08	7439-98-7	
Selenium	<0.086	ug/L	1.0	0.086	1	04/26/18 17:10	05/01/18 23:20	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/26/18 17:10	05/01/18 23:20	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/25/18 16:05	04/26/18 11:22	7439-97-6	
9040 pH									
Analytical Method: EPA 9040									
pH	7.1	Std. Units	0.10	0.10	1		05/01/18 17:01		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	153	mg/L	20.0	9.2	20		04/28/18 12:51	16887-00-6	
Fluoride	0.10J	mg/L	0.20	0.063	1		04/28/18 12:21	16984-48-8	
Sulfate	305	mg/L	20.0	4.7	20		04/28/18 12:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Sample: MW-309 **Lab ID: 60268626009** Collected: 04/16/18 19:55 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	CLIENT				1		04/16/18 19:55		
Field pH	7.52	Std. Units	0.10	0.050	1		04/16/18 19:55		
Field Temperature	11.2	deg C	0.50	0.25	1		04/16/18 19:55		
Field Specific Conductance	1445	umhos/cm	1.0	1.0	1		04/16/18 19:55		
Field Oxidation Potential	-58.5	mV			1		04/16/18 19:55		
Oxygen, Dissolved	0.37	mg/L			1		04/16/18 19:55	7782-44-7	
Turbidity	36.7	NTU	1.0	1.0	1		04/16/18 19:55		
Groundwater Elevation	647.65	feet			1		04/16/18 19:55		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1340	ug/L	100	12.5	1	04/26/18 17:10	04/30/18 19:23	7440-42-8	
Calcium	150	mg/L	0.20	0.054	1	04/26/18 17:10	04/30/18 19:23	7440-70-2	M1
Lithium	8.0J	ug/L	10.0	4.6	1	04/26/18 17:10	04/30/18 19:23	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	0.079J	ug/L	1.0	0.026	1	04/26/18 17:10	05/01/18 23:32	7440-36-0	
Arsenic	0.62J	ug/L	1.0	0.052	1	04/26/18 17:10	05/01/18 23:32	7440-38-2	
Barium	53.7	ug/L	1.0	0.095	1	04/26/18 17:10	05/01/18 23:32	7440-39-3	
Beryllium	0.056J	ug/L	0.50	0.012	1	04/26/18 17:10	05/09/18 15:58	7440-41-7	
Cadmium	0.052J	ug/L	0.50	0.018	1	04/26/18 17:10	05/01/18 23:32	7440-43-9	B
Chromium	2.7	ug/L	1.0	0.054	1	04/26/18 17:10	05/09/18 14:19	7440-47-3	
Cobalt	2.4	ug/L	1.0	0.014	1	04/26/18 17:10	05/01/18 23:32	7440-48-4	
Lead	0.95J	ug/L	1.0	0.033	1	04/26/18 17:10	05/01/18 23:32	7439-92-1	
Molybdenum	0.29J	ug/L	1.0	0.058	1	04/26/18 17:10	05/09/18 14:19	7439-98-7	
Selenium	<0.086	ug/L	1.0	0.086	1	04/26/18 17:10	05/01/18 23:32	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/26/18 17:10	05/01/18 23:32	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/25/18 16:05	04/26/18 11:25	7439-97-6	
9040 pH									
Analytical Method: EPA 9040									
pH	7.3	Std. Units	0.10	0.10	1		05/01/18 17:02		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	78.9	mg/L	20.0	9.2	20		04/28/18 13:36	16887-00-6	
Fluoride	0.094J	mg/L	0.20	0.063	1		04/28/18 13:21	16984-48-8	
Sulfate	373	mg/L	50.0	11.8	50		04/30/18 02:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Sample: MW-301 Lab ID: **60268626001** Collected: 04/18/18 10:15 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	CLIENT				1		04/18/18 10:15		
Field pH	6.41	Std. Units	0.10	0.050	1		04/18/18 10:15		
Field Temperature	7.2	deg C	0.50	0.25	1		04/18/18 10:15		
Field Specific Conductance	770	umhos/cm	1.0	1.0	1		04/18/18 10:15		
Field Oxidation Potential	105.5	mV			1		04/18/18 10:15		
Oxygen, Dissolved	6.52	mg/L			1		04/18/18 10:15	7782-44-7	
Turbidity	0.66	NTU	1.0	1.0	1		04/18/18 10:15		
Groundwater Elevation	681.53	feet			1		04/18/18 10:15		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	480	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:45	7440-42-8	
Calcium	63.0	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:45	7440-70-2	
Lithium	19.1	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:45	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.026	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:07	7440-36-0	
Arsenic	0.074J	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:07	7440-38-2	
Barium	31.6	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:07	7440-39-3	
Beryllium	<0.012	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 12:53	7440-41-7	
Cadmium	0.023J	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:07	7440-43-9	
Chromium	<0.054	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:07	7440-47-3	
Cobalt	0.46J	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:07	7440-48-4	
Lead	0.041J	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:07	7439-92-1	
Molybdenum	0.67J	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 12:53	7439-98-7	B
Selenium	4.3	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:07	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:07	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:48	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	514	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH									
Analytical Method: EPA 9040									
pH	6.6	Std. Units	0.10	0.10	1		04/24/18 14:37		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	63.4	mg/L	5.0	2.3	5		04/25/18 23:53	16887-00-6	
Fluoride	0.22	mg/L	0.20	0.063	1		04/26/18 00:07	16984-48-8	
Sulfate	186	mg/L	20.0	4.7	20		04/26/18 20:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523027	Analysis Method: EPA 7470
QC Batch Method: EPA 7470	Analysis Description: 7470 Mercury
Associated Lab Samples: 60268626001	

METHOD BLANK: 2141129 Matrix: Water
Associated Lab Samples: 60268626001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/25/18 12:34	

LABORATORY CONTROL SAMPLE: 2141130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.5	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141131 2141132

Parameter	Units	60268637001		2141131		2141132		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	0.31	5	5	5	4.5	4.6	84	86	75-125	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523205 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60268626007, 60268626008, 60268626009

METHOD BLANK: 2141826 Matrix: Water
 Associated Lab Samples: 60268626007, 60268626008, 60268626009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/26/18 11:09	

LABORATORY CONTROL SAMPLE: 2141827

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.5	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141828 2141829

Parameter	Units	60268626007		2141828		2141829		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Mercury	ug/L	<0.090	5	5	5	4.2	4.1	83	82	75-125	1	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523243 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60268626001, 60268626007

METHOD BLANK: 2141937 Matrix: Water

Associated Lab Samples: 60268626001, 60268626007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	04/26/18 20:06	
Calcium	mg/L	<0.054	0.20	0.054	04/26/18 20:06	
Lithium	ug/L	<4.6	10.0	4.6	04/26/18 20:06	

LABORATORY CONTROL SAMPLE: 2141938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	948	95	80-120	
Calcium	mg/L	10	9.7	97	80-120	
Lithium	ug/L	1000	1060	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141939 2141940

Parameter	Units	60268544002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Boron	ug/L	236	1000	1000	1140	1170	91	93	75-125	2	20				
Calcium	mg/L	170	10	10	176	178	64	80	75-125	1	20	M1			
Lithium	ug/L	<4.6	1000	1000	1070	1080	107	108	75-125	1	20				

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2
Pace Project No.: 60274197

QC Batch: 523410 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60268626009

METHOD BLANK: 2142788 Matrix: Water
Associated Lab Samples: 60268626009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	04/30/18 19:16	
Calcium	mg/L	<0.054	0.20	0.054	04/30/18 19:16	
Lithium	ug/L	<4.6	10.0	4.6	04/30/18 19:16	

LABORATORY CONTROL SAMPLE: 2142789

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	982	98	80-120	
Calcium	mg/L	10	10.4	104	80-120	
Lithium	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142790 2142791

Parameter	Units	60268626009		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Boron	ug/L	1340	1000	1000	2380	2340	104	100	75-125	2	20		
Calcium	mg/L	150	10	10	170	168	204	176	75-125	2	20	M1	
Lithium	ug/L	8.0J	1000	1000	1050	1040	104	103	75-125	1	20		

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523468 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60268626008

METHOD BLANK: 2143139 Matrix: Water
 Associated Lab Samples: 60268626008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	04/30/18 19:52	
Calcium	mg/L	<0.054	0.20	0.054	04/30/18 19:52	
Lithium	ug/L	<4.6	10.0	4.6	04/30/18 19:52	

LABORATORY CONTROL SAMPLE: 2143140

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	950	95	80-120	
Calcium	mg/L	10	9.8	98	80-120	
Lithium	ug/L	1000	954	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2143141 2143142

Parameter	Units	60268626008		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Boron	ug/L	210	1000	1000	1200	1190	99	98	75-125	1	20		
Calcium	mg/L	229	10	10	233	228	32	-16	75-125	2	20	M1	
Lithium	ug/L	12.3	1000	1000	1030	1010	101	100	75-125	1	20		

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523241 Analysis Method: EPA 6020
 QC Batch Method: EPA 3010 Analysis Description: 6020 MET
 Associated Lab Samples: 60268626001, 60268626007

METHOD BLANK: 2141931 Matrix: Water

Associated Lab Samples: 60268626001, 60268626007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	05/01/18 20:50	
Arsenic	ug/L	<0.052	1.0	0.052	05/01/18 20:50	
Barium	ug/L	<0.095	1.0	0.095	05/01/18 20:50	
Beryllium	ug/L	<0.012	0.50	0.012	05/09/18 12:23	
Cadmium	ug/L	<0.018	0.50	0.018	05/01/18 20:50	
Chromium	ug/L	<0.054	1.0	0.054	05/01/18 20:50	
Cobalt	ug/L	<0.014	1.0	0.014	05/01/18 20:50	
Lead	ug/L	<0.033	1.0	0.033	05/01/18 20:50	
Molybdenum	ug/L	0.085J	1.0	0.058	05/09/18 12:23	
Selenium	ug/L	<0.086	1.0	0.086	05/01/18 20:50	
Thallium	ug/L	<0.036	1.0	0.036	05/01/18 20:50	

LABORATORY CONTROL SAMPLE: 2141932

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.8	94	80-120	
Arsenic	ug/L	40	37.4	93	80-120	
Barium	ug/L	40	38.8	97	80-120	
Beryllium	ug/L	40	41.9	105	80-120	
Cadmium	ug/L	40	39.8	100	80-120	
Chromium	ug/L	40	37.8	95	80-120	
Cobalt	ug/L	40	37.5	94	80-120	
Lead	ug/L	40	40.6	101	80-120	
Molybdenum	ug/L	40	43.1	108	80-120	
Selenium	ug/L	40	36.6	91	80-120	
Thallium	ug/L	40	39.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141933 2141934

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60268544001 Result	Spike Conc.	Spike Conc.	Result							Result
Antimony	ug/L	<0.026	80	80	74.4	73.5	93	92	75-125	1	20	
Arsenic	ug/L	0.19J	80	80	74.6	73.1	93	91	75-125	2	20	
Barium	ug/L	44.9	80	80	117	117	90	91	75-125	0	20	
Beryllium	ug/L	<0.012	80	80	80.4	79.2	100	99	75-125	1	20	
Cadmium	ug/L	<0.018	80	80	76.2	75.5	95	94	75-125	1	20	
Chromium	ug/L	0.76J	80	80	76.2	74.2	94	92	75-125	3	20	
Cobalt	ug/L	<0.014	80	80	72.6	70.9	91	89	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Parameter	Units	60268544001		2141933		2141934		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result								
Lead	ug/L	<0.033	80	80	83.0	77.0	104	96	75-125	7	20				
Molybdenum	ug/L	0.35J	80	80	87.2	85.8	109	107	75-125	2	20				
Selenium	ug/L	0.24J	80	80	70.0	70.6	87	88	75-125	1	20				
Thallium	ug/L	<0.036	80	80	77.0	76.2	96	95	75-125	1	20				

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2
Pace Project No.: 60274197

QC Batch: 523411 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60268626008, 60268626009

METHOD BLANK: 2142792 Matrix: Water
Associated Lab Samples: 60268626008, 60268626009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	05/01/18 23:11	
Arsenic	ug/L	<0.052	1.0	0.052	05/01/18 23:11	
Barium	ug/L	2.4	1.0	0.095	05/01/18 23:11	
Beryllium	ug/L	<0.012	0.50	0.012	05/09/18 14:01	
Cadmium	ug/L	0.035J	0.50	0.018	05/01/18 23:11	
Chromium	ug/L	<0.054	1.0	0.054	05/09/18 14:01	
Cobalt	ug/L	<0.014	1.0	0.014	05/01/18 23:11	
Lead	ug/L	0.070J	1.0	0.033	05/01/18 23:11	
Molybdenum	ug/L	<0.058	1.0	0.058	05/09/18 14:01	
Selenium	ug/L	<0.086	1.0	0.086	05/01/18 23:11	
Thallium	ug/L	<0.036	1.0	0.036	05/01/18 23:11	

LABORATORY CONTROL SAMPLE: 2142793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.8	95	80-120	
Arsenic	ug/L	40	36.9	92	80-120	
Barium	ug/L	40	38.5	96	80-120	
Beryllium	ug/L	40	42.4	106	80-120	
Cadmium	ug/L	40	39.1	98	80-120	
Chromium	ug/L	40	42.4	106	80-120	
Cobalt	ug/L	40	36.7	92	80-120	
Lead	ug/L	40	37.4	94	80-120	
Molybdenum	ug/L	40	42.5	106	80-120	
Selenium	ug/L	40	36.6	92	80-120	
Thallium	ug/L	40	36.1	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142794 2142795

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60268626008 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Antimony	ug/L	<0.026	40	40	35.7	35.4	89	88	75-125	1	20	
Arsenic	ug/L	0.29J	40	40	36.1	35.6	90	88	75-125	2	20	
Barium	ug/L	123	40	40	164	161	103	95	75-125	2	20	
Beryllium	ug/L	<0.012	40	40	38.7	38.7	97	97	75-125	0	20	
Cadmium	ug/L	<0.018	40	40	36.0	35.7	90	89	75-125	1	20	
Chromium	ug/L	0.17J	40	40	40.1	40.3	100	100	75-125	1	20	
Cobalt	ug/L	0.18J	40	40	33.6	32.4	83	81	75-125	3	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Parameter	Units	60268626008		2142794		2142795		% Rec	% Rec	% Rec	% Rec	Limits	RPD	RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result								
Lead	ug/L	0.043J	40	40	37.2	33.9	93	85	75-125	9	20				
Molybdenum	ug/L	0.60J	40	40	44.3	43.3	109	107	75-125	2	20				
Selenium	ug/L	<0.086	40	40	34.1	33.6	85	84	75-125	1	20				
Thallium	ug/L	<0.036	40	40	36.7	33.4	92	83	75-125	9	20				

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch:	523085	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60268626001		

METHOD BLANK: 2141358 Matrix: Water
Associated Lab Samples: 60268626001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/25/18 12:50	

LABORATORY CONTROL SAMPLE: 2141359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 2141360

Parameter	Units	60268626001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	514	509	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 522990 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60268626001

SAMPLE DUPLICATE: 2140945

Parameter	Units	60268289002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	13.4	13.4	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 524035 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60268626007, 60268626008, 60268626009

SAMPLE DUPLICATE: 2145257

Parameter	Units	60268626005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.3	7.4	1	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523195 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60268626001

METHOD BLANK: 2141792 Matrix: Water

Associated Lab Samples: 60268626001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	04/25/18 15:00	
Fluoride	mg/L	<0.19	0.20	0.19	04/25/18 15:00	

LABORATORY CONTROL SAMPLE: 2141793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141795 2141796

Parameter	Units	60268626006		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	54.4	25	25	82.8	82.7	114	113	80-120	0	15		
Fluoride	mg/L	0.11J	2.5	2.5	2.7	2.7	102	104	80-120	1	15		

SAMPLE DUPLICATE: 2141794

Parameter	Units	60268544001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6.7	6.7	0	15	
Fluoride	mg/L	0.11J	<0.19		15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch:	523380	Analysis Method:	EPA 9056
QC Batch Method:	EPA 9056	Analysis Description:	9056 IC Anions
Associated Lab Samples:	60268626001		

METHOD BLANK: 2142687 Matrix: Water
Associated Lab Samples: 60268626001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	04/26/18 17:00	

LABORATORY CONTROL SAMPLE: 2142688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.3	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142690 2142691

Parameter	Units	60268626001		2142690		2142691		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Sulfate	mg/L	186	100	100	284	286	98	100	80-120	1	15

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2
Pace Project No.: 60274197

QC Batch: 523619 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60268626007, 60268626008, 60268626009

METHOD BLANK: 2143926 Matrix: Water
Associated Lab Samples: 60268626007, 60268626008, 60268626009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	04/28/18 09:52	
Fluoride	mg/L	<0.19	0.20	0.19	04/28/18 09:52	
Sulfate	mg/L	<0.24	1.0	0.24	04/28/18 09:52	

LABORATORY CONTROL SAMPLE: 2143927

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.4	98	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2143928 2143929

Parameter	Units	60268626007 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Fluoride	mg/L	0.11J	2.5	2.5	2.8	2.9	106	110	80-120	3	15	
Sulfate	mg/L	103	50	50	155	154	102	101	80-120	1	15	

SAMPLE DUPLICATE: 2143930

Parameter	Units	60268626008 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	153	149	3	15	
Fluoride	mg/L	0.10J	<0.19		15	
Sulfate	mg/L	305	296	3	15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

QC Batch: 523648 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60268626007, 60268626009

METHOD BLANK: 2144152 Matrix: Water

Associated Lab Samples: 60268626007, 60268626009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	04/30/18 00:58	
Sulfate	mg/L	<0.24	1.0	0.24	04/30/18 00:58	

LABORATORY CONTROL SAMPLE: 2144153

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2144154 2144155

Parameter	Units	60268626007		2144155		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	224	100	100	328	327	105	103	80-120	0	15

SAMPLE DUPLICATE: 2144156

Parameter	Units	60268626009 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	373	352	6	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

WORKORDER QUALIFIERS

WO: 60274197

[1] Rev. 1 7/6/2018

[2] Samples MW-302, MW-303, MW 304, MW-305, MW-306 have been omitted at the request of the client.

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.18 2

Pace Project No.: 60274197

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60268626001	MW-301		524165		
60268626007	MW-307		524165		
60268626008	MW-308		524165		
60268626009	MW-309		524165		
60268626001	MW-301	EPA 3010	523243	EPA 6010	523279
60268626007	MW-307	EPA 3010	523243	EPA 6010	523279
60268626008	MW-308	EPA 3010	523468	EPA 6010	523539
60268626009	MW-309	EPA 3010	523410	EPA 6010	523461
60268626001	MW-301	EPA 3010	523241	EPA 6020	523278
60268626007	MW-307	EPA 3010	523241	EPA 6020	523278
60268626008	MW-308	EPA 3010	523411	EPA 6020	523463
60268626009	MW-309	EPA 3010	523411	EPA 6020	523463
60268626001	MW-301	EPA 7470	523027	EPA 7470	523058
60268626007	MW-307	EPA 7470	523205	EPA 7470	523239
60268626008	MW-308	EPA 7470	523205	EPA 7470	523239
60268626009	MW-309	EPA 7470	523205	EPA 7470	523239
60268626001	MW-301	SM 2540C	523085		
60268626001	MW-301	EPA 9040	522990		
60268626007	MW-307	EPA 9040	524035		
60268626008	MW-308	EPA 9040	524035		
60268626009	MW-309	EPA 9040	524035		
60268626001	MW-301	EPA 9056	523195		
60268626001	MW-301	EPA 9056	523380		
60268626007	MW-307	EPA 9056	523619		
60268626007	MW-307	EPA 9056	523648		
60268626008	MW-308	EPA 9056	523619		
60268626009	MW-309	EPA 9056	523619		
60268626009	MW-309	EPA 9056	523648		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60268626

60268626

Client Name: SXS ENGINEERS
 Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other
 Tracking #: 4122 4945 7067 Pace Shipping Label Used? Yes No
 Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No
 Packing Material: Bubble Wrap Bubble Bags Foam None Other EPIC
 Thermometer Used: T298 Type of Ice: Wei Blue None
 Cooler Temperature (°C): As-read 2.9 Corr. Factor +1.1 Corrected 4.0

Date and initials of person examining contents: SPK 4-20-18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>RECEIVED 2 BPSN CO SAMPLES FOR MW30</u>
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>MW306, COC SHOWS ONLY 1</u>
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

Project Manager Review: SPK Date: 4-23-18



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A		Section B		Section C	
Required Client Information:		Required Project Information:		Invoice Information:	
Company: SCS Engineers	Report To: Meghan Blodgett	Company Name: SCS Engineers	Attention: Meghan Blodgett/Jess Valcheff	Page: _____	of _____
Address: 2830 Dairy Drive	Copy To: Tom Karwaski	Address: _____	Company Name: SCS Engineers		
Madison WI 53718	Purchase Order No.: _____	Address: _____	Address: _____		
Email To: mblodgett@scsengineers.com	Project Name: Ootumwa Generating Station	Project Name: Trudy Gipson 913-563-1405	Site Location: _____		
Phone: 608-216-7362	Project Number: 25216072.18	Project Number: 6696 Line 2	STATE: IA		
Requested Due Date/TAT: _____					

ITEM #	Valid Matrix Codes	Section D Required Client Information	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Unpreserved	Preservatives	Requested Analysis Filtered (Y/N)	Pace Project No. / Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB							
1	MW-301	MATRIX DRINKING WATER DW	4-18-18	10:15	G	WT	2	1		N	6010 Total Metals: B-Ca
2	MW-302	MATRIX WASTE WATER WW	11-18	10:15	G	WT	2	1		N	6010 Total Metals: B-Ca
3	MW-303	MATRIX WASTE WATER WW	12-20	8:30	G	WT	2	1		N	6010 Total Metals: B-Ca
4	MW-304	MATRIX WASTE WATER WW	13-18	13:40	G	WT	2	1		N	6010 Total Metals: B-Ca
5	MW-305	MATRIX WASTE WATER WW	14-50	14:00	G	WT	2	1		N	6010 Total Metals: B-Ca
6	MW-306	MATRIX WASTE WATER WW	16-18	13:10	G	WT	2	1		N	6010 Total Metals: B-Ca
7	MW-307	MATRIX WASTE WATER WW	4-16-18	20:55	G	WT	3	1		N	6010 Total Metals: B-Ca
8	MW-308	MATRIX WASTE WATER WW	4-16-18	17:40	G	WT	3	1		N	6010 Total Metals: B-Ca
9	MW-309	MATRIX WASTE WATER WW	4-16-18	19:55	G	WT	3	1		N	6010 Total Metals: B-Ca
10	FIELD BLANK	MATRIX FIELD BLANK	4-18-18	16:30	G	WT	3	1		N	6010 Total Metals: B-Ca
11											
12											

Ship To: 9608 Loriet Boulevard, Lenexa, KS 66219	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS								
Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mn-Se-Tl	4-19-18	9:00	Paul A. Jordan	4-20-18	08:45	Y Y Y								
<table border="1"> <tr> <td>Temp in °C</td> <td>Received on Ice (Y/N)</td> <td>Custody Sealed (Y/N)</td> <td>Samples Intact (Y/N)</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>							Temp in °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)				
Temp in °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)											
<table border="1"> <tr> <td>SAMPLER NAME AND SIGNATURE</td> <td>DATE Signed (MM/DD/YY)</td> </tr> <tr> <td>PRINT Name of SAMPLER:</td> <td></td> </tr> <tr> <td>SIGNATURE of SAMPLER:</td> <td></td> </tr> </table>							SAMPLER NAME AND SIGNATURE	DATE Signed (MM/DD/YY)	PRINT Name of SAMPLER:		SIGNATURE of SAMPLER:			
SAMPLER NAME AND SIGNATURE	DATE Signed (MM/DD/YY)													
PRINT Name of SAMPLER:														
SIGNATURE of SAMPLER:														

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days. F-ALL-Q-020rev.07, 15-Feb-2007

January 22, 2019

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.18 2.
Pace Project No.: 60274200

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory between April 20, 2018 and July 06, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274200001	No Sample	Water	07/06/18 08:00	07/06/18 09:22
60268653007	MW-307	Water	04/16/18 20:55	04/20/18 08:45
60268653008	MW-308	Water	04/16/18 17:40	04/20/18 08:45
60268653009	MW-309	Water	04/16/18 19:55	04/20/18 08:45
60268653001	MW-301	Water	04/18/18 10:15	04/20/18 08:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60268653007	MW-307	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653008	MW-308	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653009	MW-309	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653001	MW-301	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Sample: MW-307 **Lab ID: 60268653007** Collected: 04/16/18 20:55 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.31 ± 0.657 (0.537) C:NA T:84%	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	1.65 ± 0.521 (0.698) C:81% T:96%	pCi/L	05/14/18 16:29	15262-20-1	
Total Radium	Total Radium Calculation	2.96 ± 1.18 (1.24)	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Sample: MW-308 **Lab ID: 60268653008** Collected: 04/16/18 17:40 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.532 ± 0.541 (0.818) C:NA T:84%	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	1.10 ± 0.429 (0.664) C:80% T:94%	pCi/L	05/14/18 16:29	15262-20-1	
Total Radium	Total Radium Calculation	1.63 ± 0.970 (1.48)	pCi/L	05/15/18 11:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Sample: MW-309 **Lab ID: 60268653009** Collected: 04/16/18 19:55 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.974 ± 0.589 (0.646) C:NA T:86%	pCi/L	05/09/18 21:16	13982-63-3	
Radium-228	EPA 904.0	0.614 ± 0.404 (0.772) C:80% T:83%	pCi/L	05/14/18 16:29	15262-20-1	
Total Radium	Total Radium Calculation	1.59 ± 0.993 (1.42)	pCi/L	05/15/18 11:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Sample: MW-301 **Lab ID: 60268653001** Collected: 04/18/18 10:15 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.145 ± 0.348 (0.672) C:NA T:90%	pCi/L	05/09/18 20:47	13982-63-3	
Radium-228	EPA 904.0	0.368 ± 0.464 (0.989) C:80% T:83%	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	0.513 ± 0.812 (1.66)	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

QC Batch:	296662	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60268653001, 60268653007, 60268653008, 60268653009		

METHOD BLANK:	1452104	Matrix:	Water
Associated Lab Samples:	60268653001, 60268653007, 60268653008, 60268653009		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.550 ± 0.326 (0.592) C:82% T:89%	pCi/L	05/14/18 16:30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

QC Batch:	296635	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60268653001, 60268653007, 60268653008, 60268653009		

METHOD BLANK:	1452068	Matrix:	Water
Associated Lab Samples:	60268653001, 60268653007, 60268653008, 60268653009		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0634 ± 0.289 (0.172) C:NA T:93%	pCi/L	05/09/18 20:47	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

WORKORDER QUALIFIERS

WO: 60274200

[1] Rev. 1 7/6/2018

[2] Revised report omitting samples MW-302, MW-303, MW-304, MW-305, MW-306 at the request of the client.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.18 2.

Pace Project No.: 60274200

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60268653001	MW-301	EPA 903.1	296635		
60268653007	MW-307	EPA 903.1	296635		
60268653008	MW-308	EPA 903.1	296635		
60268653009	MW-309	EPA 903.1	296635		
60268653001	MW-301	EPA 904.0	296662		
60268653007	MW-307	EPA 904.0	296662		
60268653008	MW-308	EPA 904.0	296662		
60268653009	MW-309	EPA 904.0	296662		
60268653001	MW-301	Total Radium Calculation	298436		
60268653007	MW-307	Total Radium Calculation	298436		
60268653008	MW-308	Total Radium Calculation	298443		
60268653009	MW-309	Total Radium Calculation	298443		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60268653

 60268653

Client Name: SCS ENGINEERS

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 4122 4945 7160 / 4122 4925 7056 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-300 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 2.0 Corr. Factor +1.2 Corrected 3.2

Date and initials of person examining contents: BPM 4-20-18

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>NT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature]

Date: 4-24-18



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: SCS Engineers	Report To: Meghan Blodgett	Company Name: SCS Engineers	Attention: Meghan Blodgett/Jess Valcheff	Company Name: SCS Engineers	Regulatory Agency:
Address: 2830 Dairy Drive	Copy To: Tom Karwaski	Address:		NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/>	UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>
Email To: mblodgett@scsengineers.com	Purchase Order No.:	Pace Quote Reference:		Site Location	STATE: IA
Phone: 608-216-7362	Project Name: Oltumwa Generating Station	Pace Project Manager:	Trudy Gipson 913-563-1405		
Requested Due Date/TAT:	Project Number: 25216072.18	Pace Profile #:	6696 Line 2		

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑	Y/N ↑	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				DATE	TIME								
1	MW-301	WT G	xxx	4-18-18	10:15	72	2	H ₂ SO ₄	X	X	X	604.0 Radium-226	604-2-28F 2-6PIN 601
2	MW-302	WT G	xxx	11:10	10:15	72	2	HNO ₃	X	X	X	603.1 Radium-226	604-2-28F 2-6PIN 601
3	MW-303	WT G	xxx	12:30	8:30	72	2	HCl	X	X	X		604-2-28F 2-6PIN 601
4	MW-304	WT G	xxx	13:40	12:30	72	2	NaOH	X	X	X		604-2-28F 2-6PIN 601
5	MW-305	WT G	xxx	14:50	12:30	72	2	Na ₂ S ₂ O ₃	X	X	X		604-2-28F 2-6PIN 601
6	MW-306	WT G	xxx	16:10	12:30	72	2	Methanol	X	X	X		604-2-28F 2-6PIN 601
7	MW-307	WT G	xxx	4-16-18	20:55	11.6	2	Other	X	X	X		604-2-28F 2-6PIN 601
8	MW-308	WT G	xxx	17:40	11:5	72	2		X	X	X		604-2-28F 2-6PIN 601
9	MW-309	WT G	xxx	19:55	11:2	72	2		X	X	X		604-2-28F 2-6PIN 601
10	FIELD BLANK	WT G	xxx	4-18-18	16:30	-	2		X	X	X		604-2-28F 2-6PIN 601

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Ship To: 9608 Lorett Boulevard, Lenexa, KS 66219				<i>[Signature]</i>	4-20-18	0845	Temp in °C: 3.2 Received on: Y Cooler (Y/N): Y Custody Sealed: Y Samples Intact: Y

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Chain of Custody

Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: IA



Workorder: 60268653 Workorder Name: Ottumwa Gen Sta/25216072.18

Owner Received Date: 4/20/2018 Results Requested By: 5/15/2018

Report To		Subcontract To		Requested Analysis				
Trudy Gipson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1405		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600		903.1 Radium-226 904.0 Radium-228 & Total Radium				
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	LAB USE ONLY	
1	MW-301	PS	4/18/2018 10:15	60268653001	Water	2	001	
2	MW-302	PS	4/18/2018 11:10	60268653002	Water	2	002	
3	MW-303	PS	4/18/2018 12:20	60268653003	Water	2	003	
4	MW-304	PS	4/18/2018 13:40	60268653004	Water	2	004	
5	MW-305	PS	4/18/2018 14:50	60268653005	Water	2	005	
6	MW-306	PS	4/18/2018 16:10	60268653006	Water	2	006	
7	MW-307	PS	4/16/2018 20:55	60268653007	Water	2	007	
8	MW-308	PS	4/16/2018 17:40	60268653008	Water	2	008	
9	MW-309	PS	4/16/2018 19:55	60268653009	Water	2	009	
10	FIELD BLANK	PS	4/18/2018 16:30	60268653010	Water	2	010	
Transfers	Released By	Date/Time	Received By	Date/Time	Comments			
1	E Beckwith (Pesi)	4/25/18 16:25	Subcontracting	4-26-18	0935			
2								
3								
Cooler Temperature on Receipt		—°C	Custody Seal	Y or <input checked="" type="radio"/> N	Received on Ice	Y or <input checked="" type="radio"/> N	Samples Intact	<input checked="" type="radio"/> Y or <input type="radio"/> N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pittsburgh Lab Sample Condition Upon Receipt

30250798

Pace Analytical

Client Name: Pace Texas

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 4368 7273 9837

Label	<u>DS</u>
LIMS Login	<u>DS</u>

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

pH paper Lot#	<u>1203671</u>
Date and Initials of person examining contents:	<u>DS 4-26-18</u>

Comments:	Yes No N/A			1203671	Date and Initials of person examining contents: DS 4-26-18
	Yes	No	N/A		
Chain of Custody Present:	/			1.	
Chain of Custody Filled Out:	/			2.	
Chain of Custody Relinquished:	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC:	/			5.	
-Includes date/time/ID Matrix: <u>WT</u>					
Samples Arrived within Hold Time:	/			6.	
Short Hold Time Analysis (<72hr remaining):	/			7.	
Rush Turn Around Time Requested:	/			8.	
Sufficient Volume:	/			9.	
Correct Containers Used:	/			10.	
-Pace Containers Used:	/				
Containers Intact:	/			11.	
Orthophosphate field filtered			/	12.	
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.	
Organic Samples checked for dechlorination:			/	14.	
Filtered volume received for Dissolved tests			/	15.	
All containers have been checked for preservation.	/			16.	
All containers needing preservation are found to be in compliance with EPA recommendation.	/				<u>phex</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics					Initial when completed: <u>DS</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	17.	
Trip Blank Present:			/	18.	
Trip Blank Custody Seals Present			/		
Rad Aqueous Samples Screened > 0.5 mrem/hr	/				Initial when completed: <u>DS</u> Date: <u>4-26-18</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

June 25, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OTTUMWA GENERATING STATION
Pace Project No.: 60271552

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on May 31, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60271552001	MW-307	Water	05/30/18 09:15	05/31/18 09:05
60271552002	MW-308	Water	05/30/18 10:20	05/31/18 09:05
60271552003	MW-309	Water	05/30/18 11:10	05/31/18 09:05
60271552004	FIELD BLANK	Water	05/30/18 09:10	05/31/18 09:05

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60271552001	MW-307	SM 2540C	JDA	1	PASI-K
60271552002	MW-308	SM 2540C	JDA	1	PASI-K
60271552003	MW-309	SM 2540C	JDA	1	PASI-K
60271552004	FIELD BLANK	SM 2540C	JDA	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Sample: MW-307 **Lab ID: 60271552001** Collected: 05/30/18 09:15 Received: 05/31/18 09:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	CLIENT				1		05/30/18 09:15		
Field pH	6.44	Std. Units	0.10	0.050	1		05/30/18 09:15		
Field Temperature	12.7	deg C	0.50	0.25	1		05/30/18 09:15		
Field Specific Conductance	1710	umhos/cm	1.0	1.0	1		05/30/18 09:15		
Field Oxidation Potential	-45.8	mV			1		05/30/18 09:15		
Oxygen, Dissolved	.18	mg/L			1		05/30/18 09:15	7782-44-7	
Turbidity	18.58	NTU	1.0	1.0	1		05/30/18 09:15		
Groundwater Elevation	652.45	feet			1		05/30/18 09:15		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1100	mg/L	5.0	5.0	1		06/04/18 13:13		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Sample: MW-308 **Lab ID: 60271552002** Collected: 05/30/18 10:20 Received: 05/31/18 09:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	CLIENT				1		05/30/18 10:20		
Field pH	6.61	Std. Units	0.10	0.050	1		05/30/18 10:20		
Field Temperature	12.1	deg C	0.50	0.25	1		05/30/18 10:20		
Field Specific Conductance	1611	umhos/cm	1.0	1.0	1		05/30/18 10:20		
Field Oxidation Potential	-48.2	mV			1		05/30/18 10:20		
Oxygen, Dissolved	.14	mg/L			1		05/30/18 10:20	7782-44-7	
Turbidity	3.34	NTU	1.0	1.0	1		05/30/18 10:20		
Groundwater Elevation	651.05	feet			1		05/30/18 10:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1090	mg/L	5.0	5.0	1		06/04/18 13:13		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Sample: MW-309 **Lab ID: 60271552003** Collected: 05/30/18 11:10 Received: 05/31/18 09:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	CLIENT				1		05/30/18 11:10		
Field pH	6.92	Std. Units	0.10	0.050	1		05/30/18 11:10		
Field Temperature	12.4	deg C	0.50	0.25	1		05/30/18 11:10		
Field Specific Conductance	1484	umhos/cm	1.0	1.0	1		05/30/18 11:10		
Field Oxidation Potential	-38	mV			1		05/30/18 11:10		
Oxygen, Dissolved	.12	mg/L			1		05/30/18 11:10	7782-44-7	
Turbidity	40.55	NTU	1.0	1.0	1		05/30/18 11:10		
Groundwater Elevation	650.98	feet			1		05/30/18 11:10		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1050	mg/L	5.0	5.0	1		06/04/18 13:13		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Sample: FIELD BLANK **Lab ID: 60271552004** Collected: 05/30/18 09:10 Received: 05/31/18 09:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		06/04/18 13:13		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

QC Batch: 528494

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60271552001, 60271552002, 60271552003, 60271552004

METHOD BLANK: 2165079

Matrix: Water

Associated Lab Samples: 60271552001, 60271552002, 60271552003, 60271552004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/04/18 13:13	

LABORATORY CONTROL SAMPLE: 2165080

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	991	99	80-120	

SAMPLE DUPLICATE: 2165081

Parameter	Units	60271542001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	408	400	2	10	

SAMPLE DUPLICATE: 2165082

Parameter	Units	60271619002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	130	132	1	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

WORKORDER QUALIFIERS

WO: 60271552

[1] Rev. 1

[2] Report revised to include client sampled pH value for sample MW-309

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60271552

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271552001	MW-307		529084		
60271552002	MW-308		529084		
60271552003	MW-309		529084		
60271552001	MW-307	SM 2540C	528494		
60271552002	MW-308	SM 2540C	528494		
60271552003	MW-309	SM 2540C	528494		
60271552004	FIELD BLANK	SM 2540C	528494		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60271552



60271552

Client Name: SCS Engineers

Courier: FedEx [X] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 436872744387 Pace Shipping Label Used? Yes [] No [X]

Custody Seal on Cooler/Box Present: Yes [X] No [] Seals intact: Yes [X] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [] Other [X] Zpic

Thermometer Used: T300 Type of Ice: Wet [X] Blue [] None []

Cooler Temperature (°C): As-read 1.0 Corr. Factor 41.2 Corrected 2.2

Date and initials of person examining contents: 5/31/18 HK

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., PH, LOT, HK).

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: HWK

Date: 5-31-2018



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: SCS Engineers	Report To: Meghan Blodgett	Attention: Meghan Blodgett/Jess Valcheff
Address: 2830 Dairy Drive Madison WI 53718	Copy To: Tom Karwaski	Company Name: SCS Engineers
Email To: mblodgett@scesengineers.com	Purchase Order No.:	Address:
Phone: 608-216-7362 Fax:	Project Name: Ottumwa Generating Station	Pace Quote Reference:
Requested Due Date/TAT: 8/3/2019	Project Number: 25216072.18	Pace Project Manager:
		Pace Profile #: 6696 Line 2

Page: / of /

REGULATORY AGENCY
<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER
Site Location: IA
STATE: IA

ITEM #	Classification	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WIP AIR AR OTHER OT TISSUE TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	PRESERVATIVES	Analysis Test Y/N	Requested Analysis Filtered (Y/N)	Temp In °C	Received on Cooler (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)	
			COMPOSITE START DATE TIME	COMPOSITE ENDIGRAB DATE TIME											
1	MW-301				G	WT	1	Unpreserved							
2	MW-302				G	WT	1	H ₂ SO ₄							
3	MW-303				G	WT	1	HCl							
4	MW-304				G	WT	1	NaOH							
5	MW-305				G	WT	1	Na ₂ S ₂ O ₃							
6	MW-306				G	WT	1	Methanol							
7	MW-307		5/30/18 9:15		G	WT	1	Other							
8	MW-308		10:20		G	WT	1								
9	MW-309		11:10		G	WT	1								
10	FIELD BLANK		9:10		G	WT	1								
11															
12															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Hoover	5/30/18	13:30	K. Z. Pfeiffer	5/31/18	0905	1.04 Y Y Y
* Sb-As-Ba-Bi-Cd-Cr-Co-Pb-Mo-Se-Tl							

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	DATE Signed (MM/DD/YY):
SIGNATURE of SAMPLER:	

A7 Round 7 Background Sampling, Analytical Laboratory Reports

July 25, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OTTUMWA GENERATING STATION
Pace Project No.: 60273934

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on July 02, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60273934001	MW-307	Water	06/28/18 17:40	07/02/18 08:35
60273934002	MW-308	Water	06/28/18 19:00	07/02/18 08:35
60273934003	MW-309	Water	06/28/18 20:00	07/02/18 08:35
60273934004	FIELD BLANK	Water	06/28/18 19:25	07/02/18 08:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60273934001	MW-307	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	LMB	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60273934002	MW-308	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	LMB	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60273934003	MW-309	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	LMB	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60273934004	FIELD BLANK	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	LMB	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-307 **Lab ID: 60273934001** Collected: 06/28/18 17:40 Received: 07/02/18 08:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/28/18 17:40		
Field pH	6.87	Std. Units	0.10	0.050	1		06/28/18 17:40		
Field Temperature	13.4	deg C	0.50	0.25	1		06/28/18 17:40		
Field Specific Conductance	1686	umhos/cm	1.0	1.0	1		06/28/18 17:40		
Field Oxidation Potential	-43.4	mV			1		06/28/18 17:40		
Oxygen, Dissolved	0.21	mg/L			1		06/28/18 17:40	7782-44-7	
Turbidity	53.34	NTU	1.0	1.0	1		06/28/18 17:40		
Groundwater Elevation	652.87	feet			1		06/28/18 17:40		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	210	ug/L	100	12.5	1	07/03/18 16:20	07/16/18 20:09	7440-42-8	
Calcium	239	mg/L	0.20	0.054	1	07/03/18 16:20	07/16/18 20:09	7440-70-2	
Lithium	13.2	ug/L	10.0	4.6	1	07/03/18 16:20	07/16/18 20:09	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:41	7440-36-0	
Arsenic	0.86J	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:41	7440-38-2	
Barium	147	ug/L	1.0	0.34	1	07/03/18 10:15	07/13/18 15:41	7440-39-3	
Beryllium	<0.12	ug/L	0.50	0.12	1	07/03/18 10:15	07/13/18 15:41	7440-41-7	
Cadmium	<0.070	ug/L	0.50	0.070	1	07/03/18 10:15	07/13/18 15:41	7440-43-9	
Chromium	1.4	ug/L	1.0	0.19	1	07/03/18 10:15	07/13/18 15:41	7440-47-3	B
Cobalt	2.9	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:41	7440-48-4	
Lead	0.48J	ug/L	1.0	0.12	1	07/03/18 10:15	07/13/18 15:41	7439-92-1	
Molybdenum	0.39J	ug/L	1.0	0.13	1	07/03/18 10:15	07/13/18 15:41	7439-98-7	
Selenium	0.25J	ug/L	1.0	0.16	1	07/03/18 10:15	07/13/18 15:41	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/03/18 10:15	07/13/18 15:41	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.037	ug/L	0.20	0.037	1	07/24/18 12:45	07/24/18 16:36	7439-97-6	

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-308 **Lab ID: 60273934002** Collected: 06/28/18 19:00 Received: 07/02/18 08:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/28/18 19:00		
Field pH	7.08	Std. Units	0.10	0.050	1		06/28/18 19:00		
Field Temperature	13.1	deg C	0.50	0.25	1		06/28/18 19:00		
Field Specific Conductance	1584	umhos/cm	1.0	1.0	1		06/28/18 19:00		
Field Oxidation Potential	-60.3	mV			1		06/28/18 19:00		
Oxygen, Dissolved	0.19	mg/L			1		06/28/18 19:00	7782-44-7	
Turbidity	5.87	NTU	1.0	1.0	1		06/28/18 19:00		
Groundwater Elevation	651.43	feet			1		06/28/18 19:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	153	ug/L	100	12.5	1	07/03/18 16:20	07/16/18 20:11	7440-42-8	
Calcium	215	mg/L	0.20	0.054	1	07/03/18 16:20	07/16/18 20:11	7440-70-2	
Lithium	17.6	ug/L	10.0	4.6	1	07/03/18 16:20	07/16/18 20:11	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:49	7440-36-0	
Arsenic	0.39J	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:49	7440-38-2	
Barium	134	ug/L	1.0	0.34	1	07/03/18 10:15	07/13/18 15:49	7440-39-3	
Beryllium	<0.12	ug/L	0.50	0.12	1	07/03/18 10:15	07/13/18 15:49	7440-41-7	
Cadmium	<0.070	ug/L	0.50	0.070	1	07/03/18 10:15	07/13/18 15:49	7440-43-9	
Chromium	0.42J	ug/L	1.0	0.19	1	07/03/18 10:15	07/13/18 15:49	7440-47-3	B
Cobalt	0.19J	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:49	7440-48-4	
Lead	<0.12	ug/L	1.0	0.12	1	07/03/18 10:15	07/13/18 15:49	7439-92-1	
Molybdenum	0.46J	ug/L	1.0	0.13	1	07/03/18 10:15	07/13/18 15:49	7439-98-7	
Selenium	<0.16	ug/L	1.0	0.16	1	07/03/18 10:15	07/13/18 15:49	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/03/18 10:15	07/13/18 15:49	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.037	ug/L	0.20	0.037	1	07/24/18 12:45	07/24/18 16:34	7439-97-6	

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-309 **Lab ID: 60273934003** Collected: 06/28/18 20:00 Received: 07/02/18 08:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	Client				1		06/28/18 20:00		
Field pH	7.36	Std. Units	0.10	0.050	1		06/28/18 20:00		
Field Temperature	13.8	deg C	0.50	0.25	1		06/28/18 20:00		
Field Specific Conductance	1477	umhos/cm	1.0	1.0	1		06/28/18 20:00		
Field Oxidation Potential	-45.5	mV			1		06/28/18 20:00		
Oxygen, Dissolved	0.17	mg/L			1		06/28/18 20:00	7782-44-7	
Turbidity	241.4	NTU	1.0	1.0	1		06/28/18 20:00		
Groundwater Elevation	651.47	feet			1		06/28/18 20:00		
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	1360	ug/L	100	12.5	1	07/03/18 16:20	07/16/18 20:14	7440-42-8	
Calcium	181	mg/L	0.20	0.054	1	07/03/18 16:20	07/16/18 20:14	7440-70-2	
Lithium	16.2	ug/L	10.0	4.6	1	07/03/18 16:20	07/16/18 20:14	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:52	7440-36-0	
Arsenic	2.0	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:52	7440-38-2	
Barium	82.1	ug/L	1.0	0.34	1	07/03/18 10:15	07/13/18 15:52	7440-39-3	
Beryllium	0.28J	ug/L	0.50	0.12	1	07/03/18 10:15	07/13/18 15:52	7440-41-7	
Cadmium	0.15J	ug/L	0.50	0.070	1	07/03/18 10:15	07/13/18 15:52	7440-43-9	
Chromium	5.4	ug/L	1.0	0.19	1	07/03/18 10:15	07/13/18 15:52	7440-47-3	
Cobalt	4.7	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 15:52	7440-48-4	
Lead	3.1	ug/L	1.0	0.12	1	07/03/18 10:15	07/13/18 15:52	7439-92-1	
Molybdenum	0.33J	ug/L	1.0	0.13	1	07/03/18 10:15	07/13/18 15:52	7439-98-7	
Selenium	1.0	ug/L	1.0	0.16	1	07/03/18 10:15	07/13/18 15:52	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/03/18 10:15	07/13/18 15:52	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.037	ug/L	0.20	0.037	1	07/24/18 12:45	07/24/18 16:42	7439-97-6	

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: FIELD BLANK **Lab ID: 60273934004** Collected: 06/28/18 19:25 Received: 07/02/18 08:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	<12.5	ug/L	100	12.5	1	07/03/18 16:20	07/16/18 20:16	7440-42-8	
Calcium	<0.054	mg/L	0.20	0.054	1	07/03/18 16:20	07/16/18 20:16	7440-70-2	
Lithium	<4.6	ug/L	10.0	4.6	1	07/03/18 16:20	07/16/18 20:16	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 16:00	7440-36-0	
Arsenic	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 16:00	7440-38-2	
Barium	<0.34	ug/L	1.0	0.34	1	07/03/18 10:15	07/13/18 16:00	7440-39-3	
Beryllium	<0.12	ug/L	0.50	0.12	1	07/03/18 10:15	07/13/18 16:00	7440-41-7	
Cadmium	<0.070	ug/L	0.50	0.070	1	07/03/18 10:15	07/13/18 16:00	7440-43-9	
Chromium	<0.19	ug/L	1.0	0.19	1	07/03/18 10:15	07/13/18 16:00	7440-47-3	
Cobalt	<0.15	ug/L	1.0	0.15	1	07/03/18 10:15	07/13/18 16:00	7440-48-4	
Lead	<0.12	ug/L	1.0	0.12	1	07/03/18 10:15	07/13/18 16:00	7439-92-1	
Molybdenum	<0.13	ug/L	1.0	0.13	1	07/03/18 10:15	07/13/18 16:00	7439-98-7	
Selenium	<0.16	ug/L	1.0	0.16	1	07/03/18 10:15	07/13/18 16:00	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/03/18 10:15	07/13/18 16:00	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.037	ug/L	0.20	0.037	1	07/24/18 12:45	07/24/18 16:43	7439-97-6	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

QC Batch: 535791

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

METHOD BLANK: 2194873

Matrix: Water

Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.037	0.20	0.037	07/24/18 16:39	

LABORATORY CONTROL SAMPLE: 2194874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2194875 2194876

Parameter	Units	60273934002		2194875		2194876		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	<0.037	5	5	5	4.8	4.9	96	98	75-125	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

QC Batch: 532820 Analysis Method: EPA 6010
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET
 Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

METHOD BLANK: 2182363 Matrix: Water
 Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	07/16/18 19:41	
Calcium	mg/L	<0.054	0.20	0.054	07/16/18 19:41	
Lithium	ug/L	<4.6	10.0	4.6	07/16/18 19:41	

LABORATORY CONTROL SAMPLE: 2182364

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	985	98	80-120	
Calcium	mg/L	10	9.8	98	80-120	
Lithium	ug/L	1000	983	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2182365 2182366

Parameter	Units	60273831006		2182366		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Boron	ug/L	164	1000	1160	1190	100	102	75-125	2	20	
Calcium	mg/L	139000	10	146	150	66	104	75-125	3	20 M1	
Lithium	ug/L	32.5	1000	1090	1120	106	109	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

QC Batch: 532691 Analysis Method: EPA 6020
 QC Batch Method: EPA 3010 Analysis Description: 6020 MET
 Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

METHOD BLANK: 2181851 Matrix: Water
 Associated Lab Samples: 60273934001, 60273934002, 60273934003, 60273934004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	0.15	07/13/18 14:59	
Arsenic	ug/L	<0.15	1.0	0.15	07/13/18 14:59	
Barium	ug/L	<0.34	1.0	0.34	07/13/18 14:59	
Beryllium	ug/L	<0.12	0.50	0.12	07/13/18 14:59	
Cadmium	ug/L	<0.070	0.50	0.070	07/13/18 14:59	
Chromium	ug/L	0.25J	1.0	0.19	07/13/18 14:59	
Cobalt	ug/L	<0.15	1.0	0.15	07/13/18 14:59	
Lead	ug/L	<0.12	1.0	0.12	07/13/18 14:59	
Molybdenum	ug/L	<0.13	1.0	0.13	07/13/18 14:59	
Selenium	ug/L	<0.16	1.0	0.16	07/13/18 14:59	
Thallium	ug/L	<0.14	1.0	0.14	07/13/18 14:59	

LABORATORY CONTROL SAMPLE: 2181852

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.1	100	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	39.8	100	80-120	
Beryllium	ug/L	40	39.5	99	80-120	
Cadmium	ug/L	40	39.9	100	80-120	
Chromium	ug/L	40	40.3	101	80-120	
Cobalt	ug/L	40	38.5	96	80-120	
Lead	ug/L	40	40.1	100	80-120	
Molybdenum	ug/L	40	40.6	101	80-120	
Selenium	ug/L	40	38.1	95	80-120	
Thallium	ug/L	40	38.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2181853 2181854

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Spike Conc.	Result	Spike Conc.	Result							
Antimony	ug/L	<0.15	40	40	38.2	38.3	95	96	75-125	0	20	
Arsenic	ug/L	0.86J	40	40	39.4	39.7	96	97	75-125	1	20	
Barium	ug/L	147	40	40	187	188	100	104	75-125	1	20	
Beryllium	ug/L	<0.12	40	40	37.3	38.0	93	95	75-125	2	20	
Cadmium	ug/L	<0.070	40	40	35.9	35.7	90	89	75-125	0	20	
Chromium	ug/L	1.4	40	40	39.9	39.9	96	96	75-125	0	20	
Cobalt	ug/L	2.9	40	40	37.5	37.6	87	87	75-125	0	20	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Parameter	Units	60273934001		2181853		2181854		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Lead	ug/L	0.48J	40	40	35.2	35.0	87	86	75-125	0	20			
Molybdenum	ug/L	0.39J	40	40	42.3	41.9	105	104	75-125	1	20			
Selenium	ug/L	0.25J	40	40	34.6	35.0	86	87	75-125	1	20			
Thallium	ug/L	<0.14	40	40	35.2	35.1	88	88	75-125	0	20			

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-307 **Lab ID: 60273934001** Collected: 06/28/18 17:40 Received: 07/02/18 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.84 ± 0.691 (0.423) C:NA T:89%	pCi/L	07/18/18 21:10	13982-63-3	
Radium-228	EPA 904.0	0.629 ± 0.402 (0.759) C:81% T:77%	pCi/L	07/24/18 14:59	15262-20-1	
Total Radium	Total Radium Calculation	2.47 ± 1.09 (1.18)	pCi/L	07/25/18 12:58	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-308 **Lab ID: 60273934002** Collected: 06/28/18 19:00 Received: 07/02/18 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.50 ± 0.632 (0.517) C:NA T:89%	pCi/L	07/18/18 21:10	13982-63-3	
Radium-228	EPA 904.0	0.379 ± 0.462 (0.982) C:76% T:81%	pCi/L	07/24/18 14:59	15262-20-1	
Total Radium	Total Radium Calculation	1.88 ± 1.09 (1.50)	pCi/L	07/25/18 13:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Sample: MW-309 **Lab ID: 60273934003** Collected: 06/28/18 20:00 Received: 07/02/18 08:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.83 ± 0.837 (0.738) C:NA T:66%	pCi/L	07/18/18 21:10	13982-63-3	
Radium-228	EPA 904.0	0.534 ± 0.494 (1.01) C:69% T:70%	pCi/L	07/24/18 14:59	15262-20-1	
Total Radium	Total Radium Calculation	2.36 ± 1.33 (1.75)	pCi/L	07/25/18 13:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.117 ± 0.281 (0.544) C:NA T:87%	pCi/L	07/18/18 21:10	13982-63-3	
Radium-228	EPA 904.0	0.212 ± 0.379 (0.829) C:74% T:78%	pCi/L	07/24/18 14:59	15262-20-1	
Total Radium	Total Radium Calculation	0.329 ± 0.660 (1.37)	pCi/L	07/25/18 13:01	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

QC Batch:	305011	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60273934001, 60273934002, 60273934003, 60273934004		

METHOD BLANK:	1492072	Matrix:	Water
Associated Lab Samples:	60273934001, 60273934002, 60273934003, 60273934004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.280 (0.570) C:NA T:86%	pCi/L	07/18/18 20:43	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

QC Batch:	305013	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60273934001, 60273934002, 60273934003, 60273934004		

METHOD BLANK:	1492074	Matrix:	Water
Associated Lab Samples:	60273934001, 60273934002, 60273934003, 60273934004		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.133 ± 0.307 (0.749) C:79% T:76%	pCi/L	07/24/18 14:58	

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QUALIFIERS

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION

Pace Project No.: 60273934

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60273934001	MW-307		533687		
60273934002	MW-308		533687		
60273934003	MW-309		533687		
60273934001	MW-307	EPA 3010	532820	EPA 6010	532862
60273934002	MW-308	EPA 3010	532820	EPA 6010	532862
60273934003	MW-309	EPA 3010	532820	EPA 6010	532862
60273934004	FIELD BLANK	EPA 3010	532820	EPA 6010	532862
60273934001	MW-307	EPA 3010	532691	EPA 6020	532751
60273934002	MW-308	EPA 3010	532691	EPA 6020	532751
60273934003	MW-309	EPA 3010	532691	EPA 6020	532751
60273934004	FIELD BLANK	EPA 3010	532691	EPA 6020	532751
60273934001	MW-307	EPA 7470	535791	EPA 7470	535950
60273934002	MW-308	EPA 7470	535791	EPA 7470	535950
60273934003	MW-309	EPA 7470	535791	EPA 7470	535950
60273934004	FIELD BLANK	EPA 7470	535791	EPA 7470	535950
60273934001	MW-307	EPA 903.1	305011		
60273934002	MW-308	EPA 903.1	305011		
60273934003	MW-309	EPA 903.1	305011		
60273934004	FIELD BLANK	EPA 903.1	305011		
60273934001	MW-307	EPA 904.0	305013		
60273934002	MW-308	EPA 904.0	305013		
60273934003	MW-309	EPA 904.0	305013		
60273934004	FIELD BLANK	EPA 904.0	305013		
60273934001	MW-307	Total Radium Calculation	306982		
60273934002	MW-308	Total Radium Calculation	306983		
60273934003	MW-309	Total Radium Calculation	306983		
60273934004	FIELD BLANK	Total Radium Calculation	306983		

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Sample Condition Upon Receipt

WO#: 60273934



Client Name: SCS Engineers

Courier: FedEx [X] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 4122 49425186 Pace Shipping Label Used? Yes [] No [X]

Custody Seal on Cooler/Box Present: Yes [X] No [] Seals intact: Yes [X] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [] Other [X] zpic

Thermometer Used: T300 Type of Ice: Wet [] Blue None []

Cooler Temperature (°C): As-read 13.2 Corr. Factor 71.2 Corrected 14.4

Date and initials of person examining contents: 7/2/18 HK uz

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes. Rows include Chain of Custody, Short Hold Time, Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match COC, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, and Additional labels attached to 5035A / TX1005 vials.

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Meghan Blodgett Date/Time: 7/2 1400

Comments/ Resolution: pH, TDS, Amms received @ 76 C - Cancel Analyses

Project Manager Review: HWK

Date: 7-2-2018



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

Section A Required Client Information:
 Company: SCS Engineers
 Address: 2830 Dairy Drive
 Madison WI 53718
 Email To: mblodgett@scsengineers.com
 Phone: 608-216-7362 Fax:
 Requested Due Date/TAT: 6/23/2010

Section B Required Project Information:
 Report To: Meghan Blodgett
 Copy To: Tom Karwaski
 Purchase Order No.:
 Project Name: Oitumwa Generating Station
 Project Number: 25216072

Section C Invoice Information:
 Attention: Meghan Blodgett/Jess Valcheff
 Company Name: SCS Engineers
 Address:
 Pace Quote Reference:
 Pace Project Manager: Trudy Gipson 913-563-1405
 Pace Profile #: 6696 Line 2
 Site Location: IA
 STATE:

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

ITEM #	Classification	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB				
1	Void PA6 MW-301		WT G	G	DATE	TIME	DATE	TIME		
2	MW-307		WT G	G	6/23/10	17:40				001
3	MW-308		WT G	G		19:00				001
4	MW-309		WT G	G		20:00				006
5	FIELD BLANK		WT G	G		19:25				001
6										
7										
8										
9										
10	ECRM67001									
11	83									
12	1103									

ADDITIONAL COMMENTS
 Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219
 * Sb-Ag-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl

RELINQUISHED BY / AFFILIATION DATE TIME
 W.C. et / PCSI 7/2/10 08:55

ACCEPTED BY / AFFILIATION DATE TIME
 W.C. et / PCSI 7/2/10 08:55

SAMPLE CONDITIONS
 Received on Ice (Y/N) _____
 Custody Sealed Cooler (Y/N) _____
 Samples Intact (Y/N) _____

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: _____
 SIGNATURE of SAMPLER: _____
 DATE Signed (MM/DD/YYYY): _____



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Company: SCS Engineers Address: 2830 Dairy Drive Madison WI 53718 Email To: mblodgett@scsengineers.com Phone: 608-216-7362 Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: Meghan Blodgett Copy To: Tom Karwaski Purchase Order No.: Project Name: Oitumwa Generating Station Project Number: 25216072		Section C Invoice Information: Attention: Meghan Blodgett/Jess Valcheff Company Name: SCS Engineers Address: Pace Quote Reference: Pace Project Manager: Trudy Gipson 913-563-1405 Pace Profile #: 6696 Line 2	
Section D Required Client Information SAMPLE ID (A-Z, 0-9 / / -) Sample IDs MUST BE UNIQUE			REGULATORY AGENCY <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOILSOLID SL OIL OL WIPE WIP AIR AR OTHER OT TISSUE TS		Site Location STATE: IA			

Page: 2 of 2

ITEM #	Classification	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS	UNPRESERVED	PRESERVATIVES	Y/N	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
		COMPOSITE START	COMPOSITE END/GRAB		DATE	TIME	DATE	TIME						
1	VOID Pkg MW-304								2					
2	MW-307			6/28/18	17:40				2					2801N
3	MW-308				19:00				2					092
4	MW-309				20:00				2					093
5	FIELD BLANK				19:25				2					094
6														
7														
8														
9	FCRM67001													
10														
11														
12														

ADDITIONAL COMMENTS Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	RELINQUISHED BY / AFFILIATION UZ: JF / Pasi	DATE 7/2/18 08:35	TIME 14.4	ACCEPTED BY / AFFILIATION melito	DATE 7/2/18	TIME 14.4	TEMP IN °C Y	RECEIVED ON Y	ICE (Y/N) Y	CUSTODY SEALED Y	COOLER (Y/N) Y	SAMPLES INTACT Y
--	---	-----------------------------	---------------------	--	-----------------------	---------------------	------------------------	-------------------------	-----------------------	----------------------------	--------------------------	----------------------------

DATE SIGNED (MM/DD/YYYY):
 SIGNATURE OF SAMPLER:
 PRINT NAME OF SAMPLER:

August 01, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Generating/25216072.18
Pace Project No.: 60275374

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on July 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60275374001	MW-307	Water	07/18/18 13:40	07/20/18 08:30
60275374002	MW-308	Water	07/18/18 14:50	07/20/18 08:30
60275374003	MW-309	Water	07/18/18 16:30	07/20/18 08:30
60275374004	FIELD BLANK	Water	07/18/18 14:15	07/20/18 08:30

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SAMPLE ANALYTE COUNT

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60275374001	MW-307	SM 2540C	JDA	1	PASI-K
		EPA 9040	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60275374002	MW-308	SM 2540C	JDA	1	PASI-K
		EPA 9040	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60275374003	MW-309	SM 2540C	JDA	1	PASI-K
		EPA 9040	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60275374004	FIELD BLANK	SM 2540C	JDA	1	PASI-K
		EPA 9040	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Sample: MW-307 **Lab ID: 60275374001** Collected: 07/18/18 13:40 Received: 07/20/18 08:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	CLIENT				1		07/18/18 13:40		
Collected Date	07/18/2018				1		07/18/18 13:40		
Collected Time	13:40				1		07/18/18 13:40		
Field pH	6.62	Std. Units	0.10	0.050	1		07/18/18 13:40		
Field Temperature	12.9	deg C	0.50	0.25	1		07/18/18 13:40		
Field Specific Conductance	1718	umhos/cm	1.0	1.0	1		07/18/18 13:40		
Field Oxidation Potential	-416.3	mV			1		07/18/18 13:40		
Oxygen, Dissolved	0.21	mg/L			1		07/18/18 13:40	7782-44-7	
Turbidity	14.94	NTU	1.0	1.0	1		07/18/18 13:40		
Groundwater Elevation	652.27	feet			1		07/18/18 13:40		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1070	mg/L	5.0	5.0	1		07/23/18 15:19		
9040 pH		Analytical Method: EPA 9040							
pH	6.7	Std. Units	0.10	0.10	1		07/23/18 11:16		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	223	mg/L	20.0	9.2	20		07/27/18 16:03	16887-00-6	
Fluoride	0.13J	mg/L	0.20	0.063	1		07/25/18 22:32	16984-48-8	
Sulfate	105	mg/L	10.0	2.4	10		07/25/18 23:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Sample: MW-308 **Lab ID: 60275374002** Collected: 07/18/18 14:50 Received: 07/20/18 08:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method:							
Collected By	CLIENT				1		07/18/18 14:50		
Collected Date	07/18/2018				1		07/18/18 14:50		
Collected Time	14:50				1		07/18/18 14:50		
Field pH	6.73	Std. Units	0.10	0.050	1		07/18/18 14:50		
Field Temperature	12.6	deg C	0.50	0.25	1		07/18/18 14:50		
Field Specific Conductance	1628	umhos/cm	1.0	1.0	1		07/18/18 14:50		
Field Oxidation Potential	-415.4	mV			1		07/18/18 14:50		
Oxygen, Dissolved	0.13	mg/L			1		07/18/18 14:50	7782-44-7	
Turbidity	1.54	NTU	1.0	1.0	1		07/18/18 14:50		
Groundwater Elevation	650.67	feet			1		07/18/18 14:50		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	1080	mg/L	5.0	5.0	1		07/23/18 15:19		
9040 pH		Analytical Method: EPA 9040							
pH	6.8	Std. Units	0.10	0.10	1		07/23/18 11:20		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	158	mg/L	10.0	4.6	10		07/27/18 17:04	16887-00-6	
Fluoride	0.12J	mg/L	0.20	0.063	1		07/25/18 23:29	16984-48-8	
Sulfate	310	mg/L	20.0	4.7	20		07/25/18 23:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Sample: MW-309 **Lab ID: 60275374003** Collected: 07/18/18 16:30 Received: 07/20/18 08:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data Analytical Method:									
Collected By	CLIENT				1		07/18/18 16:30		
Collected Date	07/18/2018				1		07/18/18 16:30		
Collected Time	16:30				1		07/18/18 16:30		
Field pH	7.02	Std. Units	0.10	0.050	1		07/18/18 16:30		
Field Temperature	12.6	deg C	0.50	0.25	1		07/18/18 16:30		
Field Specific Conductance	1501	umhos/cm	1.0	1.0	1		07/18/18 16:30		
Field Oxidation Potential	-432.6	mV			1		07/18/18 16:30		
Oxygen, Dissolved	0.11	mg/L			1		07/18/18 16:30	7782-44-7	
Turbidity	40.38	NTU	1.0	1.0	1		07/18/18 16:30		
Groundwater Elevation	650.69	feet			1		07/18/18 16:30		
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	1030	mg/L	5.0	5.0	1		07/23/18 15:19		
9040 pH Analytical Method: EPA 9040									
pH	7.3	Std. Units	0.10	0.10	1		07/23/18 11:23		H6
9056 IC Anions Analytical Method: EPA 9056									
Chloride	76.4	mg/L	10.0	4.6	10		07/26/18 00:55	16887-00-6	
Fluoride	0.13J	mg/L	0.20	0.063	1		07/26/18 00:12	16984-48-8	
Sulfate	417	mg/L	50.0	11.8	50		07/27/18 17:18	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Sample: FIELD BLANK **Lab ID: 60275374004** Collected: 07/18/18 14:15 Received: 07/20/18 08:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		07/23/18 15:19		
9040 pH		Analytical Method: EPA 9040							
pH	6.5	Std. Units	0.10	0.10	1		07/23/18 11:18		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	<0.46	mg/L	1.0	0.46	1		07/26/18 01:23	16887-00-6	
Fluoride	<0.063	mg/L	0.20	0.063	1		07/26/18 01:23	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		07/26/18 01:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

QC Batch: 535620

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60275374001, 60275374002, 60275374003, 60275374004

METHOD BLANK: 2194427

Matrix: Water

Associated Lab Samples: 60275374001, 60275374002, 60275374003, 60275374004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/23/18 15:19	

LABORATORY CONTROL SAMPLE: 2194428

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	982	98	80-120	

SAMPLE DUPLICATE: 2194429

Parameter	Units	60275297001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	21800	22400	2	10	

SAMPLE DUPLICATE: 2194430

Parameter	Units	60275332001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	274	282	3	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

QC Batch: 535584 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60275374001, 60275374002, 60275374003, 60275374004

SAMPLE DUPLICATE: 2194344

Parameter	Units	60275068001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	8.6	8.6	0	10	H6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

QC Batch: 536034 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60275374001, 60275374002, 60275374003, 60275374004

METHOD BLANK: 2195870 Matrix: Water
 Associated Lab Samples: 60275374001, 60275374002, 60275374003, 60275374004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	07/25/18 20:10	
Fluoride	mg/L	<0.063	0.20	0.063	07/25/18 20:10	
Sulfate	mg/L	<0.24	1.0	0.24	07/25/18 20:10	

LABORATORY CONTROL SAMPLE: 2195871

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.5	101	80-120	
Sulfate	mg/L	5	5.0	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2195872 2195873

Parameter	Units	60275374004 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	<0.46	5	5	5.2	5.2	96	97	80-120	1	15		
Fluoride	mg/L	<0.063	2.5	2.5	2.7	2.8	109	111	80-120	2	15		
Sulfate	mg/L	<0.24	5	5	5.4	5.5	108	110	80-120	2	15		

SAMPLE DUPLICATE: 2195874

Parameter	Units	60275374001 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	mg/L	0.13J	0.11J		15	
Sulfate	mg/L	105	101	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

QC Batch: 536423 Analysis Method: EPA 9056
 QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
 Associated Lab Samples: 60275374001, 60275374002, 60275374003

METHOD BLANK: 2197484 Matrix: Water

Associated Lab Samples: 60275374001, 60275374002, 60275374003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	07/27/18 14:52	
Sulfate	mg/L	<0.24	1.0	0.24	07/27/18 14:52	

LABORATORY CONTROL SAMPLE: 2197485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Sulfate	mg/L	5	4.8	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2197486 2197487

Parameter	Units	2080344002		2197487		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Sulfate	mg/L	481	250	250	723	739	97	103	80-120	2	15

SAMPLE DUPLICATE: 2197488

Parameter	Units	60275374001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	223	215	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Generating/25216072.18

Pace Project No.: 60275374

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60275374001	MW-307		536579		
60275374002	MW-308		536579		
60275374003	MW-309		536579		
60275374001	MW-307	SM 2540C	535620		
60275374002	MW-308	SM 2540C	535620		
60275374003	MW-309	SM 2540C	535620		
60275374004	FIELD BLANK	SM 2540C	535620		
60275374001	MW-307	EPA 9040	535584		
60275374002	MW-308	EPA 9040	535584		
60275374003	MW-309	EPA 9040	535584		
60275374004	FIELD BLANK	EPA 9040	535584		
60275374001	MW-307	EPA 9056	536034		
60275374001	MW-307	EPA 9056	536423		
60275374002	MW-308	EPA 9056	536034		
60275374002	MW-308	EPA 9056	536423		
60275374003	MW-309	EPA 9056	536034		
60275374003	MW-309	EPA 9056	536423		
60275374004	FIELD BLANK	EPA 9056	536034		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60275374



Client Name: SCS Engineers

Courier: FedEx [X] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Xroads [] Client [] Other []

Tracking #: 4368 72766267 Pace Shipping Label Used? Yes [] No [X]

Custody Seal on Cooler/Box Present: Yes [X] No [] Seals intact: Yes [X] No []

Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [] Other [X] zipc

Thermometer Used: T300 Type of Ice: Wet [] Blue [] None []

Cooler Temperature (°C): As-read -0.2 Corr. Factor +1.2 Corrected 1.0

Date and initials of person examining contents: 7/20/18 [initials]

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (PH, WT, etc.)

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 7-20-2018



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:
 Company: SCS Engineers
 Address: 2830 Dairy Drive
 Madison WI 53718
 Email To: mblodgett@scsengineers.com
 Phone: 608-216-7362 Fax:
 Project Name: Oltumwa Generating Station
 Project Number: 25216072.18
 Requested Due Date/ATAT:

Section B Required Project Information:
 Report To: Meghan Blodgett
 Copy To: Tom Karwaski
 Purchase Order No.:
 Project Name: Oltumwa Generating Station
 Project Number: 25216072.18

Section C Invoice Information:
 Attention: Meghan Blodgett/Jess Valcheff
 Company Name: SCS Engineers
 Address:
 Pace Quote Reference:
 Pace Project Manager: Trudy Gipson 913-563-1405
 Pace Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location STATE: IA

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER, DW WATER, WT WASTE WATER, WW PRODUCT, P SOLID, SL C/L WIPE, WP AIR, AR OTHER, OT TISSUE, TS	SAMPLE ID (A-Z, 0-9 / . -) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)																
				COMPOSITE START DATE TIME	COMPOSITE END/GRAB DATE TIME				Y	N	U	U	U	U	U	U	U	U		U	U	U	U	U											
	VOID	MW-301	WT G	XXX	XXX	13:40	2	Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₈ Methanol Other	2010 2010 2010 2010 2010 2010 2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	VOID	MW-302	WT G	XXX	XXX	14:50	2		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	VOID	MW-303	WT G	XXX	XXX	16:30	2		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
	VOID	MW-304	WT G	XXX	XXX	19:15	2		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	VOID	MW-305	WT G	XXX	XXX		2		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	VOID	MW-306	WT G	XXX	XXX		2		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	MW-307		WT G	XXX	XXX		3		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	MW-308		WT G	XXX	XXX		3		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	MW-309		WT G	XXX	XXX		3		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	FIELD BLANK		WT G	XXX	XXX		3		2010	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

ADDITIONAL COMMENTS
 Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219
 *St-As-Ba-Be-Cd-Cr-Cu-Pb-Mn-Se-Tl

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
K2: pf / Pasi	7/20/18	0830		7/20/18	10	Y Y Y

Temp In °C: _____ Received on Ice (Y/N): _____ Custody Sealed (Y/N): _____ Samples Intact (Y/N): _____

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: _____
 SIGNATURE of SAMPLER: _____
 DATE Signed (MM/DD/YYYY): _____

30/2019 - Classification: Internal ECRM 6700183

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

A8 Round 8 Background Sampling, Analytical Laboratory Report

November 05, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Generating Station
Pace Project No.: 60284062

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

Arkansas Drinking Water

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60284062001	MW-307	Water	10/16/18 15:40	10/18/18 09:00
60284062002	MW-308	Water	10/16/18 16:05	10/18/18 09:00
60284062003	MW-309	Water	10/16/18 16:50	10/18/18 09:00
60284062004	FIELD BLANK	Water	10/16/18 16:25	10/18/18 09:00

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SAMPLE ANALYTE COUNT

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60284062001	MW-307	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284062002	MW-308	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284062003	MW-309	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284062004	FIELD BLANK	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	WNM	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Sample: MW-307 **Lab ID: 60284062001** Collected: 10/16/18 15:40 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	Client				1		10/16/18 15:40		
Collected Date	10/16/2018				1		10/16/18 15:40		
Collected Time	15:40				1		10/16/18 15:40		
Field pH	6.54	Std. Units	0.10	0.050	1		10/16/18 15:40		
Field Temperature	14.3	deg C	0.50	0.25	1		10/16/18 15:40		
Field Specific Conductance	1,697	umhos/cm	1.0	1.0	1		10/16/18 15:40		
Oxygen, Dissolved	0.08	mg/L			1		10/16/18 15:40	7782-44-7	
REDOX	-65.7	mV			1		10/16/18 15:40		
Turbidity	14.08	NTU	1.0	1.0	1		10/16/18 15:40		
Groundwater Elevation	654.13	feet			1		10/16/18 15:40		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	195	ug/L	100	12.5	1	10/19/18 11:20	10/19/18 20:39	7440-42-8	
Calcium	222	mg/L	0.20	0.054	1	10/19/18 11:20	10/19/18 20:39	7440-70-2	
Lithium	11.6	ug/L	10.0	4.6	1	10/19/18 11:20	10/19/18 20:39	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.078	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:06	7440-36-0	
Arsenic	0.66J	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:06	7440-38-2	
Barium	145	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:06	7440-39-3	
Beryllium	<0.089	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:06	7440-41-7	
Cadmium	<0.033	ug/L	0.50	0.033	1	10/31/18 15:27	11/04/18 16:04	7440-43-9	
Chromium	0.59J	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:06	7440-47-3	B
Cobalt	4.8	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:06	7440-48-4	
Lead	0.13J	ug/L	1.0	0.13	1	10/31/18 15:27	11/04/18 16:04	7439-92-1	
Molybdenum	<0.57	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:06	7439-98-7	
Selenium	0.13J	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:06	7782-49-2	B
Thallium	<0.099	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:06	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	10/25/18 19:10	10/29/18 11:06	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1070	mg/L	5.0	5.0	1		10/22/18 16:06		
9040 pH									
Analytical Method: EPA 9040									
pH	6.8	Std. Units	0.10	0.10	1		10/26/18 09:27		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	293	mg/L	20.0	5.8	20		10/28/18 23:14	16887-00-6	D6
Fluoride	<0.19	mg/L	0.20	0.19	1		10/28/18 02:19	16984-48-8	
Sulfate	104	mg/L	10.0	2.4	10		10/28/18 00:01	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Sample: MW-308 **Lab ID: 60284062002** Collected: 10/16/18 16:05 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	Client				1		10/16/18 16:05		
Collected Date	10/16/2018				1		10/16/18 16:05		
Collected Time	16:05				1		10/16/18 16:05		
Field pH	6.68	Std. Units	0.10	0.050	1		10/16/18 16:05		
Field Temperature	13.1	deg C	0.50	0.25	1		10/16/18 16:05		
Field Specific Conductance	1,594	umhos/cm	1.0	1.0	1		10/16/18 16:05		
Oxygen, Dissolved	0.08	mg/L			1		10/16/18 16:05	7782-44-7	
REDOX	-80.8	mV			1		10/16/18 16:05		
Turbidity	5.49	NTU	1.0	1.0	1		10/16/18 16:05		
Groundwater Elevation	NM	feet			1		10/16/18 16:05		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	162	ug/L	100	12.5	1	10/19/18 11:20	10/19/18 20:41	7440-42-8	
Calcium	209	mg/L	0.20	0.054	1	10/19/18 11:20	10/19/18 20:41	7440-70-2	
Lithium	13.7	ug/L	10.0	4.6	1	10/19/18 11:20	10/19/18 20:41	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.078	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:08	7440-36-0	
Arsenic	0.44J	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:08	7440-38-2	
Barium	143	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:08	7440-39-3	
Beryllium	<0.089	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:08	7440-41-7	
Cadmium	<0.033	ug/L	0.50	0.033	1	10/31/18 15:27	11/04/18 16:06	7440-43-9	
Chromium	0.27J	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:08	7440-47-3	B
Cobalt	0.15J	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:08	7440-48-4	B
Lead	<0.13	ug/L	1.0	0.13	1	10/31/18 15:27	11/04/18 16:06	7439-92-1	
Molybdenum	<0.57	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:08	7439-98-7	
Selenium	<0.085	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:08	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:08	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	10/25/18 19:10	10/29/18 11:09	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1110	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH									
Analytical Method: EPA 9040									
pH	7.0	Std. Units	0.10	0.10	1		10/26/18 09:29		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	158	mg/L	20.0	5.8	20		10/28/18 00:32	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		10/28/18 23:47	16984-48-8	
Sulfate	311	mg/L	20.0	4.8	20		10/28/18 00:32	14808-79-8	

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Sample: MW-309 **Lab ID: 60284062003** Collected: 10/16/18 16:50 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data									
Analytical Method:									
Collected By	Client				1		10/16/18 16:50		
Collected Date	10/16/2018				1		10/16/18 16:50		
Collected Time	16:50				1		10/16/18 16:50		
Field pH	6.95	Std. Units	0.10	0.050	1		10/16/18 16:50		
Field Temperature	13.5	deg C	0.50	0.25	1		10/16/18 16:50		
Field Specific Conductance	1,464	umhos/cm	1.0	1.0	1		10/16/18 16:50		
Oxygen, Dissolved	0.03	mg/L			1		10/16/18 16:50	7782-44-7	
REDOX	-81.6	mV			1		10/16/18 16:50		
Turbidity	28.27	NTU	1.0	1.0	1		10/16/18 16:50		
Groundwater Elevation	651.61	feet			1		10/16/18 16:50		
6010 MET ICP									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Boron	1280	ug/L	100	12.5	1	10/19/18 11:20	10/19/18 20:44	7440-42-8	
Calcium	139	mg/L	0.20	0.054	1	10/19/18 11:20	10/19/18 20:44	7440-70-2	
Lithium	8.8J	ug/L	10.0	4.6	1	10/19/18 11:20	10/19/18 20:44	7439-93-2	
6020 MET ICPMS									
Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Antimony	<0.078	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:19	7440-36-0	
Arsenic	0.74J	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:19	7440-38-2	
Barium	54.5	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:19	7440-39-3	
Beryllium	<0.089	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:19	7440-41-7	
Cadmium	<0.033	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:19	7440-43-9	
Chromium	1.6	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:19	7440-47-3	
Cobalt	2.7	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:19	7440-48-4	
Lead	0.46J	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:19	7439-92-1	
Molybdenum	<0.57	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:19	7439-98-7	
Selenium	0.24J	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:19	7782-49-2	B
Thallium	<0.099	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:19	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	10/25/18 19:10	10/29/18 11:11	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	1040	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH									
Analytical Method: EPA 9040									
pH	7.2	Std. Units	0.10	0.10	1		10/26/18 09:31		H6
9056 IC Anions									
Analytical Method: EPA 9056									
Chloride	80.6	mg/L	20.0	5.8	20		10/28/18 01:37	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		10/28/18 02:33	16984-48-8	
Sulfate	453	mg/L	50.0	12.0	50		10/29/18 00:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Sample: FIELD BLANK **Lab ID: 60284062004** Collected: 10/16/18 16:25 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP		Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	<12.5	ug/L	100	12.5	1	10/19/18 11:20	10/19/18 20:46	7440-42-8	
Calcium	<0.054	mg/L	0.20	0.054	1	10/19/18 11:20	10/19/18 20:46	7440-70-2	
Lithium	<4.6	ug/L	10.0	4.6	1	10/19/18 11:20	10/19/18 20:46	7439-93-2	
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.078	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:21	7440-36-0	
Arsenic	<0.065	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:21	7440-38-2	
Barium	<0.28	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:21	7440-39-3	
Beryllium	<0.089	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:21	7440-41-7	
Cadmium	<0.033	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:21	7440-43-9	
Chromium	<0.079	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:21	7440-47-3	
Cobalt	<0.062	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:21	7440-48-4	
Lead	<0.13	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:21	7439-92-1	
Molybdenum	<0.57	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:21	7439-98-7	
Selenium	<0.085	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:21	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:21	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	10/25/18 19:10	10/29/18 11:13	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	9.0	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH		Analytical Method: EPA 9040							
pH	6.5	Std. Units	0.10	0.10	1		10/26/18 09:33		H6
9056 IC Anions		Analytical Method: EPA 9056							
Chloride	<0.29	mg/L	1.0	0.29	1		10/28/18 03:16	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		10/28/18 03:16	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		10/28/18 03:16	14808-79-8	

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 551764 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

METHOD BLANK: 2262621 Matrix: Water
 Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	10/29/18 10:32	

LABORATORY CONTROL SAMPLE: 2262622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2262623 2262624

Parameter	Units	60284145001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	ND		5	5	4.8	4.8	95	96	75-125	1	20			

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 550414 Analysis Method: EPA 6010

QC Batch Method: EPA 3010 Analysis Description: 6010 MET

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

METHOD BLANK: 2256930 Matrix: Water

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	10/19/18 19:46	
Calcium	mg/L	<0.054	0.20	0.054	10/19/18 19:46	
Lithium	ug/L	<4.6	10.0	4.6	10/19/18 19:46	

LABORATORY CONTROL SAMPLE: 2256931

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	917	92	80-120	
Calcium	mg/L	10	9.4	94	80-120	
Lithium	ug/L	1000	906	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2256932 2256933

Parameter	Units	60283505006		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Boron	ug/L	705	1000	1000	1640	1650	94	94	75-125	0	20		
Calcium	mg/L	452000	10	10	449	456	-29	38	75-125	1	20	M1	
Lithium	ug/L	163	1000	1000	1150	1140	99	98	75-125	1	20		

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60284062

QC Batch: 552660 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

METHOD BLANK: 2266473 Matrix: Water
Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.11J	1.0	0.078	11/01/18 18:50	
Arsenic	ug/L	<0.065	1.0	0.065	11/04/18 15:59	
Barium	ug/L	<0.28	1.0	0.28	11/04/18 15:59	
Beryllium	ug/L	<0.089	0.50	0.089	11/01/18 18:50	
Cadmium	ug/L	<0.033	0.50	0.033	11/04/18 15:59	
Chromium	ug/L	0.082J	1.0	0.079	11/01/18 18:50	
Cobalt	ug/L	0.20J	1.0	0.062	11/01/18 18:50	
Lead	ug/L	<0.13	1.0	0.13	11/04/18 15:59	
Molybdenum	ug/L	<0.57	1.0	0.57	11/01/18 18:50	
Selenium	ug/L	0.20J	1.0	0.085	11/01/18 18:50	
Thallium	ug/L	<0.099	1.0	0.099	11/01/18 18:50	

LABORATORY CONTROL SAMPLE: 2266474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	42.4	106	80-120	
Arsenic	ug/L	40	43.3	108	80-120	
Barium	ug/L	40	41.4	104	80-120	
Beryllium	ug/L	40	41.2	103	80-120	
Cadmium	ug/L	40	36.6	92	80-120	
Chromium	ug/L	40	40.7	102	80-120	
Cobalt	ug/L	40	41.2	103	80-120	
Lead	ug/L	40	35.7	89	80-120	
Molybdenum	ug/L	40	42.6	106	80-120	
Selenium	ug/L	40	42.1	105	80-120	
Thallium	ug/L	40	38.7	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2266475 2266476

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Spike Conc.	Spike Conc.	Result	Result							
Antimony	ug/L	<0.078	40	40	39.7	39.7	99	99	75-125	0	20	
Arsenic	ug/L	0.44J	40	40	43.1	43.1	107	107	75-125	0	20	
Barium	ug/L	143	40	40	186	188	107	112	75-125	1	20	
Beryllium	ug/L	<0.089	40	40	37.4	37.7	94	94	75-125	1	20	
Cadmium	ug/L	<0.033	40	40	35.6	35.8	89	90	75-125	1	20	
Chromium	ug/L	0.27J	40	40	37.0	37.7	92	94	75-125	2	20	
Cobalt	ug/L	0.15J	40	40	37.8	38.0	94	95	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Parameter	Units	2266475		2266476		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60284062002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Lead	ug/L	<0.13	40	40	33.9	33.9	85	85	75-125	0	20		
Molybdenum	ug/L	<0.57	40	40	43.1	43.2	107	107	75-125	0	20		
Selenium	ug/L	<0.085	40	40	38.5	38.4	96	96	75-125	0	20		
Thallium	ug/L	<0.099	40	40	33.7	33.6	84	84	75-125	0	20		

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 550935

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

METHOD BLANK: 2259350

Matrix: Water

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	10/22/18 16:06	

LABORATORY CONTROL SAMPLE: 2259351

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 2259352

Parameter	Units	60284115001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5420	5430	0	10	

SAMPLE DUPLICATE: 2259353

Parameter	Units	60284115002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8.0	5.5	37	10	D6

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 551778 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

SAMPLE DUPLICATE: 2262778

Parameter	Units	60283898001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	4.3	4.3	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 551837

Analysis Method: EPA 9056

QC Batch Method: EPA 9056

Analysis Description: 9056 IC Anions

Associated Lab Samples: 60284062001, 60284062002, 60284062003

METHOD BLANK: 2263033

Matrix: Water

Associated Lab Samples: 60284062001, 60284062002, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/27/18 11:47	
Sulfate	mg/L	<0.24	1.0	0.24	10/27/18 11:47	

LABORATORY CONTROL SAMPLE: 2263034

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2263035 2263036

Parameter	Units	60283868001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	1.8	5	5	6.0	7.1	85	106	80-120	16	15	R1	
Sulfate	mg/L	3.7	5	5	8.1	9.3	88	113	80-120	15	15		

SAMPLE DUPLICATE: 2263037

Parameter	Units	2086025002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6480	6600	2	15	
Sulfate	mg/L	1240	1260	2	15	

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 552042 Analysis Method: EPA 9056

QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions

Associated Lab Samples: 60284062001, 60284062003, 60284062004

METHOD BLANK: 2264261 Matrix: Water

Associated Lab Samples: 60284062001, 60284062003, 60284062004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/28/18 00:25	
Fluoride	mg/L	<0.19	0.20	0.19	10/28/18 00:25	
Sulfate	mg/L	<0.24	1.0	0.24	10/28/18 00:25	

LABORATORY CONTROL SAMPLE: 2264262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	80-120	
Fluoride	mg/L	2.5	2.6	104	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station

Pace Project No.: 60284062

QC Batch: 552047

Analysis Method: EPA 9056

QC Batch Method: EPA 9056

Analysis Description: 9056 IC Anions

Associated Lab Samples: 60284062001, 60284062002, 60284062003

METHOD BLANK: 2264280

Matrix: Water

Associated Lab Samples: 60284062001, 60284062002, 60284062003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/28/18 21:52	
Fluoride	mg/L	<0.19	0.20	0.19	10/28/18 21:52	
Sulfate	mg/L	<0.24	1.0	0.24	10/28/18 21:52	

LABORATORY CONTROL SAMPLE: 2264281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	4.8	97	80-120	

SAMPLE DUPLICATE: 2264284

Parameter	Units	60284062001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	293	238	21	15	D6

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Generating Station

Pace Project No.: 60284062

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Generating Station

Pace Project No.: 60284062

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60284062001	MW-307		551587		
60284062002	MW-308		551587		
60284062003	MW-309		551587		
60284062001	MW-307	EPA 3010	550414	EPA 6010	550619
60284062002	MW-308	EPA 3010	550414	EPA 6010	550619
60284062003	MW-309	EPA 3010	550414	EPA 6010	550619
60284062004	FIELD BLANK	EPA 3010	550414	EPA 6010	550619
60284062001	MW-307	EPA 3010	552660	EPA 6020	552780
60284062002	MW-308	EPA 3010	552660	EPA 6020	552780
60284062003	MW-309	EPA 3010	552660	EPA 6020	552780
60284062004	FIELD BLANK	EPA 3010	552660	EPA 6020	552780
60284062001	MW-307	EPA 7470	551764	EPA 7470	551766
60284062002	MW-308	EPA 7470	551764	EPA 7470	551766
60284062003	MW-309	EPA 7470	551764	EPA 7470	551766
60284062004	FIELD BLANK	EPA 7470	551764	EPA 7470	551766
60284062001	MW-307	SM 2540C	550935		
60284062002	MW-308	SM 2540C	550935		
60284062003	MW-309	SM 2540C	550935		
60284062004	FIELD BLANK	SM 2540C	550935		
60284062001	MW-307	EPA 9040	551778		
60284062002	MW-308	EPA 9040	551778		
60284062003	MW-309	EPA 9040	551778		
60284062004	FIELD BLANK	EPA 9040	551778		
60284062001	MW-307	EPA 9056	551837		
60284062001	MW-307	EPA 9056	552042		
60284062001	MW-307	EPA 9056	552047		
60284062002	MW-308	EPA 9056	551837		
60284062002	MW-308	EPA 9056	552047		
60284062003	MW-309	EPA 9056	551837		
60284062003	MW-309	EPA 9056	552042		
60284062003	MW-309	EPA 9056	552047		
60284062003	MW-309	EPA 9056	552047		
60284062004	FIELD BLANK	EPA 9056	552042		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60284062



Client Name: SCS

Courier: FedEx UPS VIA Clay PEX ECI Pace Xroads Client Other

Tracking #: 4542 2783 6407 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other TPIC

Thermometer Used: T-299 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.3 Corr. Factor +0.1 Corrected 1.4

Date and initials of person examining contents: 10/18/18 HF

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>Ph</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Hank
02:34 pm, Oct 18, 2018
Kapka



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: _____ of _____

Section A
 Required Client Information:
 Company: SCS Engineers
 Address: 2830 Dairy Drive
 Madison WI 53718
 Email To: mblodgett@scsengineers.com
 Phone: 608-216-7362
 Fax: _____

Section B
 Required Project Information:
 Report To: Meghan Blodgett
 Copy To: Tom Karwaski
 Purchase Order No.: _____
 Project Name: Ottumwa Generating Station
 Project Number: 25216072.18

Section C
 Invoice Information:
 Attention: Meghan Blodgett/Jess Valcheff
 Company Name: SCS Engineers
 Address: _____
 Pace Quote Reference: _____
 Pace Project Manager: Hank Kapka 913-563-1404
 Pace Profile #: 6696 Line 2

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER _____

Site Location: _____
 STATE: IA

ITEM #	Valid Matrix Codes MATRIX CODE DIV WT WATER WW WASTE WATER PRODUCT P SOL/SOLID OIL WIPE AIR OTHER TISSUE TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ O ₂ Methanol Other	Analysis Test 5010 Total Metals: B-Ca-Li 5020 Total Metals * 7470 Total Hg 9056 Chloride-Fluoride-Sulfate 2540C TDS 9040 pH	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.										
			DATE	TIME							DATE	TIME								
1	MW-307	WT G	10/16/18	15:40	14.2	3	1	2	X	X	X	X	X	X	X	X	X	X	X	02B4062
2	MW-308	WT G	10/16/18	16:05	13.1	3	1	2	X	X	X	X	X	X	X	X	X	X	X	02
3	MW-309	WT G	10/16/18	16:50	13.5	3	1	2	X	X	X	X	X	X	X	X	X	X	X	023
4	FIELD BLANK	WT G	10/16/18	16:25	-	3	1	2	X	X	X	X	X	X	X	X	X	X	X	024
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS
 Relinquished by / Affiliation: Paula Grohn SCS
 Date: 10/17/18
 Time: 16:30
 Accepted by / Affiliation: Jess Valcheff
 Date: 10/18/18
 Time: 0900

Temp in °C: _____
 Received on: _____
 Custody Sealed: _____
 Cooler (Y/N): _____
 Samples Intact: _____

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Paul A. Grohn
 SIGNATURE of SAMPLER: *Paul A. Grohn*
 DATE Signed (MM/DD/YYYY): _____

November 05, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Generating Station
Pace Project No.: 60284237

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engineers



REPORT OF LABORATORY ANALYSIS

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08/30/2019 - Classification: Internal - ECRM6700183

CERTIFICATIONS

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

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08/30/2019 - Classification: Internal - ECRM6700183

SAMPLE SUMMARY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60284212008	MW-307	Water	10/16/18 15:40	10/18/18 09:00
60284212009	MW-308	Water	10/16/18 16:05	10/18/18 09:00
60284212010	MW-309	Water	10/16/18 16:50	10/18/18 09:00
60284212011	FIELD BLANK	Water	10/16/18 16:25	10/18/18 09:00

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SAMPLE ANALYTE COUNT

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60284212008	MW-307	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212009	MW-308	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212010	MW-309	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212011	FIELD BLANK	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Sample: MW-307 **Lab ID: 60284212008** Collected: 10/16/18 15:40 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.11 ± 0.788 (0.576) C:NA T:98%	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	0.991 ± 0.372 (0.542) C:82% T:94%	pCi/L	10/31/18 12:30	15262-20-1	
Total Radium	Total Radium Calculation	3.10 ± 1.16 (1.12)	pCi/L	11/05/18 15:39	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Sample: MW-308 **Lab ID: 60284212009** Collected: 10/16/18 16:05 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.44 ± 0.680 (0.673) C:NA T:97%	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	1.41 ± 0.486 (0.684) C:82% T:83%	pCi/L	10/31/18 12:32	15262-20-1	
Total Radium	Total Radium Calculation	2.85 ± 1.17 (1.36)	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Sample: MW-309 **Lab ID: 60284212010** Collected: 10/16/18 16:50 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.09 ± 0.721 (0.949) C:NA T:86%	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	1.11 ± 0.506 (0.864) C:80% T:75%	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	2.20 ± 1.23 (1.81)	pCi/L	11/05/18 15:39	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Sample: FIELD BLANK **Lab ID: 60284212011** Collected: 10/16/18 16:25 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.754 ± 0.500 (0.584) C:NA T:100%	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	0.651 ± 0.377 (0.695) C:80% T:85%	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	1.41 ± 0.877 (1.28)	pCi/L	11/05/18 15:39	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

QC Batch: 317855 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60284212008, 60284212009, 60284212010, 60284212011

METHOD BLANK: 1550520 Matrix: Water

Associated Lab Samples: 60284212008, 60284212009, 60284212010, 60284212011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.00911 ± 0.260 (0.613) C:79% T:81%	pCi/L	10/31/18 12:30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Generating Station

Pace Project No.: 60284237

QC Batch:	317851	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60284212008, 60284212009, 60284212010, 60284212011		

METHOD BLANK:	1550514	Matrix:	Water
Associated Lab Samples:	60284212008, 60284212009, 60284212010, 60284212011		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.453 ± 0.460 (0.696) C:NA T:92%	pCi/L	11/01/18 10:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: Ottumwa Generating Station

Pace Project No.: 60284237

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Generating Station

Pace Project No.: 60284237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60284212008	MW-307	EPA 903.1	317851		
60284212009	MW-308	EPA 903.1	317851		
60284212010	MW-309	EPA 903.1	317851		
60284212011	FIELD BLANK	EPA 903.1	317851		
60284212008	MW-307	EPA 904.0	317855		
60284212009	MW-308	EPA 904.0	317855		
60284212010	MW-309	EPA 904.0	317855		
60284212011	FIELD BLANK	EPA 904.0	317855		
60284212008	MW-307	Total Radium Calculation	319267		
60284212009	MW-308	Total Radium Calculation	319267		
60284212010	MW-309	Total Radium Calculation	319267		
60284212011	FIELD BLANK	Total Radium Calculation	319267		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60284237



Client Name: SCS Engineers

Courier: FedEx UPS VOA Clay PEX ECI Pace Xroads Client Other

Tracking #: 4542 2783 10381 10451 Pace Shipping Label Used? Yes No

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-297 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 23.0, Corr. Factor -0.2 Corrected 22.8, 23.8 Date and initials of person examining contents: HC 10/19

Temperature should be above freezing to 6°C 24.80

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: HWK Date: 10-19-2018



CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Company: SCS Engineers Address: 2830 Dairy Drive Madison WI 53718 Email To: mblodgett@scsengineers.com Phone: 608-216-7362 Fax: Requested Due Date/TAT:		Section B Required Project Information: Report To: Meghan Blodgett Copy To: Tom Karwaski Purchase Order No.: Project Name: Ottumwa Generating Station Project Number: 25216072		Section C Invoice Information: Attention: Meghan Blodgett/Jess Valcheff Company Name: SCS Engineers Address: Pace Quote Reference: Pace Project Manager: Hank Kapka 913-563-1404 Pace Profile #: 6696 Line 2	
REGULATORY AGENCY <input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> USI <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		Site Location STATE: IA			

Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRECIPITATION P SOIL SOLID S CUI NIP AIR A OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAVE C=COMP)	COLLECTED		# OF CONTAINERS	Preservatives H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Requested Analysis Filtered (Y/N)	Temp in °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
				DATE	TIME							
MW-307		WT	G	10/16/18	15:40	2		Y	238 N			
MW-308		WT	G	10/16/18	16:05	2		Y	238 N			
MW-309		WT	G	10/16/18	16:50	2		Y	238 N			
FIELD BLANK		WT	G	10/16/18	16:25	2		Y	238 N			

ADDITIONAL COMMENTS Ship To: 4608 Loiret Boulevard, Lenexa, KS 66219 Paul A. Smith SCS 10/17/18 16:30 Paul A. Grewer 10/17/18		RELINQUISHED BY / AFFILIATION DATE TIME 10/18/1909:00 228 N 238 N		ACCEPTED BY / AFFILIATION DATE TIME 10/17/18 16:30 10/17/18		SAMPLE CONDITIONS Temp in °C Received on Ice (Y/N) Custody Sealed (Y/N) Samples Intact (Y/N)	
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