Environmental Consultants
and Contractors

2830 Dairy Drive
Madison, WI 53718-6751

608 224-2830
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SCS ENGINEERS

Februrary 27, 2018
File No. 25216073.00

Mr. Rob Saunders
Ottumwa Generating Station
20775 Power Plant Road
Ottumwa, IA 52501

Subject: Revised 2017 Annual Monitoring and Corrective Action Report
Interstate Power and Light Company Ottumwa-Midland Landfill

Dear Mr. Saunders:

This letter documents a revision to the 2017 Annual Monitoring and Corrective Action Report for the Interstate Power and Light Company (IPL) Ottumwa-Midland Landfill (OML). One laboratory report was inadvertently omitted from the original version of this report and has been added to Appendix A in the revised version. No revisions to the report text were required. The specific revision was:

- Updated report Appendix A7 to include a missing radium laboratory report associated with the July 2017 resampling for the June 2017 sampling event.

Sincerely,

Sherren C. Clark
Project Director
SCS ENGINEERS

Thomas J. Karwoski
Senior Project Manager
SCS ENGINEERS

Attachment: Revised 2017 Annual Monitoring and Corrective Action Report

TK/AJR/NK

cc: Matt Hanson, Ottumwa Generating Station
Jeff Maxted, Alliant Energy

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SCS ENGINEERS

2017 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Midland Landfill
Ottumwa, Iowa

Prepared for:

Alliant Energy

Prepared by:

SCS ENGINEERS
2830 Dairy Drive
Madison, Wisconsin 53718-6751
(608) 224-2830

January 31, 2018
(Revised: February 27, 2018)
File No. 25216073.17

2017 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Midland Landfill
Ottumwa, Iowa

Prepared for:

Alliant Energy

Prepared by:

SCS ENGINEERS
2830 Dairy Drive
Madison, Wisconsin 53718-6751
(608) 224-2830

January 31, 2018
(Revised: February 27, 2018)
File No. 25216073.17

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Figure

Appendix A – Analytical Laboratory Reports

I:\25216073.00\Reports\2017 Annual report\2017 Annual CCR GW Report OML LF_180227_Rev.Final.docx

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1.0 INTRODUCTION

This 2017 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). Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2017 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from May 5, 2016 through December 31, 2017. May 4, 2016 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 at the Ottumwa Midland Landfill (OML) is a multi-unit system that monitors two existing CCR landfills, the Existing Landfill and the Phase 1 Expansion, as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two upgradient and three downgradient monitoring wells.

2.0 §257.90(e) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. 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:*

2.1 §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 with an aerial image showing OML and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 1**. Other CCR units are also presented on **Figure 1**.

2.2 §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 OML in 2017. Monitoring wells MW-301 and MW-302 were installed between November 24 and December 3, 2015, at OML, and are downgradient wells in the monitoring well network. The third downgradient monitoring well, MW-303, was installed on April 11-26, 2016. The upgradient monitoring wells, MW-102M and MW-122M, were installed prior to October 2015.

2.3 §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. Background sampling began in April 2016 and concluded in August 2017. 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 background and 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 **Appendices A1** through **A8**.

Detection monitoring was initiated at the site on October 17, 2017. The date of sample collection, field measurements, and the analytical results of the analytical laboratory analyses are provided in **Appendix A9**.

Assessment monitoring has not been initiated for OML.

2.4 §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);

Following completion of eight background groundwater monitoring events, detection monitoring was initiated in October 2017. There were no transitions between monitoring programs or statistically significant increase (SSI) determinations completed in 2017.

2.5 §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 2017 Annual Groundwater Monitoring and Corrective Action Report for the Ottumwa Landfill.

2.5.1 §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. The groundwater monitoring and corrective action program is currently in detection monitoring.

Summary of Key Actions Completed. Collection of background groundwater quality data was completed, and the initial detection monitoring sampling and analysis event was completed.

Description of Any Problems Encountered. Problems encountered were:

- The low-flow pump bladder for well MW-303 broke during the June 2017 sampling event. The pump was repaired by the manufacturer and a sample was obtained from the well.
- Background wells MW-102M and MW-122 purge dry and recover slowly. The samples are collected by purging with the sampling pump and collected the samples the next day. This alternate sampling method is described in the site sampling plan.
- Field parameters were not collected at upgradient wells MW-102M and MW-122 during the first two background sampling rounds due to slow recovery of the upgradient wells.

Discussion of Actions to Resolve the Problems. See above**.** All problems were resolved, and the problems are not believed to have affected the samples that were collected.

Projection of Key Activities for the Upcoming Year (2018):

- Statistical evaluation and determination of any SSIs for November 2017 monitoring event (by 1/15/18)

- If an SSI is determined, then within 90 days either
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program
- Two semi-annual groundwater sampling and analysis events (April and October 2018)

2.5.2 §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.

2.5.3 §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 2017.

2.5.4 §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.

2.5.5 §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 2017.

2.5.6 §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 2017.

2.5.7 §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-Ottumwa Midland Landfill /
SCS Engineers Project #25216073

Sample Dates	Downgradient Wells			Background Wells	
	MW-301	MW-302	MW-303	MW-102M	MW-122M
5/4-5/2016	B	B	B	B	B
6/22/2016	B	B	B	B	B
8/9-10/2016	B	B	B	B	B
10/26/2016	B	B	B	B	B
1/17-18/2017	B	B	B	B	B
4/19-20/2017	B	B	B	B	B
6/20-7/19/2017	B	B	B	B	B
8/22-23/2017	B	B	B	B	B
11/7-8/2017	D	D	D	D	D
Total Samples	9	9	9	9	9

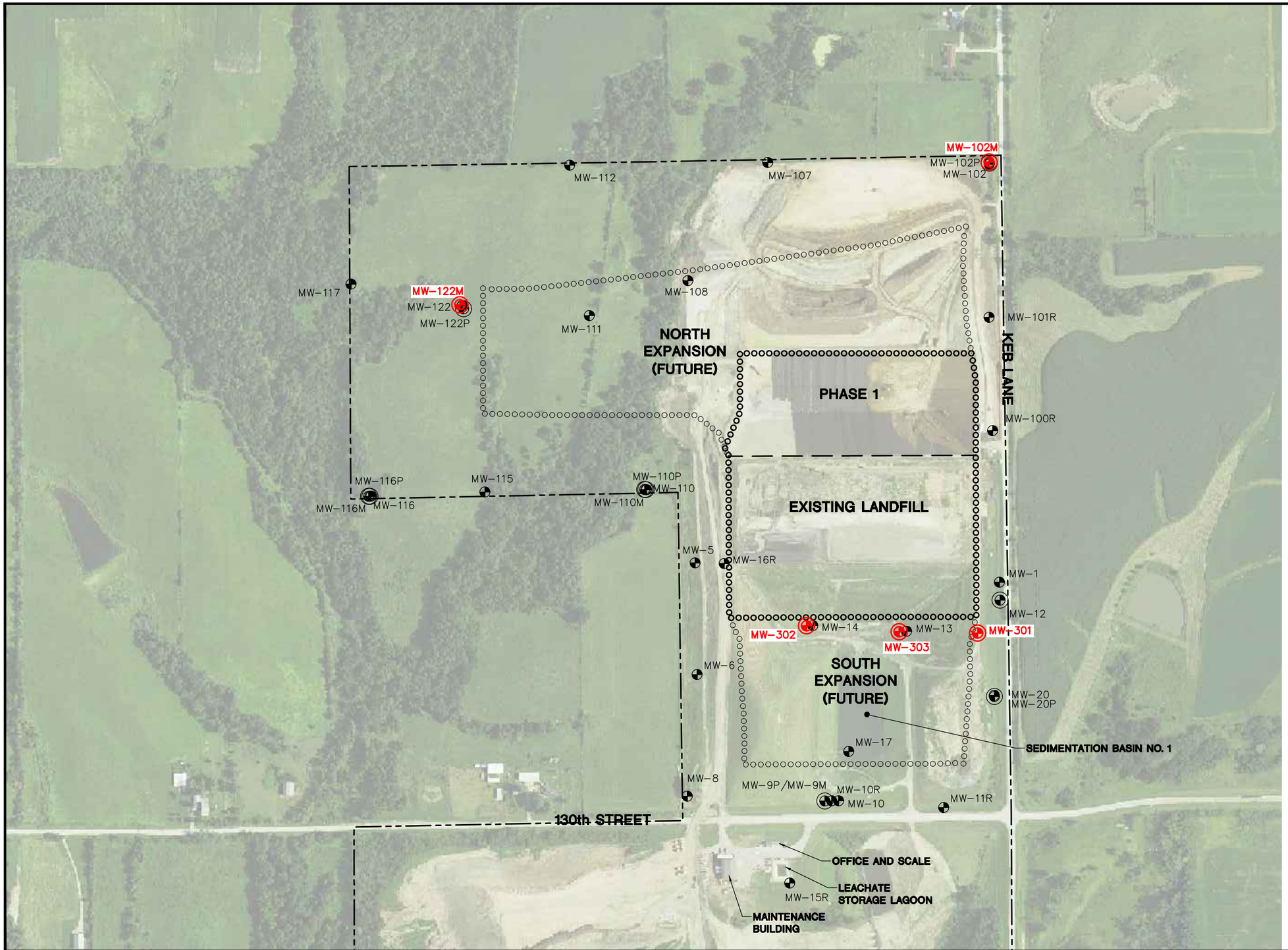
Abbreviations:
B = Background Sample
D = Required by Detection Monitoring Program

Created by: NDK Date: 1/4/2018
Last revision by: NDK Date: 1/8/2018
Checked by: JD Date: 1/8/2018

I:\25216073.00\Reports\2017 Annual report\[GW_Samples_Summary_Table_OML-1.xlsx]GW Summary

FIGURE 1

Site Plan and Monitoring Well Locations



LEGEND

- APPROXIMATE PROPERTY LINE
- EXISTING WASTE LIMITS
- NORTH EXPANSION AREA
- MONITORING WELL
- PIEZOMETER
- CCR RULE PIEZOMETER

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. IMAGE DATED JULY 31, 2014.
2. PROPERTY LINE SOUTH OF 130TH STREET FROM SURVEY MAP PREPARED BY GARDEN & ASSOCIATES, OSKALOOSA, IOWA, DATED DECEMBER 20, 1988.
3. PROPERTY LINE NORTH OF 130TH STREET FROM PLAT OF SURVEY MAP PREPARED BY SCS ENGINEERS, MADISON, WISCONSIN, DATED FEBRUARY 20, 2013.
4. EXISTING LIMITS OF WASTE ARE APPROXIMATE.
5. MONITORING WELLS MW-301 AND MW-302 WERE INSTALLED BY CASCADE DRILLING BETWEEN NOVEMBER 16, 2015, AND DECEMBER 3, 2015.
6. MONITORING WELL MW-303 WAS INSTALLED BY TEAM SERVICES BETWEEN APRIL 11, 2016 AND APRIL 26, 2016.
7. MONITORING WELLS MW-301 THROUGH MW-303 WERE SURVEYED BY FRENCH-RENEKER-ASSOCIATES ON MAY 19, 2016.

N

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25216073.00	DRAWN BY:	JB/KP
DRAWN:	11/17/11	CHECKED BY:	MDB
REVISED:	10/10/16	APPROVED BY:	

ENGINEER: SCS ENGINEERS
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 MIDLAND LANDFILL
OTTUMWA, IOWA

MONITORING WELL LOCATION MAP

FIGURE 1

I:\25216073.00\Drawings\CCR Rule Piezometers.dwg, 10/10/2016 4:50:24 PM

APPENDIX A

A1 Round 1 Background Sampling, Analytical Laboratory Report
A2 Round 2 Background Sampling, Analytical Laboratory Report
A3 Round 3 Background Sampling, Analytical Laboratory Report
A4 Round 4 Background Sampling, Analytical Laboratory Report
A5 Round 5 Background Sampling, Analytical Laboratory Report
A6 Round 6 Background Sampling, Analytical Laboratory Report
A7 Round 7 Background Sampling, Analytical Laboratory Report
A8 Round 8 Background Sampling, Analytical Laboratory Report
A9 Fall 2017 Detection Sampling, Analytical Laboratory Report

A1 Round 1 Background Sampling, Analytical Laboratory Report

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 23, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on May 06, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60218510001	**MW-301**	Water	05/04/16 10:20	05/06/16 09:00
60218510002	**MW-302**	Water	05/04/16 12:15	05/06/16 09:00
60218510003	**MW-303**	Water	05/04/16 14:15	05/06/16 09:00
60218510004	**MW-102M**	Water	05/04/16 17:20	05/06/16 09:00
60218510005	**MW-122M**	Water	05/05/16 07:10	05/06/16 09:00
60218510006	**FIELD BLANK**	Water	05/04/16 15:00	05/06/16 09:00

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60218510001	**MW-301**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	AGO, HAC	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K
60218510002	**MW-302**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K
60218510003	**MW-303**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K
60218510004	**MW-102M**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K
60218510005	**MW-122M**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K
60218510006	**FIELD BLANK**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	CRS	1	PASI-K
		EPA 9056	OL	3	PASI-K

Pace Analytical Services, Inc.
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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: MW-301 **Lab ID: 60218510001** Collected: 05/04/16 10:20 Received: 05/06/16 09:00 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	**2280**	ug/L	500	250	5	05/06/16 15:50	05/09/16 11:02	7440-42-8	
Calcium	**596**	mg/L	0.50	0.041	5	05/06/16 15:50	05/09/16 11:02	7440-70-2	
Lithium	**274**	ug/L	50.0	24.5	5	05/06/16 15:50	05/09/16 11:02	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	10.0	0.58	10	05/06/16 15:50	05/21/16 13:58	7440-36-0	D3
Arsenic	ND	ug/L	10.0	1.0	10	05/06/16 15:50	05/21/16 13:58	7440-38-2	D3
Barium	**28.1**	ug/L	10.0	1.4	10	05/06/16 15:50	05/21/16 13:58	7440-39-3	B
Beryllium	ND	ug/L	5.0	0.80	10	05/06/16 15:50	05/21/16 13:58	7440-41-7	D3
Cadmium	ND	ug/L	5.0	0.29	10	05/06/16 15:50	05/21/16 13:58	7440-43-9	D3
Chromium	ND	ug/L	10.0	3.4	10	05/06/16 15:50	05/21/16 13:58	7440-47-3	D3
Cobalt	ND	ug/L	10.0	5.0	10	05/06/16 15:50	05/21/16 13:58	7440-48-4	D3
Lead	ND	ug/L	10.0	1.9	10	05/06/16 15:50	05/21/16 13:58	7439-92-1	D3
Molybdenum	**4.6J**	ug/L	10.0	1.0	10	05/06/16 15:50	05/21/16 13:58	7439-98-7	
Selenium	ND	ug/L	10.0	1.8	10	05/06/16 15:50	05/21/16 13:58	7782-49-2	D3
Thallium	ND	ug/L	10.0	5.0	10	05/06/16 15:50	05/21/16 13:58	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:17	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**7640**	mg/L	5.0	5.0	1		05/11/16 13:20		2e
Total Dissolved Solids	**6260**	mg/L	5.0	5.0	1		05/13/16 16:25		1e,H1
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**42.4**	mg/L	5.0	2.5	5		05/10/16 20:43	16887-00-6	
Fluoride	**0.68**	mg/L	0.20	0.073	1		05/10/16 20:28	16984-48-8	
Sulfate	**5160**	mg/L	500	124	500		05/10/16 18:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: MW-302 **Lab ID: 60218510002** Collected: 05/04/16 12:15 Received: 05/06/16 09:00 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	**853**	ug/L	100	50.0	1	05/06/16 15:50	05/09/16 11:05	7440-42-8	
Calcium	**72.1**	mg/L	0.10	0.0081	1	05/06/16 15:50	05/09/16 11:05	7440-70-2	
Lithium	**81.1**	ug/L	10.0	4.9	1	05/06/16 15:50	05/09/16 11:05	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.12J**	ug/L	1.0	0.058	1	05/06/16 15:50	05/21/16 14:11	7440-36-0	
Arsenic	**0.19J**	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:11	7440-38-2	
Barium	**39.3**	ug/L	1.0	0.14	1	05/06/16 15:50	05/21/16 14:11	7440-39-3	
Beryllium	**0.22J**	ug/L	0.50	0.080	1	05/06/16 15:50	05/21/16 14:11	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	05/06/16 15:50	05/21/16 14:11	7440-43-9	
Chromium	**5.5**	ug/L	1.0	0.34	1	05/06/16 15:50	05/21/16 14:11	7440-47-3	
Cobalt	**1.1**	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:11	7440-48-4	
Lead	**1.1**	ug/L	1.0	0.19	1	05/06/16 15:50	05/21/16 14:11	7439-92-1	
Molybdenum	**0.32J**	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:11	7439-98-7	
Selenium	**0.19J**	ug/L	1.0	0.18	1	05/06/16 15:50	05/21/16 14:11	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:11	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:19	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**784**	mg/L	5.0	5.0	1		05/11/16 13:23		
9040 pH	Analytical Method: EPA 9040								
pH	**7.3**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**9.2**	mg/L	1.0	0.50	1		05/10/16 20:57	16887-00-6	
Fluoride	**1.1**	mg/L	0.20	0.073	1		05/10/16 20:57	16984-48-8	
Sulfate	**201**	mg/L	20.0	5.0	20		05/10/16 18:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: MW-303 **Lab ID: 60218510003** Collected: 05/04/16 14:15 Received: 05/06/16 09:00 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	**3510**	ug/L	1000	500	10	05/06/16 15:50	05/09/16 11:16	7440-42-8	
Calcium	**686**	mg/L	1.0	0.081	10	05/06/16 15:50	05/09/16 11:16	7440-70-2	
Lithium	**289**	ug/L	100	48.9	10	05/06/16 15:50	05/09/16 11:16	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	10.0	0.58	10	05/06/16 15:50	05/21/16 14:16	7440-36-0	D3
Arsenic	ND	ug/L	10.0	1.0	10	05/06/16 15:50	05/21/16 14:16	7440-38-2	D3
Barium	**55.8**	ug/L	10.0	1.4	10	05/06/16 15:50	05/21/16 14:16	7440-39-3	
Beryllium	**1.2J**	ug/L	5.0	0.80	10	05/06/16 15:50	05/21/16 14:16	7440-41-7	
Cadmium	ND	ug/L	5.0	0.29	10	05/06/16 15:50	05/21/16 14:16	7440-43-9	D3
Chromium	**22.1**	ug/L	10.0	3.4	10	05/06/16 15:50	05/21/16 14:16	7440-47-3	
Cobalt	**12.7**	ug/L	10.0	5.0	10	05/06/16 15:50	05/21/16 14:16	7440-48-4	
Lead	**5.7J**	ug/L	10.0	1.9	10	05/06/16 15:50	05/21/16 14:16	7439-92-1	
Molybdenum	**3.0J**	ug/L	10.0	1.0	10	05/06/16 15:50	05/21/16 14:16	7439-98-7	
Selenium	ND	ug/L	10.0	1.8	10	05/06/16 15:50	05/21/16 14:16	7782-49-2	D3
Thallium	ND	ug/L	10.0	5.0	10	05/06/16 15:50	05/21/16 14:16	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:21	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**9540**	mg/L	5.0	5.0	1		05/11/16 13:23		D6
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**13.5**	mg/L	1.0	0.50	1		05/10/16 21:12	16887-00-6	
Fluoride	**0.68**	mg/L	0.20	0.073	1		05/10/16 21:12	16984-48-8	
Sulfate	**6230**	mg/L	500	124	500		05/10/16 19:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: MW-102M **Lab ID: 60218510004** Collected: 05/04/16 17:20 Received: 05/06/16 09:00 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	**1510**	ug/L	100	50.0	1	05/06/16 15:50	05/09/16 11:20	7440-42-8	
Calcium	**45.9**	mg/L	0.10	0.0081	1	05/06/16 15:50	05/09/16 11:20	7440-70-2	
Lithium	**46.7**	ug/L	10.0	4.9	1	05/06/16 15:50	05/09/16 11:20	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.38J**	ug/L	1.0	0.058	1	05/06/16 15:50	05/21/16 14:20	7440-36-0	
Arsenic	**0.64J**	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:20	7440-38-2	
Barium	**48.5**	ug/L	1.0	0.14	1	05/06/16 15:50	05/21/16 14:20	7440-39-3	
Beryllium	**0.74**	ug/L	0.50	0.080	1	05/06/16 15:50	05/21/16 14:20	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	05/06/16 15:50	05/21/16 14:20	7440-43-9	
Chromium	**20.5**	ug/L	1.0	0.34	1	05/06/16 15:50	05/21/16 14:20	7440-47-3	
Cobalt	**3.5**	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:20	7440-48-4	
Lead	**3.1**	ug/L	1.0	0.19	1	05/06/16 15:50	05/21/16 14:20	7439-92-1	
Molybdenum	**21.7**	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:20	7439-98-7	
Selenium	**0.42J**	ug/L	1.0	0.18	1	05/06/16 15:50	05/21/16 14:20	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:24	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1670**	mg/L	5.0	5.0	1		05/11/16 13:24		
9040 pH	Analytical Method: EPA 9040								
pH	**7.9**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**16.3**	mg/L	1.0	0.50	1		05/10/16 21:27	16887-00-6	
Fluoride	**4.2**	mg/L	0.20	0.073	1		05/10/16 21:27	16984-48-8	
Sulfate	**378**	mg/L	50.0	12.4	50		05/10/16 19:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: MW-122M **Lab ID: 60218510005** Collected: 05/05/16 07:10 Received: 05/06/16 09:00 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	**3140**	ug/L	100	50.0	1	05/06/16 15:50	05/09/16 11:24	7440-42-8	
Calcium	**599**	mg/L	0.10	0.0081	1	05/06/16 15:50	05/09/16 11:24	7440-70-2	
Lithium	**450**	ug/L	10.0	4.9	1	05/06/16 15:50	05/09/16 11:24	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.36J**	ug/L	5.0	0.29	5	05/06/16 15:50	05/21/16 14:42	7440-36-0	
Arsenic	ND	ug/L	5.0	0.52	5	05/06/16 15:50	05/21/16 14:42	7440-38-2	D3
Barium	**31.5**	ug/L	5.0	0.69	5	05/06/16 15:50	05/21/16 14:42	7440-39-3	
Beryllium	ND	ug/L	2.5	0.40	5	05/06/16 15:50	05/21/16 14:42	7440-41-7	D3
Cadmium	ND	ug/L	2.5	0.14	5	05/06/16 15:50	05/21/16 14:42	7440-43-9	D3
Chromium	ND	ug/L	5.0	1.7	5	05/06/16 15:50	05/21/16 14:42	7440-47-3	D3
Cobalt	**5.3**	ug/L	5.0	2.5	5	05/06/16 15:50	05/21/16 14:42	7440-48-4	
Lead	ND	ug/L	5.0	0.96	5	05/06/16 15:50	05/21/16 14:42	7439-92-1	D3
Molybdenum	**2.6J**	ug/L	5.0	0.52	5	05/06/16 15:50	05/21/16 14:42	7439-98-7	
Selenium	ND	ug/L	5.0	0.92	5	05/06/16 15:50	05/21/16 14:42	7782-49-2	D3
Thallium	ND	ug/L	5.0	2.5	5	05/06/16 15:50	05/21/16 14:42	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:26	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**11500**	mg/L	5.0	5.0	1		05/12/16 16:36		
9040 pH	Analytical Method: EPA 9040								
pH	**6.5**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**16.4**	mg/L	1.0	0.50	1		05/10/16 21:41	16887-00-6	
Fluoride	**1.1**	mg/L	0.20	0.073	1		05/10/16 21:41	16984-48-8	
Sulfate	**8260**	mg/L	1000	248	1000		05/10/16 19:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

Sample: FIELD BLANK **Lab ID: 60218510006** Collected: 05/04/16 15:00 Received: 05/06/16 09:00 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	05/06/16 15:50	05/09/16 10:54	7440-42-8	
Calcium	**0.025J**	mg/L	0.10	0.0081	1	05/06/16 15:50	05/09/16 10:54	7440-70-2	B
Lithium	ND	ug/L	10.0	4.9	1	05/06/16 15:50	05/09/16 10:54	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	05/06/16 15:50	05/21/16 14:29	7440-36-0	
Arsenic	ND	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:29	7440-38-2	
Barium	**0.14J**	ug/L	1.0	0.14	1	05/06/16 15:50	05/21/16 14:29	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.080	1	05/06/16 15:50	05/21/16 14:29	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	05/06/16 15:50	05/21/16 14:29	7440-43-9	
Chromium	ND	ug/L	1.0	0.34	1	05/06/16 15:50	05/21/16 14:29	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:29	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	05/06/16 15:50	05/21/16 14:29	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.10	1	05/06/16 15:50	05/21/16 14:29	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	05/06/16 15:50	05/21/16 14:29	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	05/06/16 15:50	05/21/16 14:29	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	05/11/16 10:55	05/11/16 15:28	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**6.0**	mg/L	5.0	5.0	1		05/11/16 13:25		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		05/12/16 15:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		05/10/16 19:44	16887-00-6	
Fluoride	ND	mg/L	0.20	0.073	1		05/10/16 19:44	16984-48-8	
Sulfate	ND	mg/L	1.0	0.25	1		05/10/16 19:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: MERP/10592 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

METHOD BLANK: 1756185 Matrix: Water
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.039	05/11/16 14:35	

LABORATORY CONTROL SAMPLE: 1756186

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: 1756187 1756188

Parameter	Units	60218420003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.039	5	5	3.4	3.2	67	65	75-125	3	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: MPRP/35806 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

METHOD BLANK: 1753357 Matrix: Water
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	50.0	05/09/16 10:09	
Calcium	mg/L	0.014J	0.10	0.0081	05/09/16 10:09	
Lithium	ug/L	ND	10.0	4.9	05/09/16 10:09	

LABORATORY CONTROL SAMPLE: 1753358

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1040	104	80-120	
Calcium	mg/L	10	10.4	104	80-120	
Lithium	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1753359 1753360

Parameter	Units	60218510002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	853	1000	1000	1920	1960	107	110	75-125	2	20	
Calcium	mg/L	72.1	10	10	81.4	83.0	94	110	75-125	2	20	
Lithium	ug/L	81.1	1000	1000	1080	1090	99	101	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: MPRP/35812 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

METHOD BLANK: 1753401 Matrix: Water
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.058	05/21/16 13:49	
Arsenic	ug/L	ND	1.0	0.10	05/21/16 13:49	
Barium	ug/L	0.29J	1.0	0.14	05/21/16 13:49	
Beryllium	ug/L	ND	0.50	0.080	05/21/16 13:49	
Cadmium	ug/L	ND	0.50	0.029	05/21/16 13:49	
Chromium	ug/L	ND	1.0	0.34	05/21/16 13:49	
Cobalt	ug/L	ND	1.0	0.50	05/21/16 13:49	
Lead	ug/L	ND	1.0	0.19	05/21/16 13:49	
Molybdenum	ug/L	ND	1.0	0.10	05/21/16 13:49	
Selenium	ug/L	ND	1.0	0.18	05/21/16 13:49	
Thallium	ug/L	ND	1.0	0.50	05/21/16 13:49	

LABORATORY CONTROL SAMPLE: 1753402

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.3	103	80-120	
Arsenic	ug/L	40	40.8	102	80-120	
Barium	ug/L	40	40.6	102	80-120	
Beryllium	ug/L	40	41.6	104	80-120	
Cadmium	ug/L	40	41.8	105	80-120	
Chromium	ug/L	40	41.8	104	80-120	
Cobalt	ug/L	40	40.7	102	80-120	
Lead	ug/L	40	40.9	102	80-120	
Molybdenum	ug/L	40	43.8	110	80-120	
Selenium	ug/L	40	40.3	101	80-120	
Thallium	ug/L	40	40.7	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1753403 1753404

Parameter	Units	60218510001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	38.6	38.4	96	96	75-125	0	20	
Arsenic	ug/L	ND	40	40	37.0	37.2	93	93	75-125	0	20	
Barium	ug/L	28.1	40	40	67.1	68.8	97	102	75-125	2	20	
Beryllium	ug/L	ND	40	40	36.8	36.0	92	90	75-125	2	20	
Cadmium	ug/L	ND	40	40	36.4	36.2	91	90	75-125	1	20	
Chromium	ug/L	ND	40	40	38.0	38.7	95	97	75-125	2	20	
Cobalt	ug/L	ND	40	40	39.5	39.2	95	94	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1753403 1753404

Parameter	Units	60218510001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	37.6	37.3	93	93	75-125	1	20	
Molybdenum	ug/L	4.6J	40	40	47.1	46.9	106	106	75-125	0	20	
Selenium	ug/L	ND	40	40	38.1	37.2	95	93	75-125	2	20	
Thallium	ug/L	ND	40	40	36.5	36.8	91	92	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: WET/61682 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510006

METHOD BLANK: 1755338 Matrix: Water
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	05/11/16 13:16	

LABORATORY CONTROL SAMPLE: 1755339

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

SAMPLE DUPLICATE: 1755340

Parameter	Units	60218627009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	772	759	2	10	H1

SAMPLE DUPLICATE: 1755341

Parameter	Units	60218510003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	9540	8340	13	10	D6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: WET/61730 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60218510005

METHOD BLANK: 1756919 Matrix: Water
Associated Lab Samples: 60218510005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	05/12/16 16:31	

LABORATORY CONTROL SAMPLE: 1756920

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1060	106	80-120	

SAMPLE DUPLICATE: 1756921

Parameter	Units	60218511009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	154	163	6	10	

SAMPLE DUPLICATE: 1756922

Parameter	Units	60218620001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	559	603	8	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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: WET/61758 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60218510001

METHOD BLANK: 1757924 Matrix: Water
Associated Lab Samples: 60218510001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	05/13/16 16:09	

LABORATORY CONTROL SAMPLE: 1757925

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1160	116	80-120	

SAMPLE DUPLICATE: 1757926

Parameter	Units	60218035001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3480	3250	7	10	H1

SAMPLE DUPLICATE: 1757927

Parameter	Units	60218651005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2230	2200	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

Pace Analytical Services, Inc.
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(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: WET/61738 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

SAMPLE DUPLICATE: 1757050

Parameter	Units	60218197001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.7	7.7	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.

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

QC Batch: WETA/39393 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

METHOD BLANK: 1755401 Matrix: Water
Associated Lab Samples: 60218510001, 60218510002, 60218510003, 60218510004, 60218510005, 60218510006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	05/10/16 13:51	
Fluoride	mg/L	ND	0.20	0.073	05/10/16 13:51	
Sulfate	mg/L	ND	1.0	0.25	05/10/16 13:51	

LABORATORY CONTROL SAMPLE: 1755402

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	80-120	
Fluoride	mg/L	2.5	2.4	96	80-120	
Sulfate	mg/L	5	5.0	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1755403 1755404

Parameter	Units	60218325001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.45J	12.5	12.5	12.6	12.6	98	98	80-120	0	15	
Sulfate	mg/L	38.1	25	25	64.0	63.2	104	101	80-120	1	15	

SAMPLE DUPLICATE: 1755405

Parameter	Units	60218325002 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	mg/L	0.45J	0.43J		15	
Sulfate	mg/L	37.5	36.8	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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QUALIFIERS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218510

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

1e	Reran at a lower volume to meet residue criteria
2e	Residue exceeded the method limit of 0.2 g
B	Analyte was detected in the associated method blank.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H1	Analysis conducted outside the EPA method holding time.
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 Midland LF/25215173
Pace Project No.: 60218510

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60218510001	**MW-301**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510002	**MW-302**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510003	**MW-303**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510004	**MW-102M**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510005	**MW-122M**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510006	**FIELD BLANK**	EPA 3010	MPRP/35806	EPA 6010	ICP/26162
60218510001	**MW-301**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510002	**MW-302**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510003	**MW-303**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510004	**MW-102M**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510005	**MW-122M**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510006	**FIELD BLANK**	EPA 3010	MPRP/35812	EPA 6020	ICPM/4247
60218510001	**MW-301**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510002	**MW-302**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510003	**MW-303**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510004	**MW-102M**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510005	**MW-122M**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510006	**FIELD BLANK**	EPA 7470	MERP/10592	EPA 7470	MERC/10539
60218510001	**MW-301**	SM 2540C	WET/61682		
60218510001	**MW-301**	SM 2540C	WET/61758		
60218510002	**MW-302**	SM 2540C	WET/61682		
60218510003	**MW-303**	SM 2540C	WET/61682		
60218510004	**MW-102M**	SM 2540C	WET/61682		
60218510005	**MW-122M**	SM 2540C	WET/61730		
60218510006	**FIELD BLANK**	SM 2540C	WET/61682		
60218510001	**MW-301**	EPA 9040	WET/61738		
60218510002	**MW-302**	EPA 9040	WET/61738		
60218510003	**MW-303**	EPA 9040	WET/61738		
60218510004	**MW-102M**	EPA 9040	WET/61738		
60218510005	**MW-122M**	EPA 9040	WET/61738		
60218510006	**FIELD BLANK**	EPA 9040	WET/61738		
60218510001	**MW-301**	EPA 9056	WETA/39393		
60218510002	**MW-302**	EPA 9056	WETA/39393		
60218510003	**MW-303**	EPA 9056	WETA/39393		
60218510004	**MW-102M**	EPA 9056	WETA/39393		
60218510005	**MW-122M**	EPA 9056	WETA/39393		
60218510006	**FIELD BLANK**	EPA 9056	WETA/39393		

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Sample Condition Upon Receipt

WO# : 60218510

60218510

Client Name: SCS Engineers - Apex 5-6-16

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7830 0967 3677 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 +1.0 T-239 / CF 0.0 (T-262) **Type of Ice:** (Wet) Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 4.7

Date and initials of person examining contents: JD 5/6

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1.	
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.	
Sampler name & signature on COC:	☐Yes ☒No ☐N/A	4.	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	6. pH	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.	
Sufficient volume:	☒Yes ☐No ☐N/A	8.	
Correct containers used:	☒Yes ☐No ☐N/A		
Pace containers used:	☒Yes ☐No ☐N/A	9.	
Containers intact:	☒Yes ☐No ☐N/A	10.	
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.	
Sample labels match COC: Includes date/time/ID/analyses Matrix: WT	☒Yes ☐No ☐N/A	13.	
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A		
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.	
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed	Lot # of added preservative
Trip Blank present: Pace Trip Blank lot # (if purchased):	☐Yes ☐No ☒N/A	15.	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.	
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:	
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 5-6-16

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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	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25215173	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: IA

Requested Analysis Filtered (Y/N)

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	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N					60218510
1	MW-301	WT	G	xxx	xxx	5/4/16	10:20	13.4	2	1		1						Analysis Test	X	X	X	X	X	X		TRIP BLANK 001
2	MW-302	WT	G	xxx	xxx		12:15	13.6	2	1		1							X	X	X	X	X	X		002
3	MW-303	WT	G	xxx	xxx		14:15	14.5	2	1		1							X	X	X	X	X	X		003
4	MW-102M	WT	G	xxx	xxx	5/4/16	17:20	14.0	2	1		1							X	X	X	X	X	X		004
5	MW-122M	WT	G	xxx	xxx	5/5/16	9:10	16.1	2	1		1							X	X	X	X	X	X		005
6	FIELD BLANK	WT	G	xxx	xxx	5/4/16	15:00	—	2	1		1							X	X	X	X	X	X		006
7																										
8																										
9																										
10																										
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. Grown	5/5/16	15:30	J-2	5/6	0900	4.7	Y	Y	Y
* Sb-As-Ba-Be-Cd-Co-Cr-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
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.

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 25, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on May 06, 2016. 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.

Amended Report, Revision 1 on 1/25/18, Total Radium Concentration

Revision 1 - This report replaces the June 3, 2016 report. This report has been reissued on January 25, 2018. In 2017, the process for calculating Total Radium concentration using results from individual Ra-226 and Ra-228 analyses was standardized. At the client's request, this project from 2016 has been revised to include a Total Radium concentration using the standardized method.

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

Sincerely,

Trudy Gipson

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

Enclosures

cc: Tom Karwaski, SCS Engineers Kyle Kramer, SCS Engineers

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

cc: Jeff Maxted, Alliant Energy

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60218521001	**MW-301**	Water	05/04/16 10:20	05/06/16 09:00
60218521002	**MW-302**	Water	05/04/16 12:15	05/06/16 09:00
60218521003	**MW-303**	Water	05/04/16 14:15	05/06/16 09:00
60218521004	**MW-102M**	Water	05/04/16 17:20	05/06/16 09:00
60218521005	**MW-122M**	Water	05/05/16 07:10	05/06/16 09:00
60218521006	**FIELD BLANK**	Water	05/04/16 15:00	05/06/16 09:00

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60218521001	**MW-301**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60218521002	**MW-302**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60218521003	**MW-303**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60218521004	**MW-102M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60218521005	**MW-122M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60218521006	**FIELD BLANK**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: MW-301 **Lab ID: 60218521001** Collected: 05/04/16 10:20 Received: 05/06/16 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	**0.565 ± 0.356 (0.153) C:NA T:91%**	pCi/L	06/02/16 10:42	13982-63-3	
Radium-228	EPA 904.0	**1.42 ± 0.559 (0.859) C:76% T:72%**	pCi/L	05/27/16 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**1.99 ± 0.915 (1.01)**	pCi/L	06/02/16 13:18	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: MW-302 **Lab ID: 60218521002** Collected: 05/04/16 12:15 Received: 05/06/16 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	**0.412 ± 0.478 (0.771) C:NA T:88%**	pCi/L	06/02/16 11:14	13982-63-3	
Radium-228	EPA 904.0	**0.462 ± 0.403 (0.818) C:84% T:78%**	pCi/L	05/27/16 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**0.874 ± 0.881 (1.59)**	pCi/L	06/02/16 13:18	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: MW-303 **Lab ID: 60218521003** Collected: 05/04/16 14:15 Received: 05/06/16 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	**2.51 ± 0.877 (0.598) C:NA T:84%**	pCi/L	06/02/16 10:44	13982-63-3	
Radium-228	EPA 904.0	**8.08 ± 1.68 (0.814) C:80% T:71%**	pCi/L	05/27/16 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**10.6 ± 2.56 (1.41)**	pCi/L	06/02/16 13:18	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: MW-102M **Lab ID: 60218521004** Collected: 05/04/16 17:20 Received: 05/06/16 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	**-0.058 ± 0.343 (0.765) C:NA T:90%**	pCi/L	06/02/16 10:46	13982-63-3	
Radium-228	EPA 904.0	**2.64 ± 1.25 (2.13) C:69% T:33%**	pCi/L	05/27/16 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**2.64 ± 1.59 (2.90)**	pCi/L	06/03/16 11:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: MW-122M **Lab ID: 60218521005** Collected: 05/05/16 07:10 Received: 05/06/16 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	**0.157 ± 0.240 (0.386) C:NA T:96%**	pCi/L	06/02/16 11:00	13982-63-3	
Radium-228	EPA 904.0	**1.96 ± 0.642 (0.894) C:79% T:75%**	pCi/L	05/27/16 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**2.12 ± 0.882 (1.28)**	pCi/L	06/02/16 13:18	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Sample: FIELD BLANK **Lab ID: 60218521006** Collected: 05/04/16 15:00 Received: 05/06/16 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	**-0.057 ± 0.371 (0.806) C:NA T:91%**	pCi/L	06/02/16 10:59	13982-63-3	
Radium-228	EPA 904.0	**0.0382 ± 0.428 (0.981) C:78% T:69%**	pCi/L	06/02/16 11:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.0382 ± 0.799 (1.79)**	pCi/L	06/03/16 11:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

QC Batch: 220236 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60218521001, 60218521002, 60218521003, 60218521004, 60218521005, 60218521006

METHOD BLANK: 1077503 Matrix: Water
Associated Lab Samples: 60218521001, 60218521002, 60218521003, 60218521004, 60218521005, 60218521006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.059 ± 0.268 (0.545) C:NA T:91%	pCi/L	06/02/16 10:10	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

QC Batch: 220241 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60218521001, 60218521002, 60218521003, 60218521004, 60218521005, 60218521006

METHOD BLANK: 1077508 Matrix: Water
Associated Lab Samples: 60218521001, 60218521002, 60218521003, 60218521004, 60218521005, 60218521006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.123 ± 0.369 (0.878) C:77% T:80%	pCi/L	05/27/16 11:57	

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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(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25215173
Pace Project No.: 60218521

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60218521001	**MW-301**	EPA 903.1	220236		
60218521002	**MW-302**	EPA 903.1	220236		
60218521003	**MW-303**	EPA 903.1	220236		
60218521004	**MW-102M**	EPA 903.1	220236		
60218521005	**MW-122M**	EPA 903.1	220236		
60218521006	**FIELD BLANK**	EPA 903.1	220236		
60218521001	**MW-301**	EPA 904.0	220241		
60218521002	**MW-302**	EPA 904.0	220241		
60218521003	**MW-303**	EPA 904.0	220241		
60218521004	**MW-102M**	EPA 904.0	220241		
60218521005	**MW-122M**	EPA 904.0	220241		
60218521006	**FIELD BLANK**	EPA 904.0	220241		
60218521001	**MW-301**	Total Radium Calculation	221929		
60218521002	**MW-302**	Total Radium Calculation	221929		
60218521003	**MW-303**	Total Radium Calculation	221929		
60218521004	**MW-102M**	Total Radium Calculation	285986		
60218521005	**MW-122M**	Total Radium Calculation	221929		
60218521006	**FIELD BLANK**	Total Radium Calculation	285975		

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Sample Condition Upon Receipt

WO# : 60218521

60218521

Client Name: SCS Engineers

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7830 0063 3677 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 +1.0 T-239 / CF 0.0 T-262 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 1.0

Temperature should be above freezing to 6°C

Date and initials of person examining contents: JB 5/6

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☐Yes ☒No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: WT		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Trip Blank present:	☐Yes ☐No ☒N/A	
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AM Date: 5-6-16

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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:
Requested Due Date/TAT:	

Section B — **Required** Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25215173

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB TIME	COLLECTED: COMPOSITE END/GRAB DATE	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	10:20	5/4/16		2			2							X	X	X		(2) BPW 20 001
2	MW-302	WT	G	xxx	xxx	12:15	"		2			2							X	X	X		002
3	MW-303	WT	G	xxx	xxx	14:15	"		2			2							X	X	X		003
4	MW-102M	WT	G	xxx	xxx	17:20	"		2			2							X	X	X		004
5	MW-122M	WT	G	xxx	xxx	7:10	5/5/16		2			2							X	X	X		005
6	FIELD BLANK	WT	G	xxx	xxx	15:00	5/4/16		2			2							X	X	X		006
7																							
8																							
9																							
10																							
11																							
12	FIELD BLANK																						

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.: 60 212521

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Lyon SCS	5/5/16	15:30	J. S	5/6	0900	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
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

Pace Analytical®
www.pacelabs.com

Workorder: 60218521 **Workorder Name:** Ottumwa Midland LF/25215173 **Owner Received Date:** 5/6/2016 **Results Requested By:** 5/31/2016

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

WO#:30182852

30182852

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3						Requested Analysis 903.1 Radium-226	904.0 Radium-228	Total Radium										LAB USE ONLY
1	MW-301	PS	5/4/2016 10:20	60218521001	Water	2						X	X	X										001
2	MW-302	PS	5/4/2016 12:15	60218521002	Water	2						X	X	X										002
3	MW-303	PS	5/4/2016 14:15	60218521003	Water	2						X	X	X										003
4	MW-102M	PS	5/4/2016 17:20	60218521004	Water	2						X	X	X										004
5	MW-122M	PS	5/5/2016 07:10	60218521005	Water	2						X	X	X										005
6	FIELD BLANK	PS	5/4/2016 15:00	60218521006	Water	2						X	X	X										006

Transfers	Released By	Date/Time	Received	Date/Time
1		5/4/16 1700		5/11/16 0930
2				
3				

Comments

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

Pace Analytical

30182852

Client Name: PACE, KS Project #

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other Term

Tracking #: 7050

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

Thermometer Used 8 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 18.3 °C Correction Factor: +0.1 °C Final Temp: 18.4 °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KH 5/11/16

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: -Includes date/time/ID/Analysis Matrix: WT	✓			5.
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: -Pace Containers Used:	✓ ✓			10. ~~All samples pH < 2~~ KH 5/11/16
Containers Intact:	✓			11.
Filtered volume received for Dissolved tests		✓		12.
All containers needing preservation have been checked. All containers needing preservation are found to be in compliance with EPA recommendation.	✓ ✓			13. All sample's pH < 2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed KH; Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	14.
Trip Blank Present:			✓	15.
Trip Blank Custody Seals Present			✓	

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

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)

A2 Round 2 Background Sampling, Analytical Laboratory Report

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 05, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on June 25, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60222190001	**MW-301**	Water	06/22/16 12:30	06/25/16 08:50
60222190002	**MW-302**	Water	06/22/16 11:30	06/25/16 08:50
60222190003	**MW-303**	Water	06/22/16 10:15	06/25/16 08:50
60222190004	**MW-102M**	Water	06/22/16 14:15	06/25/16 08:50
60222190005	**MW-122M**	Water	06/23/16 08:00	06/25/16 08:50
60222190006	**FIELD BLANK**	Water	06/22/16 12:10	06/25/16 08:50

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60222190001	**MW-301**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K
60222190002	**MW-302**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K
60222190003	**MW-303**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K
60222190004	**MW-102M**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K
60222190005	**MW-122M**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K
60222190006	**FIELD BLANK**	EPA 6010	NDJ	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	HAC	1	PASI-K
		EPA 9040	LDB	1	PASI-K
		EPA 9056	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: MW-301 **Lab ID: 60222190001** Collected: 06/22/16 12:30 Received: 06/25/16 08:50 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	**1860**	ug/L	100	50.0	1	06/27/16 16:30	06/28/16 15:53	7440-42-8	
Calcium	**472**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 15:53	7440-70-2	M1
Lithium	**268**	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 15:53	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	2.0	0.12	2	06/27/16 16:30	06/30/16 11:00	7440-36-0	D3
Arsenic	**0.84J**	ug/L	2.0	0.21	2	06/27/16 16:30	06/30/16 11:00	7440-38-2	
Barium	**26.6**	ug/L	5.0	0.69	5	06/27/16 16:30	06/28/16 14:21	7440-39-3	
Beryllium	ND	ug/L	1.5	0.24	3	06/27/16 16:30	06/30/16 13:44	7440-41-7	
Cadmium	ND	ug/L	1.0	0.058	2	06/27/16 16:30	06/30/16 11:00	7440-43-9	D3
Chromium	ND	ug/L	2.0	0.68	2	06/27/16 16:30	06/30/16 11:00	7440-47-3	D3
Cobalt	ND	ug/L	2.0	1.0	2	06/27/16 16:30	06/30/16 11:00	7440-48-4	D3
Lead	ND	ug/L	5.0	0.96	5	06/27/16 16:30	06/28/16 14:21	7439-92-1	D3
Molybdenum	**2.0J**	ug/L	2.0	0.21	2	06/27/16 16:30	06/30/16 11:00	7439-98-7	B
Selenium	ND	ug/L	2.0	0.37	2	06/27/16 16:30	06/30/16 11:00	7782-49-2	D3
Thallium	ND	ug/L	5.0	2.5	5	06/27/16 16:30	06/28/16 14:21	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:00	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**5380**	mg/L	5.0	5.0	1		06/28/16 10:28		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**112**	mg/L	10.0	5.0	10		07/03/16 15:17	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.073	1		07/02/16 19:19	16984-48-8	
Sulfate	**5370**	mg/L	500	124	500		07/03/16 15:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: MW-302 **Lab ID: 60222190002** Collected: 06/22/16 11:30 Received: 06/25/16 08:50 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	**796**	ug/L	100	50.0	1	06/27/16 16:30	06/28/16 16:13	7440-42-8	
Calcium	**56.6**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 16:13	7440-70-2	
Lithium	**81.2**	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 16:13	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.15J**	ug/L	1.0	0.058	1	06/27/16 16:30	06/28/16 14:25	7440-36-0	B
Arsenic	**0.39J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:25	7440-38-2	
Barium	**45.4**	ug/L	1.0	0.14	1	06/27/16 16:30	06/28/16 14:25	7440-39-3	
Beryllium	**0.16J**	ug/L	0.50	0.080	1	06/27/16 16:30	06/30/16 13:12	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	06/27/16 16:30	06/28/16 14:25	7440-43-9	
Chromium	**6.2**	ug/L	1.0	0.34	1	06/27/16 16:30	06/28/16 14:25	7440-47-3	
Cobalt	**1.1**	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:25	7440-48-4	
Lead	**0.90J**	ug/L	1.0	0.19	1	06/27/16 16:30	06/28/16 14:25	7439-92-1	
Molybdenum	**0.49J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:25	7439-98-7	B
Selenium	**0.39J**	ug/L	1.0	0.18	1	06/27/16 16:30	06/28/16 14:25	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:25	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:02	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**715**	mg/L	5.0	5.0	1		06/28/16 10:28		
9040 pH	Analytical Method: EPA 9040								
pH	**7.1**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.1**	mg/L	1.0	0.50	1		07/02/16 19:48	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.073	1		07/02/16 19:48	16984-48-8	
Sulfate	**133**	mg/L	10.0	2.5	10		07/03/16 16:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: MW-303 **Lab ID: 60222190003** Collected: 06/22/16 10:15 Received: 06/25/16 08:50 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	**2430**	ug/L	100	50.0	1	06/27/16 16:30	06/28/16 16:15	7440-42-8	
Calcium	**462**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 16:15	7440-70-2	
Lithium	**270**	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 16:15	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	06/27/16 16:30	06/30/16 11:09	7440-36-0	
Arsenic	**0.30J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/30/16 11:09	7440-38-2	
Barium	**47.6**	ug/L	5.0	0.69	5	06/27/16 16:30	06/28/16 14:38	7440-39-3	
Beryllium	ND	ug/L	1.5	0.24	3	06/27/16 16:30	06/30/16 13:46	7440-41-7	D3
Cadmium	ND	ug/L	0.50	0.029	1	06/27/16 16:30	06/30/16 11:09	7440-43-9	
Chromium	**3.1**	ug/L	1.0	0.34	1	06/27/16 16:30	06/30/16 11:09	7440-47-3	
Cobalt	**1.6**	ug/L	1.0	0.50	1	06/27/16 16:30	06/30/16 11:09	7440-48-4	
Lead	**1.6J**	ug/L	5.0	0.96	5	06/27/16 16:30	06/28/16 14:38	7439-92-1	
Molybdenum	**0.38J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/30/16 11:09	7439-98-7	B
Selenium	**0.38J**	ug/L	1.0	0.18	1	06/27/16 16:30	06/30/16 11:09	7782-49-2	
Thallium	ND	ug/L	5.0	2.5	5	06/27/16 16:30	06/28/16 14:38	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**7120**	mg/L	5.0	5.0	1		06/28/16 10:30		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**11.5**	mg/L	1.0	0.50	1		07/02/16 20:03	16887-00-6	
Fluoride	**0.47**	mg/L	0.20	0.073	1		07/02/16 20:03	16984-48-8	
Sulfate	**4690**	mg/L	500	124	500		07/03/16 16:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: MW-102M **Lab ID: 60222190004** Collected: 06/22/16 14:15 Received: 06/25/16 08:50 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	**1440**	ug/L	100	50.0	1	06/27/16 16:30	06/28/16 16:18	7440-42-8	
Calcium	**147**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 16:18	7440-70-2	
Lithium	**80.7**	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 16:18	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.19J**	ug/L	1.0	0.058	1	06/27/16 16:30	06/28/16 14:43	7440-36-0	B
Arsenic	**0.68J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:43	7440-38-2	
Barium	**39.5**	ug/L	1.0	0.14	1	06/27/16 16:30	06/28/16 14:43	7440-39-3	
Beryllium	**1.4**	ug/L	1.0	0.16	2	06/27/16 16:30	06/30/16 13:47	7440-41-7	
Cadmium	**0.12J**	ug/L	0.50	0.029	1	06/27/16 16:30	06/28/16 14:43	7440-43-9	
Chromium	**17.9**	ug/L	1.0	0.34	1	06/27/16 16:30	06/28/16 14:43	7440-47-3	
Cobalt	**4.5**	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:43	7440-48-4	
Lead	**3.6**	ug/L	1.0	0.19	1	06/27/16 16:30	06/28/16 14:43	7439-92-1	
Molybdenum	**10.3**	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:43	7439-98-7	
Selenium	**1.0**	ug/L	1.0	0.18	1	06/27/16 16:30	06/28/16 14:43	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:43	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:07	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1530**	mg/L	5.0	5.0	1		06/28/16 10:30		
9040 pH	Analytical Method: EPA 9040								
pH	**7.9**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**13.8**	mg/L	1.0	0.50	1		07/02/16 20:18	16887-00-6	
Fluoride	**4.2**	mg/L	0.20	0.073	1		07/02/16 20:18	16984-48-8	
Sulfate	**350**	mg/L	50.0	12.4	50		07/03/16 16:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: MW-122M **Lab ID: 60222190005** Collected: 06/23/16 08:00 Received: 06/25/16 08:50 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	**1720**	ug/L	100	50.0	1	06/27/16 16:30	06/28/16 16:20	7440-42-8	
Calcium	**312**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 16:20	7440-70-2	
Lithium	**332**	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 16:20	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**1.0J**	ug/L	5.0	0.29	5	06/27/16 16:30	06/28/16 14:47	7440-36-0	B
Arsenic	ND	ug/L	5.0	0.52	5	06/27/16 16:30	06/28/16 14:47	7440-38-2	D3
Barium	**17.9**	ug/L	5.0	0.69	5	06/27/16 16:30	06/28/16 14:47	7440-39-3	
Beryllium	ND	ug/L	1.5	0.24	3	06/27/16 16:30	06/30/16 13:49	7440-41-7	D3
Cadmium	ND	ug/L	2.5	0.14	5	06/27/16 16:30	06/28/16 14:47	7440-43-9	D3
Chromium	ND	ug/L	5.0	1.7	5	06/27/16 16:30	06/28/16 14:47	7440-47-3	D3
Cobalt	**6.5**	ug/L	5.0	2.5	5	06/27/16 16:30	06/28/16 14:47	7440-48-4	
Lead	ND	ug/L	5.0	0.96	5	06/27/16 16:30	06/28/16 14:47	7439-92-1	D3
Molybdenum	**2.6J**	ug/L	5.0	0.52	5	06/27/16 16:30	06/28/16 14:47	7439-98-7	B
Selenium	ND	ug/L	5.0	0.92	5	06/27/16 16:30	06/28/16 14:47	7782-49-2	D3
Thallium	ND	ug/L	5.0	2.5	5	06/27/16 16:30	06/28/16 14:47	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:09	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**7430**	mg/L	5.0	5.0	1		06/28/16 10:39		
9040 pH	Analytical Method: EPA 9040								
pH	**6.7**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**21.9**	mg/L	2.0	1.0	2		07/03/16 17:29	16887-00-6	
Fluoride	**0.89**	mg/L	0.20	0.073	1		07/02/16 20:33	16984-48-8	
Sulfate	**5330**	mg/L	500	124	500		07/03/16 17:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Sample: FIELD BLANK **Lab ID: 60222190006** Collected: 06/22/16 12:10 Received: 06/25/16 08:50 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	06/27/16 16:30	06/28/16 16:23	7440-42-8	
Calcium	**0.035J**	mg/L	0.10	0.0081	1	06/27/16 16:30	06/28/16 16:23	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	06/27/16 16:30	06/28/16 16:23	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.083J**	ug/L	1.0	0.058	1	06/27/16 16:30	06/28/16 14:51	7440-36-0	B
Arsenic	ND	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:51	7440-38-2	
Barium	**0.16J**	ug/L	1.0	0.14	1	06/27/16 16:30	06/28/16 14:51	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.080	1	06/27/16 16:30	06/30/16 13:18	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	06/27/16 16:30	06/28/16 14:51	7440-43-9	
Chromium	**0.45J**	ug/L	1.0	0.34	1	06/27/16 16:30	06/28/16 14:51	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:51	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	06/27/16 16:30	06/28/16 14:51	7439-92-1	
Molybdenum	**0.15J**	ug/L	1.0	0.10	1	06/27/16 16:30	06/28/16 14:51	7439-98-7	B
Selenium	ND	ug/L	1.0	0.18	1	06/27/16 16:30	06/28/16 14:51	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	06/27/16 16:30	06/28/16 14:51	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	06/28/16 16:45	06/29/16 12:11	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**16.0**	mg/L	5.0	5.0	1		06/28/16 10:31		
9040 pH	Analytical Method: EPA 9040								
pH	**6.1**	Std. Units	0.10	0.10	1		06/27/16 09:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		07/03/16 14:33	16887-00-6	
Fluoride	ND	mg/L	0.20	0.073	1		07/03/16 14:33	16984-48-8	
Sulfate	ND	mg/L	1.0	0.25	1		07/03/16 14:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: MERP/10767 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

METHOD BLANK: 1784604 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.039	06/29/16 11:33	

LABORATORY CONTROL SAMPLE: 1784605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784606 1784607

Parameter	Units	60222250001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.81	5	5	5.0	4.9	84	81	75-125	3	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 Midland LF/25216073
Pace Project No.: 60222190

QC Batch: MPRP/36477 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

METHOD BLANK: 1783844 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	50.0	06/28/16 15:50	
Calcium	mg/L	ND	0.10	0.0081	06/28/16 15:50	
Lithium	ug/L	ND	10.0	4.9	06/28/16 15:50	

LABORATORY CONTROL SAMPLE: 1783845

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	964	96	80-120	
Calcium	mg/L	10	9.4	94	80-120	
Lithium	ug/L	1000	986	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1783846 1783847

Parameter	Units	60222190001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1860	1000	1000	2910	2870	106	102	75-125	1	20	
Calcium	mg/L	472	10	10	494	489	216	171	75-125	1	20	M1
Lithium	ug/L	268	1000	1000	1370	1370	110	110	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: MPRP/36478 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

METHOD BLANK: 1783848 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.094J	1.0	0.058	06/28/16 14:12	
Arsenic	ug/L	ND	1.0	0.10	06/28/16 14:12	
Barium	ug/L	0.15J	1.0	0.14	06/28/16 14:12	
Beryllium	ug/L	ND	0.50	0.080	06/30/16 13:03	
Cadmium	ug/L	ND	0.50	0.029	06/28/16 14:12	
Chromium	ug/L	ND	1.0	0.34	06/28/16 14:12	
Cobalt	ug/L	ND	1.0	0.50	06/28/16 14:12	
Lead	ug/L	ND	1.0	0.19	06/28/16 14:12	
Molybdenum	ug/L	0.17J	1.0	0.10	06/28/16 14:12	
Selenium	ug/L	ND	1.0	0.18	06/28/16 14:12	
Thallium	ug/L	ND	1.0	0.50	06/28/16 14:12	

LABORATORY CONTROL SAMPLE: 1783849

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	42.4	106	80-120	
Arsenic	ug/L	40	43.5	109	80-120	
Barium	ug/L	40	40.8	102	80-120	
Beryllium	ug/L	40	43.8	109	80-120	
Cadmium	ug/L	40	42.7	107	80-120	
Chromium	ug/L	40	42.6	106	80-120	
Cobalt	ug/L	40	41.9	105	80-120	
Lead	ug/L	40	40.2	100	80-120	
Molybdenum	ug/L	40	42.5	106	80-120	
Selenium	ug/L	40	43.3	108	80-120	
Thallium	ug/L	40	39.3	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1783850 1783851

Parameter	Units	60222190002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.15J	40	40	40.7	41.4	101	103	75-125	2	20	
Arsenic	ug/L	0.39J	40	40	41.5	42.5	103	105	75-125	2	20	
Barium	ug/L	45.4	40	40	86.7	87.8	103	106	75-125	1	20	
Beryllium	ug/L	0.16J	40	40	33.9	34.1	84	85	75-125	0	20	
Cadmium	ug/L	ND	40	40	40.7	41.3	102	103	75-125	1	20	
Chromium	ug/L	6.2	40	40	48.0	48.8	105	106	75-125	2	20	
Cobalt	ug/L	1.1	40	40	41.1	41.7	100	102	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1783850 1783851

Parameter	Units	60222190002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.90J	40	40	43.9	44.3	107	109	75-125	1	20	
Molybdenum	ug/L	0.49J	40	40	40.5	42.2	100	104	75-125	4	20	
Selenium	ug/L	0.39J	40	40	37.8	38.8	94	96	75-125	3	20	
Thallium	ug/L	ND	40	40	41.6	42.7	104	107	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: WET/62657 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60222190001, 60222190002

METHOD BLANK: 1784036 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	06/28/16 10:17	

LABORATORY CONTROL SAMPLE: 1784037

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	994	99	80-120	

SAMPLE DUPLICATE: 1784038

Parameter	Units	60222217003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2990	3020	1	10	

SAMPLE DUPLICATE: 1784039

Parameter	Units	60222138001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1570	1580	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: WET/62658 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60222190003, 60222190004, 60222190005, 60222190006

METHOD BLANK: 1784043 Matrix: Water
Associated Lab Samples: 60222190003, 60222190004, 60222190005, 60222190006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	06/28/16 10:29	

LABORATORY CONTROL SAMPLE: 1784044

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	962	96	80-120	

SAMPLE DUPLICATE: 1784045

Parameter	Units	60222267002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2130	2120	0	10	

SAMPLE DUPLICATE: 1784046

Parameter	Units	60222021001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1450	1440	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: WET/62631 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

SAMPLE DUPLICATE: 1783487

Parameter	Units	60222190003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.2	6.1	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: WETA/40379 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005

METHOD BLANK: 1787659 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	07/02/16 17:34	
Fluoride	mg/L	ND	0.20	0.073	07/02/16 17:34	

LABORATORY CONTROL SAMPLE: 1787660

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	2.4	95	80-120	

SAMPLE DUPLICATE: 1787663

Parameter	Units	60222190001 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoride	mg/L	0.38	0.40	6	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

QC Batch: WETA/40383 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

METHOD BLANK: 1787896 Matrix: Water
Associated Lab Samples: 60222190001, 60222190002, 60222190003, 60222190004, 60222190005, 60222190006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	07/03/16 12:50	
Fluoride	mg/L	ND	0.20	0.073	07/03/16 12:50	
Sulfate	mg/L	ND	1.0	0.25	07/03/16 12:50	

LABORATORY CONTROL SAMPLE: 1787897

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1787898 1787899

Parameter	Units	60222164001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	41.1	25	25	66.9	66.7	103	103	80-120	0	15	
Fluoride	mg/L	ND	12.5	12.5	12.8	12.8	98	98	80-120	0	15	
Sulfate	mg/L	61.6	25	25	89.5	89.1	111	110	80-120	0	15	

SAMPLE DUPLICATE: 1787922

Parameter	Units	60222190001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	112	112	0	15	
Fluoride	mg/L	0.38	0.95J			
Sulfate	mg/L	5370	4750	12	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
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.

Pace Analytical Services, Inc.
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222190

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60222190001	**MW-301**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190002	**MW-302**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190003	**MW-303**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190004	**MW-102M**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190005	**MW-122M**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190006	**FIELD BLANK**	EPA 3010	MPRP/36477	EPA 6010	ICP/26588
60222190001	**MW-301**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190002	**MW-302**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190003	**MW-303**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190004	**MW-102M**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190005	**MW-122M**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190006	**FIELD BLANK**	EPA 3010	MPRP/36478	EPA 6020	ICPM/4340
60222190001	**MW-301**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190002	**MW-302**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190003	**MW-303**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190004	**MW-102M**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190005	**MW-122M**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190006	**FIELD BLANK**	EPA 7470	MERP/10767	EPA 7470	MERC/10707
60222190001	**MW-301**	SM 2540C	WET/62657		
60222190002	**MW-302**	SM 2540C	WET/62657		
60222190003	**MW-303**	SM 2540C	WET/62658		
60222190004	**MW-102M**	SM 2540C	WET/62658		
60222190005	**MW-122M**	SM 2540C	WET/62658		
60222190006	**FIELD BLANK**	SM 2540C	WET/62658		
60222190001	**MW-301**	EPA 9040	WET/62631		
60222190002	**MW-302**	EPA 9040	WET/62631		
60222190003	**MW-303**	EPA 9040	WET/62631		
60222190004	**MW-102M**	EPA 9040	WET/62631		
60222190005	**MW-122M**	EPA 9040	WET/62631		
60222190006	**FIELD BLANK**	EPA 9040	WET/62631		
60222190001	**MW-301**	EPA 9056	WETA/40379		
60222190001	**MW-301**	EPA 9056	WETA/40383		
60222190002	**MW-302**	EPA 9056	WETA/40379		
60222190002	**MW-302**	EPA 9056	WETA/40383		
60222190003	**MW-303**	EPA 9056	WETA/40379		
60222190003	**MW-303**	EPA 9056	WETA/40383		
60222190004	**MW-102M**	EPA 9056	WETA/40379		
60222190004	**MW-102M**	EPA 9056	WETA/40383		
60222190005	**MW-122M**	EPA 9056	WETA/40379		
60222190005	**MW-122M**	EPA 9056	WETA/40383		
60222190006	**FIELD BLANK**	EPA 9056	WETA/40383		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60222190

60222190

Client Name: SCS

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7834 4170 1930 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 -0.1 T-239 / CF 0.0 T-262 **Type of Ice:** (Wet) Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 0.8

Date and initials of person examining contents: JB 6/25

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☐Yes ☒No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	6. pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: WT		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Trip Blank present:	☐Yes ☐No ☒N/A	
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: JMS Date: 6.27.16

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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:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60222190
																		N	N	N						
1	MW-301	WT	G	xxx	xxx	6/22/16	12:30	MS	2	1		1						X	X	X	X	X	X			BP2N BP2N2.0 a1
2	MW-302	WT	G	xxx	xxx		11:30	MS	2	1		1						X	X	X	X	X	X			a2
3	MW-303	WT	G	xxx	xxx		10:15	MS	2	1		1						X	X	X	X	X	X			a3
4	MW-102M	WT	G	xxx	xxx		17:15	MS	2	1		1						X	X	X	X	X	X			a4
5	MW-122M	WT	G	xxx	xxx	6/23/16	8:00	MS	2	1		1						X	X	X	X	X	X			a5
6	FIELD BLANK	WT	G	xxx	xxx	6/22/16	12:10	—	2	1		1						X	X	X	X	X	X			a6
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219					6/25	0850	0.8	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Paul A. Grover

SIGNATURE of SAMPLER: Paul A. Grover DATE Signed (MM/DD/YY): 6/24/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 25, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on June 25, 2016. 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.

Revision 1 - This report replaces the July 20, 2016 report. This report has been reissued on January 25, 2018. In 2017, the process for calculating Total Radium concentration using results from individual Ra-226 and Ra-228 analyses was standardized. At the client's request, this project from 2016 has been revised to include a Total Radium concentration using the standardized method. The Radium Sum Calculation was added to sample 006 as per client request.

Amended Report, Revision 1 on 1/25/18, Total Radium Concentration

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

Sincerely,

Trudy Gipson

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

Enclosures

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60222211001	**MW-301**	Water	06/22/16 12:30	06/25/16 08:50
60222211002	**MW-302**	Water	06/22/16 11:30	06/25/16 08:50
60222211003	**MW-303**	Water	06/22/16 10:15	06/25/16 08:50
60222211004	**MW-102M**	Water	06/23/16 07:15	06/25/16 08:50
60222211005	**MW-122M**	Water	06/23/16 08:00	06/25/16 08:50
60222211006	**FIELD BLANK**	Water	06/22/16 12:10	06/25/16 08:50

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60222211001	**MW-301**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60222211002	**MW-302**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60222211003	**MW-303**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60222211004	**MW-102M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60222211005	**MW-122M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60222211006	**FIELD BLANK**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: MW-301 **Lab ID: 60222211001** Collected: 06/22/16 12:30 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0710 ± 0.368 (0.764) C:NA T:84%**	pCi/L	07/18/16 12:06	13982-63-3	
Radium-228	EPA 904.0	**0.214 ± 0.320 (0.689) C:78% T:79%**	pCi/L	07/18/16 15:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.285 ± 0.688 (1.45)**	pCi/L	07/20/16 12:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: MW-302 **Lab ID: 60222211002** Collected: 06/22/16 11:30 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.066 ± 0.431 (0.934) C:NA T:92%**	pCi/L	07/18/16 12:06	13982-63-3	
Radium-228	EPA 904.0	**0.677 ± 0.409 (0.744) C:78% T:70%**	pCi/L	07/18/16 15:44	15262-20-1	
Total Radium	Total Radium Calculation	**0.677 ± 0.840 (1.68)**	pCi/L	07/20/16 11:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: MW-303 **Lab ID: 60222211003** Collected: 06/22/16 10:15 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**2.96 ± 0.957 (0.495) C:NA T:89%**	pCi/L	07/18/16 12:17	13982-63-3	
Radium-228	EPA 904.0	**4.54 ± 1.07 (0.843) C:74% T:74%**	pCi/L	07/18/16 15:44	15262-20-1	
Total Radium	Total Radium Calculation	**7.50 ± 2.03 (1.34)**	pCi/L	07/20/16 12:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: MW-102M **Lab ID: 60222211004** Collected: 06/23/16 07:15 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.580 ± 0.583 (0.908) C:NA T:90%**	pCi/L	07/18/16 12:19	13982-63-3	
Radium-228	EPA 904.0	**1.08 ± 0.447 (0.682) C:78% T:77%**	pCi/L	07/18/16 15:44	15262-20-1	
Total Radium	Total Radium Calculation	**1.66 ± 1.03 (1.59)**	pCi/L	07/20/16 12:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: MW-122M **Lab ID: 60222211005** Collected: 06/23/16 08:00 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.560 ± 0.518 (0.754) C:NA T:84%**	pCi/L	07/18/16 12:17	13982-63-3	
Radium-228	EPA 904.0	**0.691 ± 0.367 (0.633) C:74% T:84%**	pCi/L	07/18/16 15:44	15262-20-1	
Total Radium	Total Radium Calculation	**1.25 ± 0.885 (1.39)**	pCi/L	07/20/16 12:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Sample: FIELD BLANK **Lab ID: 60222211006** Collected: 06/22/16 12:10 Received: 06/25/16 08:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.188 ± 0.286 (0.752) C:NA T:97%**	pCi/L	07/18/16 12:17	13982-63-3	
Radium-228	EPA 904.0	**0.406 ± 0.354 (0.707) C:75% T:77%**	pCi/L	07/18/16 15:44	15262-20-1	
Total Radium	Total Radium Calculation	**0.406 ± 0.640 (1.459)**	pCi/L	07/20/16 11:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

QC Batch: 225572 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60222211001, 60222211002, 60222211003, 60222211004, 60222211005, 60222211006

METHOD BLANK: 1104860 Matrix: Water
Associated Lab Samples: 60222211001, 60222211002, 60222211003, 60222211004, 60222211005, 60222211006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.231 ± 0.288 (0.609) C:78% T:92%	pCi/L	07/18/16 15:57	

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 Midland LF/25216073
Pace Project No.: 60222211

QC Batch: 225552 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60222211001, 60222211002, 60222211003, 60222211004, 60222211005, 60222211006

METHOD BLANK: 1104840 Matrix: Water
Associated Lab Samples: 60222211001, 60222211002, 60222211003, 60222211004, 60222211005, 60222211006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.325 ± 0.339 (0.478) C:NA T:92%	pCi/L	07/18/16 11:43	

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 Midland LF/25216073
Pace Project No.: 60222211

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60222211

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60222211001	**MW-301**	EPA 903.1	225552		
60222211002	**MW-302**	EPA 903.1	225552		
60222211003	**MW-303**	EPA 903.1	225552		
60222211004	**MW-102M**	EPA 903.1	225552		
60222211005	**MW-122M**	EPA 903.1	225552		
60222211006	**FIELD BLANK**	EPA 903.1	225552		
60222211001	**MW-301**	EPA 904.0	225572		
60222211002	**MW-302**	EPA 904.0	225572		
60222211003	**MW-303**	EPA 904.0	225572		
60222211004	**MW-102M**	EPA 904.0	225572		
60222211005	**MW-122M**	EPA 904.0	225572		
60222211006	**FIELD BLANK**	EPA 904.0	225572		
60222211001	**MW-301**	Total Radium Calculation	226926		
60222211002	**MW-302**	Total Radium Calculation	285975		
60222211003	**MW-303**	Total Radium Calculation	226926		
60222211004	**MW-102M**	Total Radium Calculation	226926		
60222211005	**MW-122M**	Total Radium Calculation	226926		
60222211006	**FIELD BLANK**	Total Radium Calculation	285986		

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Sample Condition Upon Receipt

WO# : 60222211

60222211

Client Name: SCS

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7834 4170 1918 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 -0.1 T-239 / CF 0.0 T-262 **Type of Ice:** (Wet) Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 2.0

Date and initials of person examining contents: JB 6/27

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☐Yes ☒No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: WT		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Trip Blank present:	☐Yes ☐No ☒N/A	
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 6.27.16

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www.pacelabs.com

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:
Requested Due Date/TAT:	

Section B — **Required** Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	6/22/16	12:30	14.3	2			2							X	X	X		(2) BP1N 2.0 60222211
2	MW-302	WT	G	xxx	xxx	↓	11:30	14.0	2			2							X	X	X		002
3	MW-303	WT	G	xxx	xxx	↓	10:15	14.8	2			2							X	X	X		003
4	MW-102M	WT	G	xxx	xxx	6/23/16	7:15	14.2	2			2							X	X	X		004
5	MW-122M	WT	G	xxx	xxx	↓	8:20	14.9	2			2							X	X	X		005
6	FIELD BLANK	WT	G	xxx	xxx	6/22/16	12:10	—	2			2							X	X	X		006
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219					6/25	0850	2.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Paul A. Grover

SIGNATURE of SAMPLER: Paul A. Grover DATE Signed (MM/DD/YY): 6/24/16

*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

WO#:30188065

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www.pacelabs.com

Workorder: 60222211 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 6/25/2016 **Results Requested By:** 7/20/2016

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: HNO3						Requested Analysis: 903.1 Radium-226	904.0 Radium-228	Total Radium									LAB USE ONLY
1	MW-301	PS	6/22/2016 12:30	60222211001	Water	2						X	X	X									001
2	MW-302	PS	6/22/2016 11:30	60222211002	Water	2						X	X	X									002
3	MW-303	PS	6/22/2016 10:15	60222211003	Water	2						X	X	X									003
4	MW-102M	PS	6/23/2016 07:15	60222211004	Water	2						X	X	X									004
5	MW-122M	PS	6/23/2016 08:00	60222211005	Water	2						X	X	X									005
6	FIELD BLANK	PS	6/22/2016 12:10	60222211006	Water	2						X	X										006

Transfers	Released By	Date/Time	Received	Date/Time
1	[signature]	6/27/16 1700	Ben Macentire	6-28-16 10:30
2				
3				

Comments

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.*

Sample Condition Upon Receipt Pittsburgh

Pace Analytical

Client Name: Pace Kansas Project # 30188065

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 6703 1645 4608

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** N/A °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ALM 6-28-16

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: -Includes date/time/ID/Analysis Matrix: WT				5.
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: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Filtered volume received for Dissolved tests			✓	12.
All containers needing preservation have been checked. All containers needing preservation are found to be in compliance with EPA recommendation.	✓ ✓			13. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed BLM; Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	14.
Trip Blank Present:			✓	15.
Trip Blank Custody Seals Present			✓	

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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)

A3 Round 3 Background Sampling, Analytical Laboratory Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

October 11, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on August 12, 2016. 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.

Amended Report, Revision 1 on 10/11/16, Groundwater Elevation Corrections

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

Sincerely,

Trudy Gipson

Trudy Gipson
trudy.gipson@pacelabs.com
Project Manager

Enclosures

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification: 10070
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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60225563001	**MW-301**	Water	08/09/16 16:40	08/12/16 08:30
60225563002	**MW-302**	Water	08/10/16 10:05	08/12/16 08:30
60225563003	**MW-303**	Water	08/09/16 20:50	08/12/16 08:30
60225563004	**MW-102M**	Water	08/10/16 11:40	08/12/16 08:30
60225563005	**MW-122M**	Water	08/10/16 10:35	08/12/16 08:30
60225563006	**FIELD BLANK**	Water	08/10/16 09:50	08/12/16 08:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60225563001	MW-301	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K
60225563002	MW-302	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K
60225563003	MW-303	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K
60225563004	MW-102M	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K
60225563005	MW-122M	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K
60225563006	FIELD BLANK	EPA 6010	JGP	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HAC	1	PASI-K
		EPA 9056	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: MW-301 **Lab ID: 60225563001** Collected: 08/09/16 16:40 Received: 08/12/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/09/16 16:40		
Field pH	**7.81**	Std. Units	0.10	0.050	1		08/09/16 16:40		
Field Temperature	**13.9**	deg C	0.50	0.25	1		08/09/16 16:40		
Field Specific Conductance	**5607**	umhos/cm	1.0	1.0	1		08/09/16 16:40		
Field Oxidation Potential	**-53.0**	mV			1		08/09/16 16:40		
Oxygen, Dissolved	**0.10**	mg/L			1		08/09/16 16:40	7782-44-7	
Turbidity	**1.05**	NTU	1.0	1.0	1		08/09/16 16:40		
Groundwater Elevation	**686.19**	feet			1		08/09/16 16:40		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1770**	ug/L	100	50.0	1	08/15/16 16:00	08/16/16 16:32	7440-42-8	
Calcium	**479**	mg/L	0.10	0.0081	1	08/15/16 16:00	08/16/16 16:32	7440-70-2	
Lithium	**195**	ug/L	10.0	4.9	1	08/15/16 16:00	08/16/16 16:32	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	ND	ug/L	2.0	0.12	2	08/15/16 16:00	08/22/16 15:45	7440-36-0	D3
Arsenic	**0.29J**	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:45	7440-38-2	
Barium	**24.2**	ug/L	2.0	0.28	2	08/15/16 16:00	08/22/16 15:45	7440-39-3	
Beryllium	ND	ug/L	1.0	0.16	2	08/15/16 16:00	08/22/16 15:45	7440-41-7	D3
Cadmium	ND	ug/L	1.0	0.058	2	08/15/16 16:00	08/22/16 15:45	7440-43-9	D3
Chromium	ND	ug/L	2.0	0.68	2	08/15/16 16:00	08/22/16 15:45	7440-47-3	D3
Cobalt	ND	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:45	7440-48-4	D3
Lead	ND	ug/L	2.0	0.39	2	08/15/16 16:00	08/22/16 15:45	7439-92-1	D3
Molybdenum	**2.1**	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:45	7439-98-7	
Selenium	ND	ug/L	2.0	0.37	2	08/15/16 16:00	08/22/16 15:45	7782-49-2	D3
Thallium	ND	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:45	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470	Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 13:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**5810**	mg/L	5.0	5.0	1		08/16/16 15:11		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**46.6**	mg/L	5.0	2.5	5		08/19/16 13:12	16887-00-6	
Fluoride	**0.55**	mg/L	0.20	0.027	1		08/16/16 15:50	16984-48-8	
Sulfate	**4050**	mg/L	500	77.2	500		08/20/16 10:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: MW-302 **Lab ID: 60225563002** Collected: 08/10/16 10:05 Received: 08/12/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/10/16 10:05		
Field pH	**9.55**	Std. Units	0.10	0.050	1		08/10/16 10:05		
Field Temperature	**13.9**	deg C	0.50	0.25	1		08/10/16 10:05		
Field Specific Conductance	**1102**	umhos/cm	1.0	1.0	1		08/10/16 10:05		
Field Oxidation Potential	**-100.7**	mV			1		08/10/16 10:05		
Oxygen, Dissolved	**0.10**	mg/L			1		08/10/16 10:05	7782-44-7	
Turbidity	**74.76**	NTU	1.0	1.0	1		08/10/16 10:05		
Groundwater Elevation	**685.48**	feet			1		08/10/16 10:05		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**802**	ug/L	100	50.0	1	08/15/16 16:00	08/16/16 16:35	7440-42-8	
Calcium	**48.8**	mg/L	0.10	0.0081	1	08/15/16 16:00	08/16/16 16:35	7440-70-2	
Lithium	**75.9**	ug/L	10.0	4.9	1	08/15/16 16:00	08/16/16 16:35	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.095J**	ug/L	1.0	0.058	1	08/15/16 16:00	08/19/16 14:25	7440-36-0	B
Arsenic	**0.28J**	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:25	7440-38-2	
Barium	**50.0**	ug/L	1.0	0.14	1	08/15/16 16:00	08/19/16 14:25	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	08/15/16 16:00	08/19/16 14:25	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	08/15/16 16:00	08/19/16 14:25	7440-43-9	
Chromium	**1.9**	ug/L	1.0	0.34	1	08/15/16 16:00	08/19/16 14:25	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:25	7440-48-4	
Lead	**0.32J**	ug/L	1.0	0.19	1	08/15/16 16:00	08/19/16 14:25	7439-92-1	
Molybdenum	**0.31J**	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:25	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	08/15/16 16:00	08/19/16 14:25	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:25	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 14:06	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**671**	mg/L	5.0	5.0	1		08/17/16 14:13		
9040 pH	Analytical Method: EPA 9040								
pH	**7.3**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.5**	mg/L	1.0	0.50	1		08/19/16 13:41	16887-00-6	
Fluoride	**0.98**	mg/L	0.20	0.027	1		08/19/16 13:41	16984-48-8	
Sulfate	**102**	mg/L	10.0	1.5	10		08/19/16 14:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: MW-303 **Lab ID: 60225563003** Collected: 08/09/16 20:50 Received: 08/12/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/09/16 20:50		
Field pH	**7.84**	Std. Units	0.10	0.050	1		08/09/16 20:50		
Field Temperature	**14.0**	deg C	0.50	0.25	1		08/09/16 20:50		
Field Specific Conductance	**3419**	umhos/cm	1.0	1.0	1		08/09/16 20:50		
Field Oxidation Potential	**-76.7**	mV			1		08/09/16 20:50		
Oxygen, Dissolved	**0.08**	mg/L			1		08/09/16 20:50	7782-44-7	
Turbidity	**169.9**	NTU	1.0	1.0	1		08/09/16 20:50		
Groundwater Elevation	**687.77**	feet			1		08/09/16 20:50		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1640**	ug/L	100	50.0	1	08/15/16 16:00	08/16/16 16:37	7440-42-8	
Calcium	**250**	mg/L	0.10	0.0081	1	08/15/16 16:00	08/16/16 16:37	7440-70-2	
Lithium	**126**	ug/L	10.0	4.9	1	08/15/16 16:00	08/16/16 16:37	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	ND	ug/L	2.0	0.12	2	08/15/16 16:00	08/22/16 15:49	7440-36-0	D3
Arsenic	ND	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:49	7440-38-2	D3
Barium	**19.3**	ug/L	2.0	0.28	2	08/15/16 16:00	08/22/16 15:49	7440-39-3	
Beryllium	**0.16J**	ug/L	1.0	0.16	2	08/15/16 16:00	08/22/16 15:49	7440-41-7	
Cadmium	ND	ug/L	1.0	0.058	2	08/15/16 16:00	08/22/16 15:49	7440-43-9	D3
Chromium	**2.7**	ug/L	2.0	0.68	2	08/15/16 16:00	08/22/16 15:49	7440-47-3	
Cobalt	**1.2J**	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:49	7440-48-4	
Lead	**0.51J**	ug/L	2.0	0.39	2	08/15/16 16:00	08/22/16 15:49	7439-92-1	
Molybdenum	**0.69J**	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:49	7439-98-7	
Selenium	ND	ug/L	2.0	0.37	2	08/15/16 16:00	08/22/16 15:49	7782-49-2	D3
Thallium	ND	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:49	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470	Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 14:08	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**2750**	mg/L	5.0	5.0	1		08/16/16 15:11		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.7**	mg/L	1.0	0.50	1		08/16/16 17:29	16887-00-6	
Fluoride	**0.90**	mg/L	0.20	0.027	1		08/16/16 17:29	16984-48-8	
Sulfate	**1950**	mg/L	100	15.4	100		08/20/16 11:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: MW-102M **Lab ID: 60225563004** Collected: 08/10/16 11:40 Received: 08/12/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/10/16 11:40		
Groundwater Elevation	**715.65**	feet			1		08/10/16 11:40		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1480**	ug/L	100	50.0	1	08/15/16 16:00	08/16/16 16:39	7440-42-8	
Calcium	**129**	mg/L	0.10	0.0081	1	08/15/16 16:00	08/16/16 16:39	7440-70-2	
Lithium	**52.3**	ug/L	10.0	4.9	1	08/15/16 16:00	08/16/16 16:39	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**0.17J**	ug/L	1.0	0.058	1	08/15/16 16:00	08/19/16 14:33	7440-36-0	B
Arsenic	**0.78J**	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:33	7440-38-2	
Barium	**55.4**	ug/L	1.0	0.14	1	08/15/16 16:00	08/19/16 14:33	7440-39-3	
Beryllium	**1.1**	ug/L	0.50	0.080	1	08/15/16 16:00	08/19/16 14:33	7440-41-7	
Cadmium	**0.078J**	ug/L	0.50	0.029	1	08/15/16 16:00	08/19/16 14:33	7440-43-9	
Chromium	**27.1**	ug/L	1.0	0.34	1	08/15/16 16:00	08/19/16 14:33	7440-47-3	
Cobalt	**7.3**	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:33	7440-48-4	
Lead	**3.8**	ug/L	1.0	0.19	1	08/15/16 16:00	08/19/16 14:33	7439-92-1	
Molybdenum	**20.9**	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:33	7439-98-7	
Selenium	**1.4**	ug/L	1.0	0.18	1	08/15/16 16:00	08/19/16 14:33	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:33	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470	Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 14:10	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1620**	mg/L	5.0	5.0	1		08/17/16 14:14		
9040 pH	Analytical Method: EPA 9040								
pH	**7.9**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**13.4**	mg/L	1.0	0.50	1		08/16/16 17:43	16887-00-6	
Fluoride	**4.4**	mg/L	0.20	0.027	1		08/16/16 17:43	16984-48-8	
Sulfate	**354**	mg/L	50.0	7.7	50		08/19/16 14:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: MW-122M **Lab ID: 60225563005** Collected: 08/10/16 10:35 Received: 08/12/16 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/10/16 10:35		
Groundwater Elevation	**725.16**	feet			1		08/10/16 10:35		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**4550**	ug/L	200	100	2	08/15/16 16:00	08/17/16 14:10	7440-42-8	
Calcium	**419**	mg/L	0.10	0.0081	1	08/15/16 16:00	08/16/16 16:42	7440-70-2	
Lithium	**601**	ug/L	10.0	4.9	1	08/15/16 16:00	08/16/16 16:42	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**0.26J**	ug/L	2.0	0.12	2	08/15/16 16:00	08/22/16 15:53	7440-36-0	B
Arsenic	ND	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:53	7440-38-2	D3
Barium	**14.5**	ug/L	2.0	0.28	2	08/15/16 16:00	08/22/16 15:53	7440-39-3	
Beryllium	ND	ug/L	1.0	0.16	2	08/15/16 16:00	08/22/16 15:53	7440-41-7	D3
Cadmium	ND	ug/L	1.0	0.058	2	08/15/16 16:00	08/22/16 15:53	7440-43-9	D3
Chromium	ND	ug/L	2.0	0.68	2	08/15/16 16:00	08/22/16 15:53	7440-47-3	D3
Cobalt	**3.5**	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:53	7440-48-4	
Lead	ND	ug/L	2.0	0.39	2	08/15/16 16:00	08/22/16 15:53	7439-92-1	D3
Molybdenum	**0.57J**	ug/L	2.0	0.21	2	08/15/16 16:00	08/22/16 15:53	7439-98-7	
Selenium	ND	ug/L	2.0	0.37	2	08/15/16 16:00	08/22/16 15:53	7782-49-2	D3
Thallium	ND	ug/L	2.0	1.0	2	08/15/16 16:00	08/22/16 15:53	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470	Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 14:12	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**14200**	mg/L	5.0	5.0	1		08/17/16 14:15		
9040 pH	Analytical Method: EPA 9040								
pH	**6.1**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**11.8**	mg/L	1.0	0.50	1		08/16/16 17:57	16887-00-6	
Fluoride	**0.74**	mg/L	0.20	0.027	1		08/16/16 17:57	16984-48-8	
Sulfate	**8950**	mg/L	1000	154	1000		08/19/16 15:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Sample: FIELD BLANK **Lab ID: 60225563006** Collected: 08/10/16 09:50 Received: 08/12/16 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	50.0	1	08/15/16 16:00	08/17/16 14:06	7440-42-8	
Calcium	ND	mg/L	0.10	0.0081	1	08/15/16 16:00	08/17/16 14:06	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	08/15/16 16:00	08/17/16 14:06	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.066J**	ug/L	1.0	0.058	1	08/15/16 16:00	08/19/16 14:42	7440-36-0	B
Arsenic	ND	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:42	7440-38-2	
Barium	**0.42J**	ug/L	1.0	0.14	1	08/15/16 16:00	08/19/16 14:42	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.080	1	08/15/16 16:00	08/19/16 14:42	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	08/15/16 16:00	08/19/16 14:42	7440-43-9	
Chromium	**0.42J**	ug/L	1.0	0.34	1	08/15/16 16:00	08/19/16 14:42	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:42	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	08/15/16 16:00	08/19/16 14:42	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.10	1	08/15/16 16:00	08/19/16 14:42	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	08/15/16 16:00	08/19/16 14:42	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	08/15/16 16:00	08/19/16 14:42	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	08/16/16 10:40	08/16/16 14:15	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**125**	mg/L	5.0	5.0	1		08/17/16 14:18		
9040 pH	Analytical Method: EPA 9040								
pH	**6.5**	Std. Units	0.10	0.10	1		08/15/16 11:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		08/19/16 15:22	16887-00-6	
Fluoride	ND	mg/L	0.20	0.027	1		08/19/16 15:22	16984-48-8	
Sulfate	ND	mg/L	1.0	0.15	1		08/19/16 15:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442867 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

METHOD BLANK: 1811228 Matrix: Water
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.039	08/16/16 13:50	

LABORATORY CONTROL SAMPLE: 1811229

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1811230 1811231

Parameter	Units	60225563001 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	4.8	4.6	95	93	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442730 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

METHOD BLANK: 1810938 Matrix: Water
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	50.0	08/16/16 16:16	
Calcium	mg/L	0.011J	0.10	0.0081	08/16/16 16:16	
Lithium	ug/L	ND	10.0	4.9	08/16/16 16:16	

LABORATORY CONTROL SAMPLE: 1810939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	983	98	80-120	
Calcium	mg/L	10	10.3	103	80-120	
Lithium	ug/L	1000	1050	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1810940 1810941

Parameter	Units	60225582009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	275	1000	1000	1210	1210	93	94	75-125	0	20	
Calcium	mg/L	146000 ug/L	10	10	156	155	109	96	75-125	1	20	
Lithium	ug/L	60.5	1000	1000	1120	1130	106	107	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442731 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

METHOD BLANK: 1810942 Matrix: Water
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.068J	1.0	0.058	08/19/16 14:03	
Arsenic	ug/L	ND	1.0	0.10	08/19/16 14:03	
Barium	ug/L	0.21J	1.0	0.14	08/19/16 14:03	
Beryllium	ug/L	ND	0.50	0.080	08/19/16 14:03	
Cadmium	ug/L	ND	0.50	0.029	08/19/16 14:03	
Chromium	ug/L	ND	1.0	0.34	08/19/16 14:03	
Cobalt	ug/L	ND	1.0	0.50	08/19/16 14:03	
Lead	ug/L	ND	1.0	0.19	08/19/16 14:03	
Molybdenum	ug/L	ND	1.0	0.10	08/19/16 14:03	
Selenium	ug/L	ND	1.0	0.18	08/19/16 14:03	
Thallium	ug/L	ND	1.0	0.50	08/19/16 14:03	

LABORATORY CONTROL SAMPLE: 1810943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.7	102	80-120	
Arsenic	ug/L	40	41.1	103	80-120	
Barium	ug/L	40	40.4	101	80-120	
Beryllium	ug/L	40	41.9	105	80-120	
Cadmium	ug/L	40	41.4	103	80-120	
Chromium	ug/L	40	41.5	104	80-120	
Cobalt	ug/L	40	40.9	102	80-120	
Lead	ug/L	40	40.4	101	80-120	
Molybdenum	ug/L	40	42.1	105	80-120	
Selenium	ug/L	40	41.5	104	80-120	
Thallium	ug/L	40	38.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1810944 1810945

Parameter	Units	60225563001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	37.4	38.6	93	96	75-125	3	20	
Arsenic	ug/L	0.29J	40	40	39.1	39.7	97	98	75-125	1	20	
Barium	ug/L	24.2	40	40	62.0	64.3	94	100	75-125	4	20	
Beryllium	ug/L	ND	40	40	34.6	34.9	87	87	75-125	1	20	
Cadmium	ug/L	ND	40	40	32.1	32.5	80	81	75-125	1	20	
Chromium	ug/L	ND	40	40	40.8	41.3	101	102	75-125	1	20	
Cobalt	ug/L	ND	40	40	38.9	39.5	96	98	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1810944 1810945

Parameter	Units	60225563001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	35.9	36.3	90	91	75-125	1	20	
Molybdenum	ug/L	2.1	40	40	42.6	43.2	101	103	75-125	2	20	
Selenium	ug/L	ND	40	40	38.9	39.1	97	98	75-125	1	20	
Thallium	ug/L	ND	40	40	35.3	35.8	88	89	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442658 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60225563001, 60225563003

METHOD BLANK: 1810790 Matrix: Water
Associated Lab Samples: 60225563001, 60225563003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	08/16/16 15:06	

LABORATORY CONTROL SAMPLE: 1810791

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 1810792

Parameter	Units	60225506001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	911	906	1	10	

SAMPLE DUPLICATE: 1810793

Parameter	Units	60225430001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1760	1720	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 443024 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60225563002, 60225563004, 60225563005, 60225563006

METHOD BLANK: 1811778 Matrix: Water
Associated Lab Samples: 60225563002, 60225563004, 60225563005, 60225563006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	08/17/16 13:28	

LABORATORY CONTROL SAMPLE: 1811779

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	986	99	80-120	

SAMPLE DUPLICATE: 1811780

Parameter	Units	60225430012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3920	4060	4	10	

SAMPLE DUPLICATE: 1811781

Parameter	Units	60225501005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	866	878	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442736 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60225563001, 60225563002, 60225563003, 60225563004, 60225563005, 60225563006

SAMPLE DUPLICATE: 1810948

Parameter	Units	60225563001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.2	6.2	1	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 442844 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60225563001, 60225563003, 60225563004, 60225563005

METHOD BLANK: 1811165 Matrix: Water
Associated Lab Samples: 60225563001, 60225563003, 60225563004, 60225563005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	08/16/16 15:22	
Fluoride	mg/L	ND	0.20	0.027	08/16/16 15:22	

LABORATORY CONTROL SAMPLE: 1811166

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	80-120	
Fluoride	mg/L	2.5	2.3	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1811167 1811168

Parameter	Units	60225563001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.55	2.5	2.5	2.7	2.9	86	93	80-120	7	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 443014 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60225563001, 60225563002, 60225563004, 60225563005, 60225563006

METHOD BLANK: 1811757 Matrix: Water
Associated Lab Samples: 60225563001, 60225563002, 60225563004, 60225563005, 60225563006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	08/19/16 08:57	
Fluoride	mg/L	ND	0.20	0.027	08/19/16 08:57	
Sulfate	mg/L	ND	1.0	0.15	08/19/16 08:57	

LABORATORY CONTROL SAMPLE: 1811758

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	95	80-120	
Sulfate	mg/L	5	4.7	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1811759 1811760

Parameter	Units	60225499005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	40.6	25	25	65.4	65.6	99	100	80-120	0	15	
Fluoride	mg/L	0.30			5.2	5.1				2	15	
Sulfate	mg/L	22.0	10	10	32.6	32.3	106	103	80-120	1	15	

SAMPLE DUPLICATE: 1811761

Parameter	Units	60225499006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	35.3	35.0	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

QC Batch: 443570 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60225563001, 60225563003

METHOD BLANK: 1814091 Matrix: Water
Associated Lab Samples: 60225563001, 60225563003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	0.15	08/20/16 10:17	

LABORATORY CONTROL SAMPLE: 1814092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1814093 1814094

Parameter	Units	60225563001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	4050	2500	2500	6730	6780	107	109	80-120	1	15	

SAMPLE DUPLICATE: 1814095

Parameter	Units	60225563003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	1950	1910	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60225563001	**MW-301**		443770		
60225563002	**MW-302**		443770		
60225563003	**MW-303**		443770		
60225563004	**MW-102M**		443770		
60225563005	**MW-122M**		443770		
60225563001	**MW-301**	EPA 3010	442730	EPA 6010	442854
60225563002	**MW-302**	EPA 3010	442730	EPA 6010	442854
60225563003	**MW-303**	EPA 3010	442730	EPA 6010	442854
60225563004	**MW-102M**	EPA 3010	442730	EPA 6010	442854
60225563005	**MW-122M**	EPA 3010	442730	EPA 6010	442854
60225563006	**FIELD BLANK**	EPA 3010	442730	EPA 6010	442854
60225563001	**MW-301**	EPA 3010	442731	EPA 6020	442851
60225563002	**MW-302**	EPA 3010	442731	EPA 6020	442851
60225563003	**MW-303**	EPA 3010	442731	EPA 6020	442851
60225563004	**MW-102M**	EPA 3010	442731	EPA 6020	442851
60225563005	**MW-122M**	EPA 3010	442731	EPA 6020	442851
60225563006	**FIELD BLANK**	EPA 3010	442731	EPA 6020	442851
60225563001	**MW-301**	EPA 7470	442867	EPA 7470	442895
60225563002	**MW-302**	EPA 7470	442867	EPA 7470	442895
60225563003	**MW-303**	EPA 7470	442867	EPA 7470	442895
60225563004	**MW-102M**	EPA 7470	442867	EPA 7470	442895
60225563005	**MW-122M**	EPA 7470	442867	EPA 7470	442895
60225563006	**FIELD BLANK**	EPA 7470	442867	EPA 7470	442895
60225563001	**MW-301**	SM 2540C	442658		
60225563002	**MW-302**	SM 2540C	443024		
60225563003	**MW-303**	SM 2540C	442658		
60225563004	**MW-102M**	SM 2540C	443024		
60225563005	**MW-122M**	SM 2540C	443024		
60225563006	**FIELD BLANK**	SM 2540C	443024		
60225563001	**MW-301**	EPA 9040	442736		
60225563002	**MW-302**	EPA 9040	442736		
60225563003	**MW-303**	EPA 9040	442736		
60225563004	**MW-102M**	EPA 9040	442736		
60225563005	**MW-122M**	EPA 9040	442736		
60225563006	**FIELD BLANK**	EPA 9040	442736		
60225563001	**MW-301**	EPA 9056	442844		
60225563001	**MW-301**	EPA 9056	443014		
60225563001	**MW-301**	EPA 9056	443570		
60225563002	**MW-302**	EPA 9056	443014		
60225563003	**MW-303**	EPA 9056	442844		
60225563003	**MW-303**	EPA 9056	443570		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225563

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60225563004	**MW-102M**	EPA 9056	442844		
60225563004	**MW-102M**	EPA 9056	443014		
60225563005	**MW-122M**	EPA 9056	442844		
60225563005	**MW-122M**	EPA 9056	443014		
60225563006	**FIELD BLANK**	EPA 9056	443014		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60225563

60225563

Client Name: SCS Eng.

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7838 0688 1722 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 +1.1 T-266 / CF -0.1 T-239

Type of Ice: (Wet) Blue None (circle one) ☐ Samples received on ice, cooling process has begun.

Cooler Temperature: 3.1

Date and initials of person examining contents: JMS 8/12/16 1055

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	6. pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC:	☒Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: water		13.
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☒Yes ☐No	Initial when completed JMS / Lot # of added preservative
Trip Blank present:	☐Yes ☐No ☒N/A	
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☒N/A	18.

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 8/12

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical www.pacelabs.com

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

Page: 1 of 1

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 Midland Landfill
Project Number:	25216073

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 CCR

Site Location STATE: IA

Section D Required Client Information

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): 6010 Total Metals: B-Ca-Li — N; 6020 Total Metals * — N; 7470 Total Hg — N

Pace Project No./ Lab I.D.: 60225563

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	8-9-16	16:40	13.9	2	1		1						X	X	X	X	X	X		(BP2N) 2(BP3N)[2] 01
2	MW-302	WT	G	xxx	xxx	8-10-16	18:05	13.9	2	1		1						X	X	X	X	X	X		02
3	MW-303	WT	G	xxx	xxx	8-9-16	20:50	14.0	2	1		1						X	X	X	X	X	X		03
4	MW-102M	WT	G	xxx	xxx	8-10-16	11:40	NA	2	1		1						X	X	X	X	X	X		04
5	MW-122M	WT	G	xxx	xxx	↓	10:35	NA	2	1		1						X	X	X	X	X	X		05
6	FIELD BLANK	WT	G	xxx	xxx	↓	9:50	—	2	1		1						X	X	X	X	X	X		06
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. [signature] SCS	8-11-16	9:30	[signature] / Pace	8/12/16	830	3.1	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

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.

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

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September 07, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on August 12, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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
trudy.gipson@pacelabs.com
Project Manager

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60225570001	**MW-301**	Water	08/09/16 16:40	08/12/16 08:30
60225570002	**MW-302**	Water	08/10/16 10:05	08/12/16 08:30
60225570003	**MW-303**	Water	08/09/16 20:50	08/12/16 08:30
60225570004	**MW-102M**	Water	08/10/16 11:40	08/12/16 08:30
60225570005	**MW-122M**	Water	08/10/16 10:35	08/12/16 08:30
60225570006	**FIELD BLANK**	Water	08/10/16 09:50	08/12/16 08:30

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60225570001	**MW-301**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60225570002	**MW-302**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60225570003	**MW-303**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60225570004	**MW-102M**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60225570005	**MW-122M**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60225570006	**FIELD BLANK**	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: MW-301 **Lab ID: 60225570001** Collected: 08/09/16 16:40 Received: 08/12/16 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	**0.606 ± 0.443 (0.495) C:NA T:84%**	pCi/L	09/02/16 00:55	13982-63-3	
Radium-228	EPA 904.0	**1.28 ± 0.520 (0.816) C:67% T:85%**	pCi/L	08/31/16 12:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.89 ± 0.963 (1.31)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: MW-302 **Lab ID: 60225570002** Collected: 08/10/16 10:05 Received: 08/12/16 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	**0.426 ± 0.522 (0.852) C:NA T:80%**	pCi/L	09/02/16 00:56	13982-63-3	
Radium-228	EPA 904.0	**0.744 ± 0.428 (0.764) C:68% T:77%**	pCi/L	08/31/16 12:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.17 ± 0.950 (1.62)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: MW-303 **Lab ID: 60225570003** Collected: 08/09/16 20:50 Received: 08/12/16 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	**1.26 ± 0.628 (0.645) C:NA T:90%**	pCi/L	09/02/16 00:57	13982-63-3	
Radium-228	EPA 904.0	**2.33 ± 0.693 (0.756) C:57% T:86%**	pCi/L	08/31/16 12:07	15262-20-1	
Total Radium	Total Radium Calculation	**3.59 ± 1.32 (1.40)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: MW-102M **Lab ID: 60225570004** Collected: 08/10/16 11:40 Received: 08/12/16 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	**0.144 ± 0.328 (0.528) C:NA T:82%**	pCi/L	09/02/16 01:01	13982-63-3	
Radium-228	EPA 904.0	**1.03 ± 0.447 (0.719) C:71% T:84%**	pCi/L	08/31/16 12:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.17 ± 0.775 (1.25)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: MW-122M **Lab ID: 60225570005** Collected: 08/10/16 10:35 Received: 08/12/16 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	**0.750 ± 0.589 (0.819) C:NA T:83%**	pCi/L	09/02/16 01:10	13982-63-3	
Radium-228	EPA 904.0	**1.51 ± 0.534 (0.742) C:69% T:83%**	pCi/L	08/31/16 12:07	15262-20-1	
Total Radium	Total Radium Calculation	**2.26 ± 1.12 (1.56)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Sample: FIELD BLANK **Lab ID: 60225570006** Collected: 08/10/16 09:50 Received: 08/12/16 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	**0.127 ± 0.465 (0.894) C:NA T:88%**	pCi/L	09/02/16 00:58	13982-63-3	
Radium-228	EPA 904.0	**0.0781 ± 0.343 (0.779) C:72% T:85%**	pCi/L	08/31/16 12:11	15262-20-1	
Total Radium	Total Radium Calculation	**0.205 ± 0.808 (1.67)**	pCi/L	09/07/16 13:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

QC Batch: 231099 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60225570001, 60225570002, 60225570003, 60225570004, 60225570005, 60225570006

METHOD BLANK: 1132288 Matrix: Water
Associated Lab Samples: 60225570001, 60225570002, 60225570003, 60225570004, 60225570005, 60225570006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.283 (0.635) C:NA T:90%	pCi/L	09/01/16 23:00	

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

Pace Analytical Services, Inc.
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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

QC Batch: 231100 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60225570001, 60225570002, 60225570003, 60225570004, 60225570005, 60225570006

METHOD BLANK: 1132292 Matrix: Water
Associated Lab Samples: 60225570001, 60225570002, 60225570003, 60225570004, 60225570005, 60225570006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.543 ± 0.335 (0.614) C:77% T:86%	pCi/L	08/31/16 12:05	

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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

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

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60225570

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60225570001	**MW-301**	EPA 903.1	231099		
60225570002	**MW-302**	EPA 903.1	231099		
60225570003	**MW-303**	EPA 903.1	231099		
60225570004	**MW-102M**	EPA 903.1	231099		
60225570005	**MW-122M**	EPA 903.1	231099		
60225570006	**FIELD BLANK**	EPA 903.1	231099		
60225570001	**MW-301**	EPA 904.0	231100		
60225570002	**MW-302**	EPA 904.0	231100		
60225570003	**MW-303**	EPA 904.0	231100		
60225570004	**MW-102M**	EPA 904.0	231100		
60225570005	**MW-122M**	EPA 904.0	231100		
60225570006	**FIELD BLANK**	EPA 904.0	231100		
60225570001	**MW-301**	Total Radium Calculation	232351		
60225570002	**MW-302**	Total Radium Calculation	232351		
60225570003	**MW-303**	Total Radium Calculation	232351		
60225570004	**MW-102M**	Total Radium Calculation	232351		
60225570005	**MW-122M**	Total Radium Calculation	232351		
60225570006	**FIELD BLANK**	Total Radium Calculation	232351		

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Sample Condition Upon Receipt

WO# : 60225570

60225570

Client Name: SCS Eng.

Optional
Proj Due Date:
Proj Name:

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 8102 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 +1.1 T-266 / CF -0.1 T-239 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 4.7

Temperature should be above freezing to 6°C

Date and initials of person examining contents: JWS 8/12/16 955

Chain of Custody present:	☑Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☑Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☑Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☑Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	7.
Sufficient volume:	☑Yes ☐No ☐N/A	8.
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	9.
Containers intact:	☑Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	12.
Sample labels match COC:	☑Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: water		13.
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	☐Yes ☑No	Initial when completed: MA / Lot # of added preservative:
Trip Blank present:	☐Yes ☐No ☑N/A	
Pace Trip Blank lot # (if purchased): MA		15.
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☑N/A	17. List State:
Additional labels attached to 5035A vials in the field?	☐Yes ☐No ☑N/A	18.

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: for [illegible] Date: 8/12

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CHAIN-OF-[illegible] Analytical Request Document

The Chain-of-Custody is a LEG[illegible]OCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

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	Copy To: Tom Karwaski	Company Name: SCS Engineers
Madison WI 53718		Address:
Email To: mblodgett@scsengineers.com	Purchase Order No.:	Pace Quote Reference:
Phone: 608-216-7362 Fax:	Project Name: Ottumwa Midland Landfill	Pace Project Manager: Trudy Gipson 913-563-1405
Requested Due Date/TAT:	Project Number: 25216073	Pace Profile #: 6696 Line 2

REGULATORY AGENCY

NPDES [X] GROUND WATER [ ] DRINKING WATER

[ ] UST [ ] RCRA [X] OTHER CCR

Site Location STATE: IA

Requested Analysis Filtered (Y/N)

ITEM #	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 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: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301		WT	G	xxx	xxx	8-9-16	16:40		2			2							X	X	X		60225570 AQ
2	MW-302		WT	G	xxx	xxx	8-10-16	10:05		2			2							X	X	X		AR
3	MW-303		WT	G	xxx	xxx	8-9-16	20:50		2			2							X	X	X		AS
4	MW-102M		WT	G	xxx	xxx	8-10-16	11:40	NA	2			2							X	X	X		AT
5	MW-122M		WT	G	xxx	xxx	↓	10:35	NA	2			2							X	X	X		AU
6	FIELD BLANK		WT	G	xxx	xxx	↓	9:50	—	2			2							X	X	X		AV
7																								
8																								
9																								
10																								
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. Lucas SCS	8-11-16	19:30	[signature]	8/12/16	830	4-7	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
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.

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

Chain of Custody

WO#:30193257

Pace Analytical®
www.pacelabs.com

Workorder: 60225570 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 8/12/2016 **Results Requested By:** 9/7/2016

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 HNO3						Requested Analysis 903.1 Radium-226	904.0 Radium-228	Total Radium										LAB USE ONLY
1	MW-301	PS	8/9/2016 16:40	60225570001	Water	2						X	X	X										001
2	MW-302	PS	8/10/2016 10:05	60225570002	Water	2						X	X	X										002
3	MW-303	PS	8/9/2016 20:50	60225570003	Water	2						X	X	X										003
4	MW-102M	PS	8/10/2016 11:40	60225570004	Water	2						X	X	X										004
5	MW-122M	PS	8/10/2016 10:35	60225570005	Water	2						X	X	X										005
6	FIELD BLANK	PS	8/10/2016 09:50	60225570006	Water	2						X	X	X										006

Transfers	Released By	Date/Time	Received	Date/Time
1		8/15/16 1700	Karen E. Hill	8/16/16 1000
2				
3				

Comments

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.*

Sample Condition Upon Receipt Pittsburgh

Pace Analytical

Client Name: Pace Kansas Project # 30193257

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 6703 1647 6863

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 N/A °C Correction Factor: N/A °C Final Temp: N/A °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KH 8/16/16

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: -Includes date/time/ID/Analysis Matrix: WT	✓			5.
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.
Filtered volume received for Dissolved tests			✓	12.
All containers needing preservation have been checked.	✓			13. pH <2
All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓			Initial when completed KH Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	14.
Trip Blank Present:			✓	15.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: KH Date: 8/16/16

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 14, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2016. 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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60231110001	**MW 301**	Water	10/26/16 13:45	10/29/16 08:25
60231110002	**MW 302**	Water	10/26/16 10:15	10/29/16 08:25
60231110003	**MW 303**	Water	10/26/16 12:00	10/29/16 08:25
60231110004	**MW 102M**	Water	10/26/16 14:25	10/29/16 08:25
60231110005	**MW 122M**	Water	10/26/16 15:00	10/29/16 08:25
60231110006	**FIELD BLANK**	Water	10/26/16 14:00	10/29/16 08:25

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231110001	**MW 301**	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K
60231110002	**MW 302**	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K
60231110003	**MW 303**	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP, SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K
60231110004	**MW 102M**	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP, SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K
60231110005	**MW 122M**	EPA 6010	SMW	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K
60231110006	**FIELD BLANK**	EPA 6010	SMW	3	PASI-K
		EPA 6020	JGP, SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	AGO	1	PASI-K
		EPA 9056	OL	3	PASI-K

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: MW 301 **Lab ID: 60231110001** Collected: 10/26/16 13:45 Received: 10/29/16 08:25 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	**1410**	ug/L	500	250	5	10/31/16 16:00	11/01/16 14:00	7440-42-8	
Calcium	**393**	mg/L	0.50	0.041	5	10/31/16 16:00	11/01/16 14:00	7440-70-2	
Lithium	**171**	ug/L	50.0	24.5	5	10/31/16 16:00	11/01/16 14:00	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	10/31/16 16:00	11/10/16 01:49	7440-36-0	
Arsenic	**0.30J**	ug/L	1.0	0.10	1	10/31/16 16:00	11/11/16 12:46	7440-38-2	
Barium	**32.1**	ug/L	1.0	0.14	1	10/31/16 16:00	11/10/16 01:49	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	10/31/16 16:00	11/11/16 12:46	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	10/31/16 16:00	11/11/16 12:46	7440-43-9	
Chromium	**0.46J**	ug/L	1.0	0.34	1	10/31/16 16:00	11/10/16 01:49	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	10/31/16 16:00	11/10/16 01:49	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	10/31/16 16:00	11/11/16 12:46	7439-92-1	
Molybdenum	**2.9**	ug/L	1.0	0.10	1	10/31/16 16:00	11/11/16 12:46	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	10/31/16 16:00	11/11/16 12:46	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	10/31/16 16:00	11/11/16 12:46	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 11:51	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**4030**	mg/L	5.0	5.0	1		11/01/16 10:57		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**43.4**	mg/L	5.0	2.5	5		11/10/16 12:50	16887-00-6	
Fluoride	**0.72**	mg/L	0.20	0.027	1		11/09/16 19:06	16984-48-8	
Sulfate	**2630**	mg/L	200	30.9	200		11/10/16 13:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: MW 302 **Lab ID: 60231110002** Collected: 10/26/16 10:15 Received: 10/29/16 08:25 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	**784**	ug/L	100	50.0	1	10/31/16 16:00	11/01/16 14:03	7440-42-8	
Calcium	**42.8**	mg/L	0.10	0.0081	1	10/31/16 16:00	11/01/16 14:03	7440-70-2	
Lithium	**79.8**	ug/L	10.0	4.9	1	10/31/16 16:00	11/01/16 14:03	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	10/31/16 16:00	11/10/16 01:53	7440-36-0	
Arsenic	**0.24J**	ug/L	1.0	0.10	1	10/31/16 16:00	11/11/16 12:55	7440-38-2	
Barium	**54.0**	ug/L	1.0	0.14	1	10/31/16 16:00	11/10/16 01:53	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	10/31/16 16:00	11/11/16 12:55	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	10/31/16 16:00	11/10/16 01:53	7440-43-9	
Chromium	**1.8**	ug/L	1.0	0.34	1	10/31/16 16:00	11/10/16 01:53	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	10/31/16 16:00	11/10/16 01:53	7440-48-4	
Lead	**0.26J**	ug/L	1.0	0.19	1	10/31/16 16:00	11/10/16 01:53	7439-92-1	
Molybdenum	**0.18J**	ug/L	1.0	0.10	1	10/31/16 16:00	11/10/16 01:53	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	10/31/16 16:00	11/11/16 12:55	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	10/31/16 16:00	11/10/16 01:53	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 11:57	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**644**	mg/L	5.0	5.0	1		11/01/16 10:58		
9040 pH	Analytical Method: EPA 9040								
pH	**7.4**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**6.0**	mg/L	1.0	0.50	1		11/09/16 19:20	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.027	1		11/09/16 19:20	16984-48-8	
Sulfate	**78.9**	mg/L	10.0	1.5	10		11/10/16 13:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: MW 303 **Lab ID: 60231110003** Collected: 10/26/16 12:00 Received: 10/29/16 08:25 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	**1100**	ug/L	100	50.0	1	10/31/16 16:00	11/01/16 14:07	7440-42-8	
Calcium	**157**	mg/L	0.10	0.0081	1	10/31/16 16:00	11/01/16 14:07	7440-70-2	
Lithium	**102**	ug/L	10.0	4.9	1	10/31/16 16:00	11/01/16 14:07	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	11/02/16 17:15	11/09/16 20:08	7440-36-0	
Arsenic	**0.13J**	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:08	7440-38-2	
Barium	**13.4**	ug/L	1.0	0.14	1	11/02/16 17:15	11/09/16 20:08	7440-39-3	
Beryllium	**0.11J**	ug/L	0.50	0.080	1	11/02/16 17:15	11/12/16 20:32	7440-41-7	
Cadmium	**0.037J**	ug/L	0.50	0.029	1	11/02/16 17:15	11/09/16 20:08	7440-43-9	
Chromium	**2.6**	ug/L	1.0	0.34	1	11/02/16 17:15	11/09/16 20:08	7440-47-3	
Cobalt	**1.0**	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:08	7440-48-4	
Lead	**0.57J**	ug/L	1.0	0.19	1	11/02/16 17:15	11/09/16 20:08	7439-92-1	
Molybdenum	**0.43J**	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:08	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	11/02/16 17:15	11/10/16 12:21	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 11:59	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1500**	mg/L	5.0	5.0	1		11/01/16 10:58		
9040 pH	Analytical Method: EPA 9040								
pH	**6.6**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.5**	mg/L	1.0	0.50	1		11/09/16 20:03	16887-00-6	
Fluoride	**0.87**	mg/L	0.20	0.027	1		11/09/16 20:03	16984-48-8	
Sulfate	**780**	mg/L	100	15.4	100		11/10/16 14:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: MW 102M **Lab ID: 60231110004** Collected: 10/26/16 14:25 Received: 10/29/16 08:25 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	**1420**	ug/L	100	50.0	1	10/31/16 16:00	11/01/16 14:11	7440-42-8	
Calcium	**31.5**	mg/L	0.10	0.0081	1	10/31/16 16:00	11/01/16 14:11	7440-70-2	
Lithium	**75.4**	ug/L	10.0	4.9	1	10/31/16 16:00	11/01/16 14:11	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.51J**	ug/L	1.0	0.058	1	11/02/16 17:15	11/09/16 20:20	7440-36-0	
Arsenic	**0.90J**	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:20	7440-38-2	
Barium	**28.2**	ug/L	1.0	0.14	1	11/02/16 17:15	11/09/16 20:20	7440-39-3	
Beryllium	**0.37J**	ug/L	0.50	0.080	1	11/02/16 17:15	11/12/16 20:37	7440-41-7	
Cadmium	**0.11J**	ug/L	0.50	0.029	1	11/02/16 17:15	11/09/16 20:20	7440-43-9	
Chromium	**11.8**	ug/L	1.0	0.34	1	11/02/16 17:15	11/09/16 20:20	7440-47-3	
Cobalt	**2.4**	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:20	7440-48-4	
Lead	**1.7**	ug/L	1.0	0.19	1	11/02/16 17:15	11/09/16 20:20	7439-92-1	
Molybdenum	**11.7**	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:20	7439-98-7	
Selenium	**0.31J**	ug/L	1.0	0.18	1	11/02/16 17:15	11/10/16 12:29	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 12:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1420**	mg/L	5.0	5.0	1		11/01/16 11:01		
9040 pH	Analytical Method: EPA 9040								
pH	**7.8**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**13.0**	mg/L	1.0	0.50	1		11/09/16 20:17	16887-00-6	
Fluoride	**4.6**	mg/L	0.20	0.027	1		11/09/16 20:17	16984-48-8	
Sulfate	**384**	mg/L	50.0	7.7	50		11/10/16 14:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: MW 122M **Lab ID: 60231110005** Collected: 10/26/16 15:00 Received: 10/29/16 08:25 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	**4060**	ug/L	500	250	5	10/31/16 16:00	11/01/16 14:14	7440-42-8	
Calcium	**415**	mg/L	0.50	0.041	5	10/31/16 16:00	11/01/16 14:14	7440-70-2	
Lithium	**544**	ug/L	50.0	24.5	5	10/31/16 16:00	11/01/16 14:14	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.29J**	ug/L	3.0	0.18	3	11/02/16 17:15	11/12/16 20:45	7440-36-0	
Arsenic	ND	ug/L	5.0	0.52	5	11/02/16 17:15	11/12/16 20:50	7440-38-2	D3
Barium	**16.8**	ug/L	3.0	0.41	3	11/02/16 17:15	11/12/16 20:45	7440-39-3	
Beryllium	ND	ug/L	1.5	0.24	3	11/02/16 17:15	11/12/16 20:45	7440-41-7	D3
Cadmium	ND	ug/L	2.5	0.14	5	11/02/16 17:15	11/12/16 20:50	7440-43-9	D3
Chromium	**1.3J**	ug/L	3.0	1.0	3	11/02/16 17:15	11/12/16 20:45	7440-47-3	
Cobalt	**6.0**	ug/L	3.0	1.5	3	11/02/16 17:15	11/12/16 20:45	7440-48-4	
Lead	ND	ug/L	10.0	1.9	10	11/02/16 17:15	11/12/16 20:54	7439-92-1	D3
Molybdenum	**0.58J**	ug/L	5.0	0.52	5	11/02/16 17:15	11/12/16 20:50	7439-98-7	
Selenium	ND	ug/L	5.0	0.92	5	11/02/16 17:15	11/12/16 20:50	7782-49-2	D3
Thallium	ND	ug/L	10.0	5.0	10	11/02/16 17:15	11/12/16 20:54	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 12:08	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**13200**	mg/L	5.0	5.0	1		11/01/16 11:02		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.2**	mg/L	1.0	0.50	1		11/09/16 20:31	16887-00-6	
Fluoride	**0.48**	mg/L	0.20	0.027	1		11/09/16 20:31	16984-48-8	
Sulfate	**8600**	mg/L	1000	154	1000		11/10/16 15:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Sample: FIELD BLANK **Lab ID: 60231110006** Collected: 10/26/16 14:00 Received: 10/29/16 08:25 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	10/31/16 16:00	11/01/16 14:18	7440-42-8	
Calcium	ND	mg/L	0.10	0.0081	1	10/31/16 16:00	11/01/16 14:18	7440-70-2	
Lithium	ND	ug/L	10.0	4.9	1	10/31/16 16:00	11/01/16 14:18	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.058	1	11/02/16 17:15	11/09/16 20:03	7440-36-0	
Arsenic	ND	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:03	7440-38-2	
Barium	**0.18J**	ug/L	1.0	0.14	1	11/02/16 17:15	11/09/16 20:03	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	11/02/16 17:15	11/12/16 20:41	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	11/02/16 17:15	11/09/16 20:03	7440-43-9	
Chromium	**0.52J**	ug/L	1.0	0.34	1	11/02/16 17:15	11/09/16 20:03	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:03	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	11/02/16 17:15	11/09/16 20:03	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.10	1	11/02/16 17:15	11/09/16 20:03	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	11/02/16 17:15	11/10/16 12:19	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	11/02/16 17:15	11/09/16 20:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.039	1	11/04/16 16:30	11/07/16 12:10	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		11/01/16 11:02		
9040 pH	Analytical Method: EPA 9040								
pH	**5.7**	Std. Units	0.10	0.10	1		11/07/16 14:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		11/10/16 08:06	16887-00-6	
Fluoride	ND	mg/L	0.20	0.027	1		11/10/16 08:06	16984-48-8	
Sulfate	ND	mg/L	1.0	0.15	1		11/10/16 08:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 453535 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

METHOD BLANK: 1856607 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.039	11/07/16 11:09	

LABORATORY CONTROL SAMPLE: 1856608

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1856609 1856610

Parameter	Units	60231109003 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	3.6	3.5	73	70	75-125	3	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 452765 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

METHOD BLANK: 1853549 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	50.0	11/01/16 13:08	
Calcium	mg/L	ND	0.10	0.0081	11/01/16 13:08	
Lithium	ug/L	ND	10.0	4.9	11/01/16 13:08	

LABORATORY CONTROL SAMPLE: 1853550

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	968	97	80-120	
Calcium	mg/L	10	10.2	102	80-120	
Lithium	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1853551 1853552

Parameter	Units	60230940001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	1000	1000	1010	1000	98	98	75-125	0	20	
Calcium	mg/L	4800 ug/L	10	10	15.0	15.1	102	103	75-125	0	20	
Lithium	ug/L	ND	1000	1000	1020	1030	102	102	75-125	0	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 452771 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60231110001, 60231110002

METHOD BLANK: 1853571 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.058	11/10/16 01:40	
Arsenic	ug/L	ND	1.0	0.10	11/11/16 11:13	
Barium	ug/L	0.43J	1.0	0.14	11/10/16 01:40	
Beryllium	ug/L	ND	0.50	0.080	11/11/16 11:13	
Cadmium	ug/L	ND	0.50	0.029	11/10/16 01:40	
Chromium	ug/L	ND	1.0	0.34	11/10/16 01:40	
Cobalt	ug/L	ND	1.0	0.50	11/10/16 01:40	
Lead	ug/L	ND	1.0	0.19	11/10/16 01:40	
Molybdenum	ug/L	ND	1.0	0.10	11/10/16 01:40	
Selenium	ug/L	ND	1.0	0.18	11/11/16 11:13	
Thallium	ug/L	ND	1.0	0.50	11/10/16 01:40	

LABORATORY CONTROL SAMPLE: 1853572

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.6	99	80-120	
Arsenic	ug/L	40	39.7	99	80-120	
Barium	ug/L	40	40.0	100	80-120	
Beryllium	ug/L	40	39.8	100	80-120	
Cadmium	ug/L	40	39.4	98	80-120	
Chromium	ug/L	40	39.6	99	80-120	
Cobalt	ug/L	40	39.2	98	80-120	
Lead	ug/L	40	39.3	98	80-120	
Molybdenum	ug/L	40	41.3	103	80-120	
Selenium	ug/L	40	38.2	96	80-120	
Thallium	ug/L	40	38.2	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1853573 1853574

Parameter	Units	60231104008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.079J	40	40	40.0	39.9	100	100	75-125	0	20	
Arsenic	ug/L	83.1	40	40	125	123	104	99	75-125	2	20	
Barium	ug/L	352	40	40	400	391	121	98	75-125	2	20	
Beryllium	ug/L	ND	40	40	38.7	37.5	97	94	75-125	3	20	
Cadmium	ug/L	ND	40	40	38.6	38.4	96	96	75-125	1	20	
Chromium	ug/L	0.98J	40	40	40.8	40.4	100	99	75-125	1	20	
Cobalt	ug/L	ND	40	40	39.2	38.8	97	96	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1853573 1853574

Parameter	Units	60231104008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	40.5	40.5	101	101	75-125	0	20	
Molybdenum	ug/L	1.4	40	40	44.4	43.6	107	106	75-125	2	20	
Selenium	ug/L	0.19J	40	40	37.6	36.8	93	92	75-125	2	20	
Thallium	ug/L	ND	40	40	39.8	39.4	99	99	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 453169 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60231110003, 60231110004, 60231110005, 60231110006

METHOD BLANK: 1854964 Matrix: Water
Associated Lab Samples: 60231110003, 60231110004, 60231110005, 60231110006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.058	11/09/16 19:55	
Arsenic	ug/L	ND	1.0	0.10	11/09/16 19:55	
Barium	ug/L	ND	1.0	0.14	11/09/16 19:55	
Beryllium	ug/L	ND	0.50	0.080	11/12/16 20:15	
Cadmium	ug/L	ND	0.50	0.029	11/09/16 19:55	
Chromium	ug/L	ND	1.0	0.34	11/09/16 19:55	
Cobalt	ug/L	ND	1.0	0.50	11/09/16 19:55	
Lead	ug/L	ND	1.0	0.19	11/09/16 19:55	
Molybdenum	ug/L	ND	1.0	0.10	11/09/16 19:55	
Selenium	ug/L	ND	1.0	0.18	11/10/16 12:11	
Thallium	ug/L	ND	1.0	0.50	11/09/16 19:55	

LABORATORY CONTROL SAMPLE: 1854965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.2	103	80-120	
Arsenic	ug/L	40	39.5	99	80-120	
Barium	ug/L	40	41.1	103	80-120	
Beryllium	ug/L	40	40.4	101	80-120	
Cadmium	ug/L	40	40.2	100	80-120	
Chromium	ug/L	40	41.0	102	80-120	
Cobalt	ug/L	40	40.4	101	80-120	
Lead	ug/L	40	40.8	102	80-120	
Molybdenum	ug/L	40	43.0	107	80-120	
Selenium	ug/L	40	40.1	100	80-120	
Thallium	ug/L	40	39.0	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854966 1854967

Parameter	Units	60231110003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	38.7	38.5	97	96	75-125	0	20	
Arsenic	ug/L	0.13J	40	40	39.2	38.1	98	95	75-125	3	20	
Barium	ug/L	13.4	40	40	54.4	54.2	103	102	75-125	0	20	
Beryllium	ug/L	0.11J	40	40	32.8	32.1	82	80	75-125	2	20	
Cadmium	ug/L	0.037J	40	40	37.3	37.5	93	94	75-125	0	20	
Chromium	ug/L	2.6	40	40	43.3	43.3	102	102	75-125	0	20	
Cobalt	ug/L	1.0	40	40	39.5	39.5	96	96	75-125	0	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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854966 1854967

Parameter	Units	60231110003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.57J	40	40	42.8	43.0	106	106	75-125	0	20	
Molybdenum	ug/L	0.43J	40	40	42.7	42.2	106	104	75-125	1	20	
Selenium	ug/L	ND	40	40	35.4	36.0	88	90	75-125	2	20	
Thallium	ug/L	ND	40	40	40.8	40.9	102	102	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 452910 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

METHOD BLANK: 1853994 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	11/01/16 10:49	

LABORATORY CONTROL SAMPLE: 1853995

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1090	109	80-120	

SAMPLE DUPLICATE: 1853996

Parameter	Units	60231107002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	783	799	2	10	

SAMPLE DUPLICATE: 1853997

Parameter	Units	60231110003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1500	1440	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 453716 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

SAMPLE DUPLICATE: 1857878

Parameter	Units	60231110002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.4	7.4	1	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 454107 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005

METHOD BLANK: 1859354 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	11/09/16 14:22	
Fluoride	mg/L	ND	0.20	0.027	11/09/16 14:22	

LABORATORY CONTROL SAMPLE: 1859355

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859356 1859357

Parameter	Units	60231107001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.8	5	5	12.5	12.7	115	119	80-120	2	15	
Fluoride	mg/L	0.12J	2.5	2.5	3.0	3.2	116	121	80-120	4	15	M1

SAMPLE DUPLICATE: 1859358

Parameter	Units	60231107002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.8	1.7	0	15	
Fluoride	mg/L	0.45	0.45	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

QC Batch: 454221 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

METHOD BLANK: 1859893 Matrix: Water
Associated Lab Samples: 60231110001, 60231110002, 60231110003, 60231110004, 60231110005, 60231110006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	11/10/16 07:10	
Fluoride	mg/L	ND	0.20	0.027	11/10/16 07:10	
Sulfate	mg/L	ND	1.0	0.15	11/10/16 07:10	

LABORATORY CONTROL SAMPLE: 1859894

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	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859895 1859896

Parameter	Units	60231107001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.8			17.2	17.3				0	15	
Fluoride	mg/L	0.12J			5.7	5.7				1	15	
Sulfate	mg/L	25.2	10	10	36.6	36.6	114	114	80-120	0	15	

SAMPLE DUPLICATE: 1859897

Parameter	Units	60231107002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.8	ND			
Fluoride	mg/L	0.45	ND			
Sulfate	mg/L	545	326	50	15	D6

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

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

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231110

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231110001	**MW 301**	EPA 3010	452765	EPA 6010	452837
60231110002	**MW 302**	EPA 3010	452765	EPA 6010	452837
60231110003	**MW 303**	EPA 3010	452765	EPA 6010	452837
60231110004	**MW 102M**	EPA 3010	452765	EPA 6010	452837
60231110005	**MW 122M**	EPA 3010	452765	EPA 6010	452837
60231110006	**FIELD BLANK**	EPA 3010	452765	EPA 6010	452837
60231110001	**MW 301**	EPA 3010	452771	EPA 6020	452847
60231110002	**MW 302**	EPA 3010	452771	EPA 6020	452847
60231110003	**MW 303**	EPA 3010	453169	EPA 6020	453227
60231110004	**MW 102M**	EPA 3010	453169	EPA 6020	453227
60231110005	**MW 122M**	EPA 3010	453169	EPA 6020	453227
60231110006	**FIELD BLANK**	EPA 3010	453169	EPA 6020	453227
60231110001	**MW 301**	EPA 7470	453535	EPA 7470	453628
60231110002	**MW 302**	EPA 7470	453535	EPA 7470	453628
60231110003	**MW 303**	EPA 7470	453535	EPA 7470	453628
60231110004	**MW 102M**	EPA 7470	453535	EPA 7470	453628
60231110005	**MW 122M**	EPA 7470	453535	EPA 7470	453628
60231110006	**FIELD BLANK**	EPA 7470	453535	EPA 7470	453628
60231110001	**MW 301**	SM 2540C	452910		
60231110002	**MW 302**	SM 2540C	452910		
60231110003	**MW 303**	SM 2540C	452910		
60231110004	**MW 102M**	SM 2540C	452910		
60231110005	**MW 122M**	SM 2540C	452910		
60231110006	**FIELD BLANK**	SM 2540C	452910		
60231110001	**MW 301**	EPA 9040	453716		
60231110002	**MW 302**	EPA 9040	453716		
60231110003	**MW 303**	EPA 9040	453716		
60231110004	**MW 102M**	EPA 9040	453716		
60231110005	**MW 122M**	EPA 9040	453716		
60231110006	**FIELD BLANK**	EPA 9040	453716		
60231110001	**MW 301**	EPA 9056	454107		
60231110001	**MW 301**	EPA 9056	454221		
60231110002	**MW 302**	EPA 9056	454107		
60231110002	**MW 302**	EPA 9056	454221		
60231110003	**MW 303**	EPA 9056	454107		
60231110003	**MW 303**	EPA 9056	454221		
60231110004	**MW 102M**	EPA 9056	454107		
60231110004	**MW 102M**	EPA 9056	454221		
60231110005	**MW 122M**	EPA 9056	454107		
60231110005	**MW 122M**	EPA 9056	454221		
60231110006	**FIELD BLANK**	EPA 9056	454221		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60231110

60231110

Client Name: SCS

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

Tracking #: 7944 9338 3336 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 +0.7) T-266 / (CF -0.5) T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.9 **Corr. Factor** (CF +0.7) (CF -0.5) **Corrected** 2.6

Date and initials of person examining contents: JB 10/29

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: JVL Date: 10-31-16

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UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Page 1 of

CHAIN OF CUSTODY

6023110

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison, WI
Project Contact:	Meg Blodgett
Phone:	(608) 216-7362
Project Number:	25216073
Project Name:	Ottumwa Midland Landfill
Project State:	IA.
Sampled By (Print):	Paul A. Grover
Sampled By (Sign):	Paul A. Grover
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	
Mail To Company:	
Mail To Address:	
Invoice To Contact:	
Invoice To Company:	
Invoice To Address:	
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air; B = Biota; C = Charcoal; O = Oil; S = Soil; SL = Sludge; W = Water; DW = Drinking Water; GW = Ground Water; SW = Surface Water; WW = Waste Water; WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO)	PRESERVATION (CODE)*	Analyses Requested: Total Metals 6010 B, Ca, Li	Total Metals 6020 Total Metals	Total Hg 7470 Total Hg	Cl, Florida, Sulfate 9056	TDS 2540C	Ph 9040	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	MW 301	10/26/16	13:45	GW	No	D	D	D	A	A	A		BP2N	BP2N2O	01
	MW 302		10:15												02
	MW 303		12:00												03
	MW 102 M		14:25												04
	MW 122 M		15:00												05
	Field Blank		14:00	DI											06

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Paul A. Grover SCS	10/26/16, 14:30	JE	10/27 0825

PACE Project No.

Receipt Temp = 2.6 °C

Sample Receipt pH OK / Adjusted

Cooler Custody Seal Present / Not Present (Intact) / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Page 2 of 24

Pace Analytical Services, LLC
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November 28, 2016

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2016. 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
trudy.gipson@pacelabs.com
Project Manager

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60231119001	**MW-301**	Water	10/26/16 13:45	10/29/16 08:25
60231119002	**MW-302**	Water	10/26/16 10:15	10/29/16 08:25
60231119003	**MW-303**	Water	10/26/16 12:00	10/29/16 08:25
60231119004	**MW-102M**	Water	10/26/16 14:25	10/29/16 08:25
60231119005	**MW-122M**	Water	10/26/16 15:00	10/29/16 08:25
60231119006	**FIELD BLANK**	Water	10/26/16 14:00	10/29/16 08:25

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231119001	**MW-301**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60231119002	**MW-302**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60231119003	**MW-303**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60231119004	**MW-102M**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60231119005	**MW-122M**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60231119006	**FIELD BLANK**	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: MW-301 **Lab ID: 60231119001** Collected: 10/26/16 13:45 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.660 ± 0.544 (0.787) C:NA T:91%**	pCi/L	11/23/16 20:35	13982-63-3	
Radium-228	EPA 904.0	**1.02 ± 0.460 (0.779) C:75% T:86%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.68 ± 1.00 (1.57)**	pCi/L	11/28/16 16:40	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: MW-302 **Lab ID: 60231119002** Collected: 10/26/16 10:15 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.505 ± 0.355 (0.171) C:NA T:89%**	pCi/L	11/23/16 20:35	13982-63-3	
Radium-228	EPA 904.0	**0.663 ± 0.443 (0.852) C:76% T:78%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.17 ± 0.798 (1.02)**	pCi/L	11/28/16 16:40	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: MW-303 **Lab ID: 60231119003** Collected: 10/26/16 12:00 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.634 ± 0.414 (0.424) C:NA T:95%**	pCi/L	11/23/16 20:36	13982-63-3	
Radium-228	EPA 904.0	**1.55 ± 0.539 (0.765) C:70% T:87%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**2.18 ± 0.953 (1.19)**	pCi/L	11/28/16 16:40	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: MW-102M **Lab ID: 60231119004** Collected: 10/26/16 14:25 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.444 ± 0.376 (0.466) C:NA T:88%**	pCi/L	11/23/16 20:36	13982-63-3	
Radium-228	EPA 904.0	**0.370 ± 0.414 (0.868) C:68% T:80%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**0.814 ± 0.790 (1.33)**	pCi/L	11/28/16 16:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: MW-122M **Lab ID: 60231119005** Collected: 10/26/16 15:00 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.392 ± 0.333 (0.412) C:NA T:94%**	pCi/L	11/23/16 20:37	13982-63-3	
Radium-228	EPA 904.0	**1.44 ± 0.720 (1.28) C:71% T:78%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.83 ± 1.05 (1.69)**	pCi/L	11/28/16 16:40	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Sample: FIELD BLANK **Lab ID: 60231119006** Collected: 10/26/16 14:00 Received: 10/29/16 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.134 ± 0.371 (0.876) C:NA T:86%**	pCi/L	11/23/16 20:58	13982-63-3	
Radium-228	EPA 904.0	**1.55 ± 0.511 (0.682) C:79% T:84%**	pCi/L	11/27/16 13:07	15262-20-1	
Total Radium	Total Radium Calculation	**1.55 ± 0.882 (1.56)**	pCi/L	11/28/16 16:40	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

QC Batch: 240364 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60231119001, 60231119002, 60231119003, 60231119004, 60231119005, 60231119006

METHOD BLANK: 1181263 Matrix: Water
Associated Lab Samples: 60231119001, 60231119002, 60231119003, 60231119004, 60231119005, 60231119006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.265 ± 0.410 (0.887) C:75% T:73%	pCi/L	11/27/16 13:06	

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 Midland LF/25216073
Pace Project No.: 60231119

QC Batch: 240362 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60231119001, 60231119002, 60231119003, 60231119004, 60231119005, 60231119006

METHOD BLANK: 1181256 Matrix: Water
Associated Lab Samples: 60231119001, 60231119002, 60231119003, 60231119004, 60231119005, 60231119006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.196 ± 0.340 (0.607) C:NA T:92%	pCi/L	11/23/16 20:09	

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 Midland LF/25216073
Pace Project No.: 60231119

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60231119

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231119001	**MW-301**	EPA 903.1	240362		
60231119002	**MW-302**	EPA 903.1	240362		
60231119003	**MW-303**	EPA 903.1	240362		
60231119004	**MW-102M**	EPA 903.1	240362		
60231119005	**MW-122M**	EPA 903.1	240362		
60231119006	**FIELD BLANK**	EPA 903.1	240362		
60231119001	**MW-301**	EPA 904.0	240364		
60231119002	**MW-302**	EPA 904.0	240364		
60231119003	**MW-303**	EPA 904.0	240364		
60231119004	**MW-102M**	EPA 904.0	240364		
60231119005	**MW-122M**	EPA 904.0	240364		
60231119006	**FIELD BLANK**	EPA 904.0	240364		
60231119001	**MW-301**	Total Radium Calculation	241514		
60231119002	**MW-302**	Total Radium Calculation	241514		
60231119003	**MW-303**	Total Radium Calculation	241514		
60231119004	**MW-102M**	Total Radium Calculation	241514		
60231119005	**MW-122M**	Total Radium Calculation	241514		
60231119006	**FIELD BLANK**	Total Radium Calculation	241514		

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Sample Condition Upon Receipt

WO# : 60231119

60231119

Client Name: SCS

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

Tracking #: 7844 9338 9336 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 +0.7 T-266 / CF -0.5 T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 2.1 **Corr. Factor** CF +0.7 CF -0.5 **Corrected** 2.8

Date and initials of person examining contents: JD 10/29

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: 10.31.16

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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	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216073	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ 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	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	10/26/16	13:45	13.5	2			2							X	X	X		(2) BPLN 70
2	MW-302	WT	G	xxx	xxx		10:15	13.5	2			2							X	X	X		
3	MW-303	WT	G	xxx	xxx		12:00	13.1	2			2							X	X	X		
4	MW-102M	WT	G	xxx	xxx		14:25	—	2			2							X	X	X		
5	MW-122M	WT	G	xxx	xxx		15:00	—	2			2							X	X	X		
6	FIELD BLANK	WT	G	xxx	xxx	↓	14:00	—	2			2							X	X	X		
7																							
8																							
9																							
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

6023119

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Lorson SCS	10/28/16	19:30		10/29	1825	2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
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.

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

Chain of Custody

WO#:30201160

30201160

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www.pacelabs.com

Workorder: 60231119 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 10/29/2016 **Results Requested By:** 11/22/2016

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 HNO3						Requested Analysis 903.1 Radium-226	904.0 Radium-228	Total Radium									LAB USE ONLY
1	MW-301	PS	10/26/2016 13:45	60231119001	Water	2						X	X	X									001
2	MW-302	PS	10/26/2016 10:15	60231119002	Water	2						X	X	X									002
3	MW-303	PS	10/26/2016 12:00	60231119003	Water	2						X	X	X									003
4	MW-102M	PS	10/26/2016 14:25	60231119004	Water	2						X	X	X									004
5	MW-122M	PS	10/26/2016 15:00	60231119005	Water	2						X	X	X									005
6	FIELD BLANK	PS	10/26/2016 14:00	60231119006	Water	2						X	X	X									006

Transfers	Released By	Date/Time	Received	Date/Time
1		10/31/16 1700		11-1-16 1000
2				
3				

Comments

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.*

Sample Condition Upon Receipt Pittsburgh

Pace Analytical

Client Name: Pace KS Project # 30201160

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: _____

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: ML 11-1-16

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

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

February 02, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60236559001	**MW-301**	Water	01/17/17 16:15	01/24/17 08:40
60236559002	**MW-302**	Water	01/17/17 14:15	01/24/17 08:40
60236559003	**MW-303**	Water	01/17/17 15:30	01/24/17 08:40
60236559004	**MW-102M**	Water	01/18/17 08:30	01/24/17 08:40
60236559005	**MW-122M**	Water	01/18/17 10:15	01/24/17 08:40
60236559006	**FIELD BLANK**	Water	01/17/17 16:30	01/24/17 08:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60236559001	**MW-301**	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236559002	**MW-302**	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236559003	**MW-303**	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	AGO	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60236559004	**MW-102M**	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
60236559005	**MW-122M**	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
60236559006	**FIELD BLANK**	EPA 6010	ZBM	3	PASI-K
		EPA 6020	SMW	11	PASI-K
		EPA 7470	ZBM	1	PASI-K
		SM 2540C	AGO, JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: MW-301 **Lab ID: 60236559001** Collected: 01/17/17 16:15 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 10:08		
Field pH	**6.31**	Std. Units	0.10	0.050	1		02/01/17 10:08		
Field Temperature	**13.1**	deg C	0.50	0.25	1		02/01/17 10:08		
Field Specific Conductance	**3607**	umhos/cm	1.0	1.0	1		02/01/17 10:08		
Oxygen, Dissolved	**0.19**	mg/L			1		02/01/17 10:08	7782-44-7	
REDOX	**-57.8**	mV			1		02/01/17 10:08		
Turbidity	**0.63**	NTU	1.0	1.0	1		02/01/17 10:08		
Groundwater Elevation	**685.57**	feet			1		02/01/17 10:08		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1310**	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 13:01	7440-42-8	
Calcium	**337**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:01	7440-70-2	
Lithium	**156**	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:01	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.089J**	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:56	7440-36-0	B
Arsenic	**0.64J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:56	7440-38-2	
Barium	**41.5**	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:56	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:56	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:56	7440-43-9	
Chromium	**0.50J**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:56	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:56	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:56	7439-92-1	
Molybdenum	**2.9**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:56	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:56	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:56	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 14:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**2830**	mg/L	5.0	5.0	1		01/24/17 15:42		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		02/01/17 12:36		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**32.6**	mg/L	2.0	1.0	2		01/31/17 20:15	16887-00-6	
Fluoride	**0.77**	mg/L	0.20	0.027	1		01/29/17 14:17	16984-48-8	
Sulfate	**1780**	mg/L	200	30.9	200		01/31/17 21:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: MW-302 **Lab ID: 60236559002** Collected: 01/17/17 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 10:09		
Field pH	**7.23**	Std. Units	0.10	0.050	1		02/01/17 10:09		
Field Temperature	**12.9**	deg C	0.50	0.25	1		02/01/17 10:09		
Field Specific Conductance	**1081**	umhos/cm	1.0	1.0	1		02/01/17 10:09		
Oxygen, Dissolved	**0.29**	mg/L			1		02/01/17 10:09	7782-44-7	
REDOX	**-109.6**	mV			1		02/01/17 10:09		
Turbidity	**43.07**	NTU	1.0	1.0	1		02/01/17 10:09		
Groundwater Elevation	**685.68**	feet			1		02/01/17 10:09		
6010 MET ICP	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Boron	**824**	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 13:03	7440-42-8	
Calcium	**42.9**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:03	7440-70-2	
Lithium	**80.8**	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:03	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 15:00	7440-36-0	B
Arsenic	**0.31J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 15:00	7440-38-2	
Barium	**57.2**	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 15:00	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 15:00	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 15:00	7440-43-9	
Chromium	**1.4**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 15:00	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 15:00	7440-48-4	
Lead	**0.26J**	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 15:00	7439-92-1	
Molybdenum	**0.24J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 15:00	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 15:00	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 15:00	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 14:57	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**639**	mg/L	5.0	5.0	1		01/24/17 15:42		
9040 pH	Analytical Method: EPA 9040								
pH	**7.6**	Std. Units	0.10	0.10	1		02/01/17 12:33		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.7**	mg/L	1.0	0.50	1		01/29/17 14:31	16887-00-6	
Fluoride	**0.97**	mg/L	0.20	0.027	1		01/29/17 14:31	16984-48-8	
Sulfate	**76.7**	mg/L	10.0	1.5	10		01/31/17 21:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: MW-303 **Lab ID: 60236559003** Collected: 01/17/17 15:30 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 10:09		
Field pH	**6.69**	Std. Units	0.10	0.050	1		02/01/17 10:09		
Field Temperature	**13.0**	deg C	0.50	0.25	1		02/01/17 10:09		
Field Specific Conductance	**1681**	umhos/cm	1.0	1.0	1		02/01/17 10:09		
Oxygen, Dissolved	**0.16**	mg/L			1		02/01/17 10:09	7782-44-7	
REDOX	**-93.5**	mV			1		02/01/17 10:09		
Turbidity	**113.7**	NTU	1.0	1.0	1		02/01/17 10:09		
Groundwater Elevation	**685.60**	feet			1		02/01/17 10:09		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**955**	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 13:06	7440-42-8	
Calcium	**116**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:06	7440-70-2	
Lithium	**96.5**	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:06	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.082J**	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 15:05	7440-36-0	B
Arsenic	**0.20J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 15:05	7440-38-2	
Barium	**11.7**	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 15:05	7440-39-3	
Beryllium	**0.099J**	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 15:05	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 15:05	7440-43-9	
Chromium	**1.1**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 15:05	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 15:05	7440-48-4	
Lead	**0.30J**	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 15:05	7439-92-1	
Molybdenum	**0.29J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 15:05	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 15:05	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 15:05	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 14:59	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1080**	mg/L	5.0	5.0	1		01/24/17 15:42		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		02/01/17 12:35		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.1**	mg/L	1.0	0.50	1		01/29/17 15:12	16887-00-6	
Fluoride	**0.86**	mg/L	0.20	0.027	1		01/29/17 15:12	16984-48-8	
Sulfate	**497**	mg/L	50.0	7.7	50		01/31/17 21:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: MW-102M **Lab ID: 60236559004** Collected: 01/18/17 08:30 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 10:09		
Field pH	**7.62**	Std. Units	0.10	0.050	1		02/01/17 10:09		
Groundwater Elevation	**717.91**	feet			1		02/01/17 10:09		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1480**	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 13:08	7440-42-8	
Calcium	**23.6**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:08	7440-70-2	
Lithium	**71.8**	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:08	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.26J**	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:47	7440-36-0	B
Arsenic	**0.89J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:47	7440-38-2	
Barium	**21.1**	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:47	7440-39-3	
Beryllium	**0.19J**	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:47	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:47	7440-43-9	
Chromium	**2.8**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:47	7440-47-3	
Cobalt	**0.74J**	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:47	7440-48-4	
Lead	**0.87J**	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:47	7439-92-1	
Molybdenum	**10.6**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:47	7439-98-7	
Selenium	**0.24J**	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:47	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:47	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 15:01	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1530**	mg/L	5.0	5.0	1		01/25/17 15:09		
9040 pH	Analytical Method: EPA 9040								
pH	**8.1**	Std. Units	0.10	0.10	1		02/01/17 12:39		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**12.3**	mg/L	1.0	0.50	1		01/29/17 15:26	16887-00-6	
Fluoride	**4.1**	mg/L	0.20	0.027	1		01/29/17 15:26	16984-48-8	
Sulfate	**415**	mg/L	50.0	7.7	50		01/31/17 21:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: MW-122M **Lab ID: 60236559005** Collected: 01/18/17 10:15 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 10:10		
Field pH	**6.06**	Std. Units	0.10	0.050	1		02/01/17 10:10		
Groundwater Elevation	**742.02**	feet			1		02/01/17 10:10		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**4720**	ug/L	100	50.0	1	01/25/17 09:15	01/26/17 13:10	7440-42-8	
Calcium	**386**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:10	7440-70-2	
Lithium	**679**	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:10	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.12J**	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:52	7440-36-0	B
Arsenic	**0.11J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:52	7440-38-2	
Barium	**11.8**	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:52	7440-39-3	
Beryllium	ND	ug/L	2.5	0.40	5	01/25/17 09:15	01/30/17 16:29	7440-41-7	D3
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:52	7440-43-9	
Chromium	**0.51J**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:52	7440-47-3	
Cobalt	**2.1**	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:52	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:52	7439-92-1	
Molybdenum	**0.15J**	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:52	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:52	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:52	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 15:03	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**14100**	mg/L	5.0	5.0	1		01/25/17 15:10		
9040 pH	Analytical Method: EPA 9040								
pH	**6.1**	Std. Units	0.10	0.10	1		02/01/17 12:40		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.3**	mg/L	1.0	0.50	1		01/29/17 15:39	16887-00-6	
Fluoride	ND	mg/L	0.20	0.027	1		01/29/17 15:39	16984-48-8	
Sulfate	**9680**	mg/L	500	77.2	500		01/31/17 22:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Sample: FIELD BLANK **Lab ID: 60236559006** Collected: 01/17/17 16:30 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 13:13	7440-42-8	
Calcium	**0.056J**	mg/L	0.10	0.0081	1	01/25/17 09:15	01/26/17 13:13	7440-70-2	B
Lithium	ND	ug/L	10.0	4.9	1	01/25/17 09:15	01/26/17 13:13	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.084J**	ug/L	1.0	0.058	1	01/25/17 09:15	01/30/17 14:30	7440-36-0	B
Arsenic	ND	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:30	7440-38-2	
Barium	ND	ug/L	1.0	0.14	1	01/25/17 09:15	01/30/17 14:30	7440-39-3	
Beryllium	ND	ug/L	0.50	0.080	1	01/25/17 09:15	01/30/17 14:30	7440-41-7	
Cadmium	ND	ug/L	0.50	0.029	1	01/25/17 09:15	01/30/17 14:30	7440-43-9	
Chromium	**0.44J**	ug/L	1.0	0.34	1	01/25/17 09:15	01/30/17 14:30	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:30	7440-48-4	
Lead	ND	ug/L	1.0	0.19	1	01/25/17 09:15	01/30/17 14:30	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.10	1	01/25/17 09:15	01/30/17 14:30	7439-98-7	
Selenium	ND	ug/L	1.0	0.18	1	01/25/17 09:15	01/30/17 14:30	7782-49-2	
Thallium	ND	ug/L	1.0	0.50	1	01/25/17 09:15	01/30/17 14:30	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 15:06	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	20.0	20.0	4		01/24/17 15:43		
Total Dissolved Solids	**5.0**	mg/L	5.0	5.0	1		01/26/17 09:01		H1
9040 pH	Analytical Method: EPA 9040								
pH	**5.7**	Std. Units	0.10	0.10	1		02/01/17 12:38		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		01/31/17 22:18	16887-00-6	
Fluoride	ND	mg/L	0.20	0.027	1		01/31/17 22:18	16984-48-8	
Sulfate	ND	mg/L	1.0	0.15	1		01/31/17 22:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463894 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

METHOD BLANK: 1898803 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463142 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

METHOD BLANK: 1896141 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463143 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

METHOD BLANK: 1896145 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

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	60236558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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	
Cobalt	ug/L	1.3	40	40	39.6	39.7	96	96	75-125	0	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1896147 1896148

Parameter	Units	60236558001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463087 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559006

METHOD BLANK: 1895932 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	01/24/17 15:40	

LABORATORY CONTROL SAMPLE: 1895933

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	962	96	80-120	

SAMPLE DUPLICATE: 1895934

Parameter	Units	60236203003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	968	971	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463213 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60236559004, 60236559005

METHOD BLANK: 1896349 Matrix: Water
Associated Lab Samples: 60236559004, 60236559005

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	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463313 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60236559006

METHOD BLANK: 1896649 Matrix: Water
Associated Lab Samples: 60236559006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	01/26/17 08:59	

LABORATORY CONTROL SAMPLE: 1896650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	99	80-120	

SAMPLE DUPLICATE: 1896651

Parameter	Units	60236480005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	413	415	0	10	

SAMPLE DUPLICATE: 1896652

Parameter	Units	60236480009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	426	436	2	10	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 464025 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463615 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005

METHOD BLANK: 1898028 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	01/29/17 10:25	
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
Chloride	mg/L	5	4.9	99	80-120	
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 Midland LF/25216073
Pace Project No.: 60236559

QC Batch: 463899 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

METHOD BLANK: 1898811 Matrix: Water
Associated Lab Samples: 60236559001, 60236559002, 60236559003, 60236559004, 60236559005, 60236559006

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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 Midland LF/25216073
Pace Project No.: 60236559

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H1	Analysis conducted outside the EPA method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236559001	MW-301		464029		
60236559002	MW-302		464029		
60236559003	MW-303		464029		
60236559004	MW-102M		464029		
60236559005	MW-122M		464029		
60236559001	MW-301	EPA 3010	463142	EPA 6010	463178
60236559002	MW-302	EPA 3010	463142	EPA 6010	463178
60236559003	MW-303	EPA 3010	463142	EPA 6010	463178
60236559004	MW-102M	EPA 3010	463142	EPA 6010	463178
60236559005	MW-122M	EPA 3010	463142	EPA 6010	463178
60236559006	FIELD BLANK	EPA 3010	463142	EPA 6010	463178
60236559001	MW-301	EPA 3010	463143	EPA 6020	463177
60236559002	MW-302	EPA 3010	463143	EPA 6020	463177
60236559003	MW-303	EPA 3010	463143	EPA 6020	463177
60236559004	MW-102M	EPA 3010	463143	EPA 6020	463177
60236559005	MW-122M	EPA 3010	463143	EPA 6020	463177
60236559006	FIELD BLANK	EPA 3010	463143	EPA 6020	463177
60236559001	MW-301	EPA 7470	463894	EPA 7470	464001
60236559002	MW-302	EPA 7470	463894	EPA 7470	464001
60236559003	MW-303	EPA 7470	463894	EPA 7470	464001
60236559004	MW-102M	EPA 7470	463894	EPA 7470	464001
60236559005	MW-122M	EPA 7470	463894	EPA 7470	464001
60236559006	FIELD BLANK	EPA 7470	463894	EPA 7470	464001
60236559001	MW-301	SM 2540C	463087		
60236559002	MW-302	SM 2540C	463087		
60236559003	MW-303	SM 2540C	463087		
60236559004	MW-102M	SM 2540C	463213		
60236559005	MW-122M	SM 2540C	463213		
60236559006	FIELD BLANK	SM 2540C	463087		
60236559006	FIELD BLANK	SM 2540C	463313		
60236559001	MW-301	EPA 9040	464025		
60236559002	MW-302	EPA 9040	464025		
60236559003	MW-303	EPA 9040	464025		
60236559004	MW-102M	EPA 9040	464025		
60236559005	MW-122M	EPA 9040	464025		
60236559006	FIELD BLANK	EPA 9040	464025		
60236559001	MW-301	EPA 9056	463615		
60236559001	MW-301	EPA 9056	463899		
60236559002	MW-302	EPA 9056	463615		
60236559002	MW-302	EPA 9056	463899		
60236559003	MW-303	EPA 9056	463615		
60236559003	MW-303	EPA 9056	463899		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236559

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236559004	**MW-102M**	EPA 9056	463615		
60236559004	**MW-102M**	EPA 9056	463899		
60236559005	**MW-122M**	EPA 9056	463615		
60236559005	**MW-122M**	EPA 9056	463899		
60236559006	**FIELD BLANK**	EPA 9056	463899		

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Sample Condition Upon Receipt

WO# : 60236559

60236559

Client Name: SCS Engr

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

Tracking #: 8102 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:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.3 **Corr. Factor** CF +1.5 / CF +0.9 **Corrected** 1.8

Date and initials of person examining contents: JB 1/24

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: 1-24-17

CHAIN-OF-CUSTODY / Analytical Request Document

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

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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:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): 6010 N, 6020 N, 7470 N

Pace Project No./ Lab I.D.: 60236559

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	1-17-17	16:15	13.1	2	1		1						X	X	X	X	X	X		BP2U BP2N 01
2	MW-302	WT	G	xxx	xxx	↓	14:15	12.9	2	1		1						X	X	X	X	X	X		02
3	MW-303	WT	G	xxx	xxx	↓	15:30	13.0	2	1		1						X	X	X	X	X	X		03
4	MW-102M	WT	G	xxx	xxx	1-18-17	8:30	—	2	1		1						X	X	X	X	X	X		04
5	MW-122M	WT	G	xxx	xxx	↓	10:15	—	2	1		1						X	X	X	X	X	X		05
6	FIELD BLANK	WT	G	xxx	xxx	1-17-17	16:30	—	2	1		1						X	X	X	X	X	X		06
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Grover	1-23-17	16:30	[signature]	1/24	0840	1.8	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Paul A. Grover

SIGNATURE of SAMPLER: Paul A. Grover 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.

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

February 15, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

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
trudy.gipson@pacelabs.com
Project Manager

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60236562001	**MW-301**	Water	01/17/17 16:15	01/24/17 08:40
60236562002	**MW-302**	Water	01/17/17 14:15	01/24/17 08:40
60236562003	**MW-303**	Water	01/17/17 15:30	01/24/17 08:40
60236562004	**MW-102M**	Water	01/18/17 08:30	01/24/17 08:40
60236562005	**MW-122M**	Water	01/18/17 10:15	01/24/17 08:40
60236562006	**FIELD BLANK**	Water	01/17/17 16:30	01/24/17 08:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60236562001	**MW-301**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236562002	**MW-302**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236562003	**MW-303**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236562004	**MW-102M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236562005	**MW-122M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60236562006	**FIELD BLANK**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: MW-301 **Lab ID: 60236562001** Collected: 01/17/17 16:15 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	**0.440 ± 0.458 (0.681) C:NA T:85%**	pCi/L	02/14/17 20:21	13982-63-3	
Radium-228	EPA 904.0	**1.52 ± 0.930 (1.74) C:65% T:75%**	pCi/L	02/14/17 17:04	15262-20-1	
Total Radium	Total Radium Calculation	**1.96 ± 1.39 (2.42)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: MW-302 **Lab ID: 60236562002** Collected: 01/17/17 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	**0.525 ± 0.572 (0.900) C:NA T:84%**	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	**1.04 ± 0.593 (1.08) C:65% T:78%**	pCi/L	02/14/17 13:15	15262-20-1	
Total Radium	Total Radium Calculation	**1.57 ± 1.17 (1.98)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: MW-303 **Lab ID: 60236562003** Collected: 01/17/17 15:30 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	**0.199 ± 0.345 (0.617) C:NA T:93%**	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	**1.27 ± 0.689 (1.25) C:69% T:80%**	pCi/L	02/14/17 14:45	15262-20-1	
Total Radium	Total Radium Calculation	**1.47 ± 1.03 (1.87)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: MW-102M **Lab ID: 60236562004** Collected: 01/18/17 08:30 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	**0.209 ± 0.410 (0.750) C:NA T:93%**	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	**0.358 ± 0.561 (1.22) C:65% T:76%**	pCi/L	02/14/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	**0.567 ± 0.971 (1.97)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: MW-122M **Lab ID: 60236562005** Collected: 01/18/17 10:15 Received: 01/24/17 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 3 mls of nitric acid were added to the 1 sample bottle to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.320 ± 0.446 (0.744) C:NA T:78%**	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	**0.752 ± 0.526 (1.02) C:75% T:80%**	pCi/L	02/14/17 13:15	15262-20-1	
Total Radium	Total Radium Calculation	**1.07 ± 0.972 (1.76)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Sample: FIELD BLANK **Lab ID: 60236562006** Collected: 01/17/17 16:30 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	**-0.067 ± 0.305 (0.720) C:NA T:91%**	pCi/L	02/14/17 20:49	13982-63-3	
Radium-228	EPA 904.0	**0.300 ± 0.361 (0.762) C:105% T:75%**	pCi/L	02/14/17 14:14	15262-20-1	
Total Radium	Total Radium Calculation	**0.300 ± 0.666 (1.48)**	pCi/L	02/15/17 14:04	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

QC Batch: 248442 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60236562001, 60236562002, 60236562003, 60236562004, 60236562005, 60236562006

METHOD BLANK: 1222155 Matrix: Water
Associated Lab Samples: 60236562001, 60236562002, 60236562003, 60236562004, 60236562005, 60236562006

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

QC Batch: 248443 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60236562001, 60236562002, 60236562003, 60236562004, 60236562005, 60236562006

METHOD BLANK: 1222156 Matrix: Water
Associated Lab Samples: 60236562001, 60236562002, 60236562003, 60236562004, 60236562005, 60236562006

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.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

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

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60236562

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60236562001	**MW-301**	EPA 903.1	248442		
60236562002	**MW-302**	EPA 903.1	248442		
60236562003	**MW-303**	EPA 903.1	248442		
60236562004	**MW-102M**	EPA 903.1	248442		
60236562005	**MW-122M**	EPA 903.1	248442		
60236562006	**FIELD BLANK**	EPA 903.1	248442		
60236562001	**MW-301**	EPA 904.0	248443		
60236562002	**MW-302**	EPA 904.0	248443		
60236562003	**MW-303**	EPA 904.0	248443		
60236562004	**MW-102M**	EPA 904.0	248443		
60236562005	**MW-122M**	EPA 904.0	248443		
60236562006	**FIELD BLANK**	EPA 904.0	248443		
60236562001	**MW-301**	Total Radium Calculation	249404		
60236562002	**MW-302**	Total Radium Calculation	249404		
60236562003	**MW-303**	Total Radium Calculation	249404		
60236562004	**MW-102M**	Total Radium Calculation	249404		
60236562005	**MW-122M**	Total Radium Calculation	249404		
60236562006	**FIELD BLANK**	Total Radium Calculation	249404		

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Sample Condition Upon Receipt

WO# : 60236562

60236562

Client Name: SCS Eng.

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

Tracking #: 8102 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:** Wet Blue None

Cooler Temperature (°C): **As-read** 3.7 **Corr. Factor** CF +1.5 CF +0.9 **Corrected** 5.2/3.0

Date and initials of person examining contents: 955 JWS 1/24/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: water	☐Yes ☐No ☑N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☑N/A	
Cyanide water sample checks: ☑N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: JWS Date: 1-24-17

Pace Analytical
www.pacelabs.com

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	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216073	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ 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	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	1-17-17	16:15	13.1	2			2							X	X	X		60236562 (Y/N) 01
2	MW-302	WT	G	xxx	xxx	↓	14:15	12.9	2			2							X	X	X		02
3	MW-303	WT	G	xxx	xxx	↓	15:30	13.0	2			2							X	X	X		03
4	MW-102M	WT	G	xxx	xxx	1-18-17	9:30	—	2			2							X	X	X		04
5	MW-122M	WT	G	xxx	xxx	↓	10:15	—	2			2							X	X	X		05
6	FIELD BLANK	WT	G	xxx	xxx	1-17-17	16:30	—	2			2							X	X	X		06
7																							
8																							
9																							
10																							
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. Grover	1-23-17	16:30		1/24/17	0840	20	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Paul A. Grover

SIGNATURE of SAMPLER: Paul A. Grover DATE Signed (MM/DD/YY): 1-20-17

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*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

30208957

Pace Analytical
www.pacelabs.com

Workorder: 60236562 **Workorder Name:** Ottumwa Midland LF/25216073 **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

WO#:30208957

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3	Requested Analysis 903.1 Radium-226	904.0 Radium-228	Total Radium	LAB USE ONLY
1	MW-301	PS	1/17/2017 16:15	60236562001	Water	2	X	X	X	001
2	MW-302	PS	1/17/2017 14:15	60236562002	Water	2	X	X	X	002
3	MW-303	PS	1/17/2017 15:30	60236562003	Water	2	X	X	X	003
4	MW-102M	PS	1/18/2017 08:30	60236562004	Water	2	X	X	X	004
5	MW-122M	PS	1/18/2017 10:15	60236562005	Water	2	X	X	X	005
6	FIELD BLANK	PS	1/17/2017 16:30	60236562006	Water	2	X	X	X	006

Transfers	Released By	Date/Time	Received	Date/Time
1	[signature] (Pace)	1/24/17 1700	Alyssa R Muchoney Pace	1/25/17 1030
2				
3				

Comments

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

30208957

Pace Analytical

Client Name: PACE KS Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: 7044 0085 8870

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: -Includes date/time/ID Matrix: WT	✓			5.
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: -Pace Containers Used:	✓	✓		10.
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. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓	✓		15. Added 3mL HNO3 to 1 bottle from sample 006. PH<2 Initial when completed: ARM Date/time of preservation: 1/25/17 1850 Lot # of added preservative: DL17-0069
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: ARM Date: 1/25/17

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 Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 04, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

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

Enclosures

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60242501001	**MW-301**	Water	04/20/17 10:05	04/21/17 09:20
60242501002	**MW-302**	Water	04/19/17 15:00	04/21/17 09:20
60242501003	**MW-303**	Water	04/19/17 15:30	04/21/17 09:20
60242501004	**MW-102M**	Water	04/20/17 07:35	04/21/17 09:20
60242501005	**MW-122M**	Water	04/20/17 08:30	04/21/17 09:20
60242501006	**FIELD BLANK**	Water	04/20/17 09:35	04/21/17 09:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60242501001	**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
60242501002	**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
60242501003	**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
60242501004	**MW-102M**	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
60242501005	**MW-122M**	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
60242501006	**FIELD BLANK**	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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: MW-301 **Lab ID: 60242501001** Collected: 04/20/17 10:05 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 10:05		
Field pH	**6.15**	Std. Units	0.10	0.050	1		04/20/17 10:05		
Field Temperature	**13**	deg C	0.50	0.25	1		04/20/17 10:05		
Field Specific Conductance	**2631**	umhos/cm	1.0	1.0	1		04/20/17 10:05		
Field Oxidation Potential	**-49.8**	mV			1		04/20/17 10:05		
Oxygen, Dissolved	**0.18**	mg/L			1		04/20/17 10:05	7782-44-7	
Turbidity	**1.12**	NTU	1.0	1.0	1		04/20/17 10:05		
Groundwater Elevation	**685.72**	feet			1		04/20/17 10:05		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1040**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:26	7440-42-8	
Calcium	**224**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:26	7440-70-2	
Lithium	**110**	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:26	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 18:42	7440-36-0	
Arsenic	**0.56J**	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:42	7440-38-2	
Barium	**41.0**	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:42	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:42	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:42	7440-43-9	
Chromium	**0.31J**	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:42	7440-47-3	B
Cobalt	**0.21J**	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:42	7440-48-4	
Lead	**0.046J**	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:42	7439-92-1	
Molybdenum	**6.3**	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:42	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:42	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:42	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 12:16	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1990**	mg/L	5.0	5.0	1		04/25/17 15:01		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		05/01/17 14:40		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**58.0**	mg/L	5.0	2.5	5		04/27/17 08:13	16887-00-6	
Fluoride	**0.72**	mg/L	0.20	0.10	1		04/26/17 12:35	16984-48-8	
Sulfate	**1170**	mg/L	200	100	200		04/26/17 13:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: MW-302 **Lab ID: 60242501002** Collected: 04/19/17 15:00 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 15:00		
Field pH	**7.60**	Std. Units	0.10	0.050	1		04/19/17 15:00		
Field Temperature	**14.0**	deg C	0.50	0.25	1		04/19/17 15:00		
Field Specific Conductance	**1081**	umhos/cm	1.0	1.0	1		04/19/17 15:00		
Field Oxidation Potential	**-64.0**	mV			1		04/19/17 15:00		
Oxygen, Dissolved	**0.17**	mg/L			1		04/19/17 15:00	7782-44-7	
Turbidity	**39.01**	NTU	1.0	1.0	1		04/19/17 15:00		
Groundwater Elevation	**684.73**	feet			1		04/19/17 15:00		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**777**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:28	7440-42-8	
Calcium	**41.0**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:28	7440-70-2	
Lithium	**79.6**	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:28	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 18:50	7440-36-0	
Arsenic	**0.23J**	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:50	7440-38-2	
Barium	**48.9**	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:50	7440-39-3	
Beryllium	**0.051J**	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:50	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:50	7440-43-9	
Chromium	**1.4**	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:50	7440-47-3	B
Cobalt	**0.24J**	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:50	7440-48-4	
Lead	**0.25J**	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:50	7439-92-1	
Molybdenum	**0.20J**	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:50	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:50	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:50	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 12:18	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**671**	mg/L	5.0	5.0	1		04/24/17 12:52		
9040 pH	Analytical Method: EPA 9040								
pH	**7.5**	Std. Units	0.10	0.10	1		04/26/17 12:07		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.0**	mg/L	1.0	0.50	1		04/26/17 14:04	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.10	1		04/26/17 14:04	16984-48-8	
Sulfate	**76.7**	mg/L	10.0	5.0	10		04/26/17 13:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: MW-303 **Lab ID: 60242501003** Collected: 04/19/17 15:30 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 15:30		
Field pH	**7.12**	Std. Units	0.10	0.050	1		04/19/17 15:30		
Field Temperature	**13.7**	deg C	0.50	0.25	1		04/19/17 15:30		
Field Specific Conductance	**1451**	umhos/cm	1.0	1.0	1		04/19/17 15:30		
Field Oxidation Potential	**-56.6**	mV			1		04/19/17 15:30		
Oxygen, Dissolved	**0.17**	mg/L			1		04/19/17 15:30	7782-44-7	
Turbidity	**120.3**	NTU	1.0	1.0	1		04/19/17 15:30		
Groundwater Elevation	**685.51**	feet			1		04/19/17 15:30		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**800**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:30	7440-42-8	
Calcium	**97.4**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:30	7440-70-2	
Lithium	**92.4**	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:30	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 19:12	7440-36-0	
Arsenic	**0.24J**	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 19:12	7440-38-2	
Barium	**11.9**	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 19:12	7440-39-3	
Beryllium	**0.13J**	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 19:12	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 19:12	7440-43-9	
Chromium	**2.6**	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 19:12	7440-47-3	
Cobalt	**1.1**	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 19:12	7440-48-4	
Lead	**0.57J**	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 19:12	7439-92-1	
Molybdenum	**0.30J**	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 19:12	7439-98-7	
Selenium	**0.26J**	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 19:12	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 19:12	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 12:20	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**931**	mg/L	5.0	5.0	1		04/24/17 12:53		
9040 pH	Analytical Method: EPA 9040								
pH	**7.0**	Std. Units	0.10	0.10	1		04/26/17 12:08		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**6.9**	mg/L	1.0	0.50	1		04/26/17 14:18	16887-00-6	
Fluoride	**0.86**	mg/L	0.20	0.10	1		04/26/17 14:18	16984-48-8	
Sulfate	**329**	mg/L	50.0	25.0	50		04/26/17 14:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: MW-102M **Lab ID: 60242501004** Collected: 04/20/17 07:35 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 07:35		
Field pH	**7.35**	Std. Units	0.10	0.050	1		04/20/17 07:35		
Groundwater Elevation	**717.80**	feet			1		04/20/17 07:35		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1460**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:33	7440-42-8	
Calcium	**26.0**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:33	7440-70-2	
Lithium	**73.6**	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:33	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.10J**	ug/L	1.0	0.026	1	04/24/17 16:50	05/03/17 18:55	7440-36-0	
Arsenic	**0.92J**	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 18:55	7440-38-2	
Barium	**28.4**	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 18:55	7440-39-3	
Beryllium	**0.34J**	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 18:55	7440-41-7	
Cadmium	**0.046J**	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 18:55	7440-43-9	
Chromium	**8.7**	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 18:55	7440-47-3	
Cobalt	**1.7**	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 18:55	7440-48-4	
Lead	**1.4**	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 18:55	7439-92-1	
Molybdenum	**10.8**	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 18:55	7439-98-7	
Selenium	**0.40J**	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 18:55	7782-49-2	
Thallium	**0.040J**	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 18:55	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 12:23	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1620**	mg/L	5.0	5.0	1		04/25/17 15:01		
9040 pH	Analytical Method: EPA 9040								
pH	**7.9**	Std. Units	0.10	0.10	1		04/26/17 13:09		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**12.5**	mg/L	1.0	0.50	1		04/26/17 14:48	16887-00-6	
Fluoride	**4.0**	mg/L	0.20	0.10	1		04/26/17 14:48	16984-48-8	
Sulfate	**348**	mg/L	50.0	25.0	50		04/26/17 15:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: MW-122M **Lab ID: 60242501005** Collected: 04/20/17 08:30 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 08:30		
Groundwater Elevation	**724.04**	feet			1		04/20/17 08:30		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**4480**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:35	7440-42-8	
Calcium	**382**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:35	7440-70-2	
Lithium	**643**	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:35	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	ND	ug/L	3.0	0.079	3	04/24/17 16:50	05/03/17 19:20	7440-36-0	D3
Arsenic	**0.19J**	ug/L	3.0	0.16	3	04/24/17 16:50	05/03/17 19:20	7440-38-2	
Barium	**13.0**	ug/L	3.0	0.29	3	04/24/17 16:50	05/03/17 19:20	7440-39-3	
Beryllium	**0.054J**	ug/L	1.5	0.035	3	04/24/17 16:50	05/03/17 19:20	7440-41-7	
Cadmium	ND	ug/L	1.5	0.053	3	04/24/17 16:50	05/03/17 19:20	7440-43-9	D3
Chromium	**0.26J**	ug/L	3.0	0.16	3	04/24/17 16:50	05/03/17 19:20	7440-47-3	B
Cobalt	**1.4J**	ug/L	3.0	0.041	3	04/24/17 16:50	05/03/17 19:20	7440-48-4	
Lead	**0.22J**	ug/L	3.0	0.098	3	04/24/17 16:50	05/03/17 19:20	7439-92-1	
Molybdenum	**2.1J**	ug/L	3.0	0.17	3	04/24/17 16:50	05/03/17 19:20	7439-98-7	
Selenium	**0.33J**	ug/L	3.0	0.26	3	04/24/17 16:50	05/03/17 19:20	7782-49-2	
Thallium	ND	ug/L	3.0	0.11	3	04/24/17 16:50	05/03/17 19:20	7440-28-0	D3
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 12:25	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**18100**	mg/L	5.0	5.0	1		04/25/17 15:02		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		04/26/17 13:11		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.0**	mg/L	1.0	0.50	1		04/26/17 15:17	16887-00-6	
Fluoride	**0.88**	mg/L	0.20	0.10	1		04/26/17 15:17	16984-48-8	
Sulfate	**14300**	mg/L	1000	500	1000		04/26/17 15:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Sample: FIELD BLANK **Lab ID: 60242501006** Collected: 04/20/17 09:35 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	**10.7J**	ug/L	100	3.5	1	04/24/17 16:50	04/25/17 17:37	7440-42-8	B
Calcium	**0.062J**	mg/L	0.10	0.036	1	04/24/17 16:50	04/25/17 17:37	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	04/24/17 16:50	04/25/17 17:37	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 19:08	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	04/24/17 16:50	05/03/17 19:08	7440-38-2	
Barium	**0.20J**	ug/L	1.0	0.095	1	04/24/17 16:50	05/03/17 19:08	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.012	1	04/24/17 16:50	05/03/17 19:08	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	04/24/17 16:50	05/03/17 19:08	7440-43-9	
Chromium	**0.40J**	ug/L	1.0	0.054	1	04/24/17 16:50	05/03/17 19:08	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	04/24/17 16:50	05/03/17 19:08	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	04/24/17 16:50	05/03/17 19:08	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	04/24/17 16:50	05/03/17 19:08	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	04/24/17 16:50	05/03/17 19:08	7782-49-2	
Thallium	**0.043J**	ug/L	1.0	0.036	1	04/24/17 16:50	05/03/17 19:08	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 12:27	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		04/25/17 15:02		
9040 pH	Analytical Method: EPA 9040								
pH	**5.3**	Std. Units	0.10	0.10	1		04/27/17 09:01		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		04/26/17 09:25	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		04/26/17 09:25	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		04/26/17 09:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474522 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

METHOD BLANK: 1943373 Matrix: Water
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 473999 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

METHOD BLANK: 1941428 Matrix: Water
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

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	60242499001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474000 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

METHOD BLANK: 1941432 Matrix: Water
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

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 Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	40.2	39.8	100	99	75-125	1	20	
Arsenic	ug/L	0.25J	40	40	39.1	39.2	97	97	75-125	0	20	
Barium	ug/L	19.4	40	40	59.4	59.8	100	101	75-125	1	20	
Beryllium	ug/L	ND	40	40	32.6	32.2	82	81	75-125	1	20	
Cadmium	ug/L	0.20J	40	40	36.6	35.8	91	89	75-125	2	20	
Chromium	ug/L	1.0	40	40	40.0	40.7	97	99	75-125	2	20	
Cobalt	ug/L	0.95J	40	40	38.9	38.4	95	94	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1941434 1941435

Parameter	Units	60242499002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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 Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 473939 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60242501002, 60242501003

METHOD BLANK: 1941301 Matrix: Water
Associated Lab Samples: 60242501002, 60242501003

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	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474124 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60242501001, 60242501004, 60242501005, 60242501006

METHOD BLANK: 1941877 Matrix: Water
Associated Lab Samples: 60242501001, 60242501004, 60242501005, 60242501006

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	

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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(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 473975 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60242501002, 60242501003, 60242501004, 60242501005

SAMPLE DUPLICATE: 1941389

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474264
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Associated Lab Samples: 60242501006

SAMPLE DUPLICATE: 1942399

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474668
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Associated Lab Samples: 60242501001

SAMPLE DUPLICATE: 1943860

Parameter	Units	60242501001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	6.9	7.1	3	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.

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474218 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

METHOD BLANK: 1942227 Matrix: Water
Associated Lab Samples: 60242501001, 60242501002, 60242501003, 60242501004, 60242501005, 60242501006

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

QC Batch: 474409 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60242501001

METHOD BLANK: 1942841 Matrix: Water
Associated Lab Samples: 60242501001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	04/27/17 07:44	

LABORATORY CONTROL SAMPLE: 1942842

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1942843 1942844

Parameter	Units	60242652006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.5	5	5	16.8	16.7	106	105	80-120	0	15	

SAMPLE DUPLICATE: 1942845

Parameter	Units	60242807001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	12.1	12.1	0	15	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242501

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60242501001	MW-301		475228		
60242501002	MW-302		475228		
60242501003	MW-303		475228		
60242501004	MW-102M		475228		
60242501005	MW-122M		475228		
60242501001	MW-301	EPA 3010	473999	EPA 6010	474020
60242501002	MW-302	EPA 3010	473999	EPA 6010	474020
60242501003	MW-303	EPA 3010	473999	EPA 6010	474020
60242501004	MW-102M	EPA 3010	473999	EPA 6010	474020
60242501005	MW-122M	EPA 3010	473999	EPA 6010	474020
60242501006	FIELD BLANK	EPA 3010	473999	EPA 6010	474020
60242501001	MW-301	EPA 3010	474000	EPA 6020	474021
60242501002	MW-302	EPA 3010	474000	EPA 6020	474021
60242501003	MW-303	EPA 3010	474000	EPA 6020	474021
60242501004	MW-102M	EPA 3010	474000	EPA 6020	474021
60242501005	MW-122M	EPA 3010	474000	EPA 6020	474021
60242501006	FIELD BLANK	EPA 3010	474000	EPA 6020	474021
60242501001	MW-301	EPA 7470	474522	EPA 7470	474566
60242501002	MW-302	EPA 7470	474522	EPA 7470	474566
60242501003	MW-303	EPA 7470	474522	EPA 7470	474566
60242501004	MW-102M	EPA 7470	474522	EPA 7470	474566
60242501005	MW-122M	EPA 7470	474522	EPA 7470	474566
60242501006	FIELD BLANK	EPA 7470	474522	EPA 7470	474566
60242501001	MW-301	SM 2540C	474124		
60242501002	MW-302	SM 2540C	473939		
60242501003	MW-303	SM 2540C	473939		
60242501004	MW-102M	SM 2540C	474124		
60242501005	MW-122M	SM 2540C	474124		
60242501006	FIELD BLANK	SM 2540C	474124		
60242501001	MW-301	EPA 9040	474668		
60242501002	MW-302	EPA 9040	473975		
60242501003	MW-303	EPA 9040	473975		
60242501004	MW-102M	EPA 9040	473975		
60242501005	MW-122M	EPA 9040	473975		
60242501006	FIELD BLANK	EPA 9040	474264		
60242501001	MW-301	EPA 9056	474218		
60242501001	MW-301	EPA 9056	474409		
60242501002	MW-302	EPA 9056	474218		
60242501003	MW-303	EPA 9056	474218		
60242501004	MW-102M	EPA 9056	474218		
60242501005	MW-122M	EPA 9056	474218		
60242501006	FIELD BLANK	EPA 9056	474218		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60242501

60242501

Client Name: SCS Eng.

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

Tracking #: 8677 7489 2819 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 / CF +0.2 T-266 / T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 3.3 **Corr. Factor** CF +1.5 CF +0.2 **Corrected** 4.8

Date and initials of person examining contents: 4/21/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☑ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Date: 4-21-17

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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:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																	Y/N	N	N	N					60242501
1	MW-301	WT	G	xxx	xxx	4-20-17	10:05	13.0	2	1		1						X	X	X	X	X	X		BR2N BR2M 001
2	MW-302	WT	G	xxx	xxx	4-19-17	15:00	14.5	2	1		1						X	X	X	X	X	X		002
3	MW-303	WT	G	xxx	xxx	4-19-17	15:30	13.7	2	1		1						X	X	X	X	X	X		003
4	MW-102M	WT	G	xxx	xxx	4-20-17	7:35	NA	2	1		1						X	X	X	X	X	X		004
5	MW-122M	WT	G	xxx	xxx	4-20-17	8:30	NA	2	1		1						X	X	X	X	X	X		005
6	FIELD BLANK	WT	G	xxx	xxx	4-20-17	9:35	—	2	1		1						X	X	X	X	X	X		006
7																									
8																									
9																									
10																									
11																									
12																									

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Snow	4/20/17	16:00	URI	4/21/17	0920	4.8	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl							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):

*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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 16, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

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

Enclosures

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60242520001	**MW-301**	Water	04/20/17 10:05	04/21/17 09:20
60242520002	**MW-302**	Water	04/19/17 15:00	04/21/17 09:20
60242520003	**MW-303**	Water	04/19/17 15:30	04/21/17 09:20
60242520004	**MW-102M**	Water	04/20/17 07:35	04/21/17 09:20
60242520005	**MW-122M**	Water	04/20/17 08:30	04/21/17 09:20
60242520006	**FIELD BLANK**	Water	04/20/17 09:35	04/21/17 09:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60242520001	**MW-301**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242520002	**MW-302**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242520003	**MW-303**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242520004	**MW-102M**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242520005	**MW-122M**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60242520006	**FIELD BLANK**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: MW-301 **Lab ID: 60242520001** Collected: 04/20/17 10:05 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	**0.855 ± 0.545 (0.658) C:NA T:88%**	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	**0.488 ± 0.426 (0.864) C:68% T:88%**	pCi/L	05/08/17 18:46	15262-20-1	
Total Radium	Total Radium Calculation	**1.34 ± 0.971 (1.52)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: MW-302 **Lab ID: 60242520002** Collected: 04/19/17 15:00 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	**0.872 ± 0.613 (0.782) C:NA T:71%**	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	**0.777 ± 0.402 (0.703) C:80% T:79%**	pCi/L	05/08/17 18:49	15262-20-1	
Total Radium	Total Radium Calculation	**1.65 ± 1.02 (1.49)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: MW-303 **Lab ID: 60242520003** Collected: 04/19/17 15:30 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	**0.481 ± 0.503 (0.788) C:NA T:85%**	pCi/L	05/08/17 19:47	13982-63-3	
Radium-228	EPA 904.0	**1.34 ± 1.00 (1.98) C:69% T:38%**	pCi/L	05/08/17 18:47	15262-20-1	
Total Radium	Total Radium Calculation	**1.82 ± 1.50 (2.77)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: MW-102M **Lab ID: 60242520004** Collected: 04/20/17 07:35 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	**0.754 ± 0.609 (0.886) C:NA T:81%**	pCi/L	05/08/17 20:05	13982-63-3	
Radium-228	EPA 904.0	**0.816 ± 0.565 (1.09) C:70% T:66%**	pCi/L	05/08/17 18:47	15262-20-1	
Total Radium	Total Radium Calculation	**1.57 ± 1.17 (1.98)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: MW-122M **Lab ID: 60242520005** Collected: 04/20/17 08:30 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	**0.796 ± 0.786 (1.20) C:NA T:92%**	pCi/L	05/08/17 20:05	13982-63-3	
Radium-228	EPA 904.0	**0.305 ± 0.510 (1.11) C:77% T:65%**	pCi/L	05/08/17 18:47	15262-20-1	
Total Radium	Total Radium Calculation	**1.10 ± 1.30 (2.31)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Sample: FIELD BLANK **Lab ID: 60242520006** Collected: 04/20/17 09:35 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	**-0.059 ± 0.269 (0.546) C:NA T:94%**	pCi/L	05/08/17 20:05	13982-63-3	
Radium-228	EPA 904.0	**0.171 ± 0.358 (0.791) C:76% T:82%**	pCi/L	05/08/17 18:48	15262-20-1	
Total Radium	Total Radium Calculation	**0.171 ± 0.627 (1.34)**	pCi/L	05/16/17 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

QC Batch: 256704 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60242520001, 60242520002, 60242520003, 60242520004, 60242520005, 60242520006

METHOD BLANK: 1264281 Matrix: Water
Associated Lab Samples: 60242520001, 60242520002, 60242520003, 60242520004, 60242520005, 60242520006

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

QC Batch: 256703 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60242520001, 60242520002, 60242520003, 60242520004, 60242520005, 60242520006

METHOD BLANK: 1264280 Matrix: Water
Associated Lab Samples: 60242520001, 60242520002, 60242520003, 60242520004, 60242520005, 60242520006

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	

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 Midland LF/25216073
Pace Project No.: 60242520

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

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60242520

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60242520001	**MW-301**	EPA 903.1	256703		
60242520002	**MW-302**	EPA 903.1	256703		
60242520003	**MW-303**	EPA 903.1	256703		
60242520004	**MW-102M**	EPA 903.1	256703		
60242520005	**MW-122M**	EPA 903.1	256703		
60242520006	**FIELD BLANK**	EPA 903.1	256703		
60242520001	**MW-301**	EPA 904.0	256704		
60242520002	**MW-302**	EPA 904.0	256704		
60242520003	**MW-303**	EPA 904.0	256704		
60242520004	**MW-102M**	EPA 904.0	256704		
60242520005	**MW-122M**	EPA 904.0	256704		
60242520006	**FIELD BLANK**	EPA 904.0	256704		
60242520001	**MW-301**	Total Radium Calculation	258652		
60242520002	**MW-302**	Total Radium Calculation	258652		
60242520003	**MW-303**	Total Radium Calculation	258652		
60242520004	**MW-102M**	Total Radium Calculation	258652		
60242520005	**MW-122M**	Total Radium Calculation	258652		
60242520006	**FIELD BLANK**	Total Radium Calculation	258652		

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Sample Condition Upon Receipt

WO# : 60242520

60242520

Client Name: SCS Eng.

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

Tracking #: 8107 1388 8712 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 +0.2 T-239 **Type of Ice:** Wet Blue (None)

Cooler Temperature (°C): **As-read** 16.3 **Corr. Factor** CF +1.5 CF +0.2 **Corrected** 17.8

Date and initials of person examining contents: 4/21/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	Limited volume for MW-122 M about 1.25 L
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

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

TDG

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

CHAIN-OF-CUSTODY / Analytical Request Document

Pace Analytical www.pacelabs.com

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:
Requested Due Date/TAT:	

Section B — **Required** Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	4-20-17	10:25	13.2	2			2							X	X	X		(2) BPIN 001
2	MW-302	WT	G	xxx	xxx	4-19-17	15:00	14.0	2			2							X	X	X		002
3	MW-303	WT	G	xxx	xxx	↓	15:30	13.7	2			2							X	X	X		003
4	MW-102M	WT	G	xxx	xxx	4-20-17	7:35	NA	2			2							X	X	X		004
5	MW-122M	WT	G	xxx	xxx	↓	8:30	NA	2			2							X	X	X		005
6	FIELD BLANK	WT	G	xxx	xxx	↓	9:35	—	2			2							X	X	X		006
7																							
8																							
9																							
10																							
11																							
12																							

60242520

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. [signature]	4/20/17	16:00	[signature]	4/21/17	0920	7.8	Y	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.

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

Chain of Custody

30217007

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www.pacelabs.com

Workorder: 60242520 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 4/21/2017 **Results Requested By:** 5/16/2017

Report To	Subcontract To
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#:30217007

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3						Requested Analysis: 903.1 Radium-226	904.0 Radium-228	Total Radium									LAB USE ONLY
1	MW-301	PS	4/20/2017 10:05	60242520001	Water	2						X	X	X									001
2	MW-302	PS	4/19/2017 15:00	60242520002	Water	2						X	X	X									002
3	MW-303	PS	4/19/2017 15:30	60242520003	Water	2						X	X	X									003
4	MW-102M	PS	4/20/2017 07:35	60242520004	Water	2						X	X	X									004
5	MW-122M	PS	4/20/2017 08:30	60242520005	Water	2						X	X	X									005
6	FIELD BLANK	PS	4/20/2017 09:35	60242520006	Water	2						X	X	X									006

Transfers	Released By	Date/Time	Received	Date/Time	Comments
1	[signature]	4/21/17 1700	[signature] Pace	4/25/17	000
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.*

Sample Condition Upon Receipt Pittsburgh ML 30217007

Pace Analytical

Client Name: Pace KS Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: Kipped Off

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 4/26/17

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: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9. Low volume for sample 006.
Correct Containers Used: -Pace Containers Used:	✓			10.
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. All containers needing preservation are found to be in compliance with EPA recommendation.	✓			15. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ARM 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: ARM Date: 4/26/17

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.

A7 Round 7 Background Sampling, Analytical Laboratory Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 05, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

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

Enclosures

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247195001	**MW-301**	Water	06/20/17 14:15	06/23/17 08:35
60247195002	**MW-302**	Water	06/20/17 13:10	06/23/17 08:35
60247195003	**MW-102M**	Water	06/21/17 14:25	06/23/17 08:35
60247195004	**MW-122M**	Water	06/21/17 13:50	06/23/17 08:35
60247195005	**FIELD BLANK**	Water	06/20/17 14:25	06/23/17 08:35

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247195001	**MW-301**	EPA 6010	SMW	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
60247195002	**MW-302**	EPA 6010	SMW	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
60247195003	**MW-102M**	EPA 6010	SMW	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
60247195004	**MW-122M**	EPA 6010	SMW	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
60247195005	**FIELD BLANK**	EPA 6010	SMW	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

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Sample: MW-301 **Lab ID: 60247195001** Collected: 06/20/17 14:15 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 14:15		
Field pH	**6.73**	Std. Units	0.10	0.050	1		06/20/17 14:15		
Field Temperature	**13.8**	deg C	0.50	0.25	1		06/20/17 14:15		
Field Specific Conductance	**2384**	umhos/cm	1.0	1.0	1		06/20/17 14:15		
Field Oxidation Potential	**-63.1**	mV			1		06/20/17 14:15		
Oxygen, Dissolved	**0.16**	mg/L			1		06/20/17 14:15	7782-44-7	
Turbidity	**2.69**	NTU	1.0	1.0	1		06/20/17 14:15		
Groundwater Elevation	**685.88**	feet			1		06/20/17 14:15		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1040**	ug/L	100	3.5	1	06/29/17 16:25	06/30/17 11:09	7440-42-8	
Calcium	**202**	mg/L	0.10	0.036	1	06/29/17 16:25	06/30/17 11:09	7440-70-2	
Lithium	**111**	ug/L	10.0	2.9	1	06/29/17 16:25	06/30/17 11:09	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**0.058J**	ug/L	1.0	0.026	1	06/29/17 16:25	06/30/17 15:49	7440-36-0	B
Arsenic	**0.42J**	ug/L	1.0	0.052	1	06/29/17 16:25	06/30/17 15:49	7440-38-2	
Barium	**47.1**	ug/L	1.0	0.095	1	06/29/17 16:25	06/30/17 15:49	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/29/17 16:25	06/30/17 15:49	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/29/17 16:25	06/30/17 15:49	7440-43-9	
Chromium	**0.16J**	ug/L	1.0	0.054	1	06/29/17 16:25	06/30/17 15:49	7440-47-3	
Cobalt	**0.22J**	ug/L	1.0	0.014	1	06/29/17 16:25	06/30/17 15:49	7440-48-4	
Lead	**0.038J**	ug/L	1.0	0.033	1	06/29/17 16:25	06/30/17 15:49	7439-92-1	B
Molybdenum	**5.3**	ug/L	1.0	0.058	1	06/29/17 16:25	06/30/17 15:49	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	06/29/17 16:25	06/30/17 15:49	7782-49-2	
Thallium	**0.076J**	ug/L	1.0	0.036	1	06/29/17 16:25	06/30/17 15:49	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 10:15	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**2060**	mg/L	5.0	5.0	1		06/26/17 07:56		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		06/27/17 13:12		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**38.9**	mg/L	5.0	2.5	5		06/26/17 23:44	16887-00-6	
Fluoride	**0.93**	mg/L	0.20	0.10	1		06/27/17 00:49	16984-48-8	
Sulfate	**1180**	mg/L	100	50.0	100		06/27/17 00:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Sample: MW-302 **Lab ID: 60247195002** Collected: 06/20/17 13:10 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		06/20/17 13:10		
Field pH	**7.29**	Std. Units	0.10	0.050	1		06/20/17 13:10		
Field Temperature	**14**	deg C	0.50	0.25	1		06/20/17 13:10		
Field Specific Conductance	**1018**	umhos/cm	1.0	1.0	1		06/20/17 13:10		
Field Oxidation Potential	**-66.8**	mV			1		06/20/17 13:10		
Oxygen, Dissolved	**0.22**	mg/L			1		06/20/17 13:10	7782-44-7	
Turbidity	**58.63**	NTU	1.0	1.0	1		06/20/17 13:10		
Groundwater Elevation	**684.76**	feet			1		06/20/17 13:10		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**767**	ug/L	100	3.5	1	06/29/17 16:25	06/30/17 11:11	7440-42-8	
Calcium	**46.1**	mg/L	0.10	0.036	1	06/29/17 16:25	06/30/17 11:11	7440-70-2	
Lithium	**78.5**	ug/L	10.0	2.9	1	06/29/17 16:25	06/30/17 11:11	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.094J**	ug/L	1.0	0.026	1	06/29/17 16:25	06/30/17 16:15	7440-36-0	B
Arsenic	**0.25J**	ug/L	1.0	0.052	1	06/29/17 16:25	06/30/17 16:15	7440-38-2	
Barium	**49.9**	ug/L	1.0	0.095	1	06/29/17 16:25	06/30/17 16:15	7440-39-3	
Beryllium	**0.084J**	ug/L	0.50	0.012	1	06/29/17 16:25	06/30/17 16:15	7440-41-7	
Cadmium	**0.018J**	ug/L	0.50	0.018	1	06/29/17 16:25	06/30/17 16:15	7440-43-9	
Chromium	**2.2**	ug/L	1.0	0.054	1	06/29/17 16:25	06/30/17 16:15	7440-47-3	
Cobalt	**0.38J**	ug/L	1.0	0.014	1	06/29/17 16:25	06/30/17 16:15	7440-48-4	
Lead	**0.36J**	ug/L	1.0	0.033	1	06/29/17 16:25	06/30/17 16:15	7439-92-1	B
Molybdenum	**0.17J**	ug/L	1.0	0.058	1	06/29/17 16:25	06/30/17 16:15	7439-98-7	
Selenium	**0.21J**	ug/L	1.0	0.086	1	06/29/17 16:25	06/30/17 16:15	7782-49-2	
Thallium	**0.065J**	ug/L	1.0	0.036	1	06/29/17 16:25	06/30/17 16:15	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 10:17	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**656**	mg/L	5.0	5.0	1		06/26/17 07:56		
9040 pH	Analytical Method: EPA 9040								
pH	**7.6**	Std. Units	0.10	0.10	1		06/27/17 13:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.0**	mg/L	1.0	0.50	1		06/27/17 01:05	16887-00-6	
Fluoride	**1.1**	mg/L	0.20	0.10	1		06/27/17 01:05	16984-48-8	
Sulfate	**79.3**	mg/L	10.0	5.0	10		06/27/17 01:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Sample: MW-102M **Lab ID: 60247195003** Collected: 06/21/17 14:25 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 14:25		
Field pH	**7.64**	Std. Units	0.10	0.050	1		06/21/17 14:25		
Groundwater Elevation	**714.83**	feet			1		06/21/17 14:25		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1410**	ug/L	100	3.5	1	06/29/17 16:25	06/30/17 11:18	7440-42-8	
Calcium	**67.7**	mg/L	0.10	0.036	1	06/29/17 16:25	06/30/17 11:18	7440-70-2	
Lithium	**52.7**	ug/L	10.0	2.9	1	06/29/17 16:25	06/30/17 11:18	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.21J**	ug/L	1.0	0.026	1	06/29/17 16:25	06/30/17 16:19	7440-36-0	B
Arsenic	**0.90J**	ug/L	1.0	0.052	1	06/29/17 16:25	06/30/17 16:19	7440-38-2	
Barium	**37.2**	ug/L	1.0	0.095	1	06/29/17 16:25	06/30/17 16:19	7440-39-3	
Beryllium	**0.54**	ug/L	0.50	0.012	1	06/29/17 16:25	06/30/17 16:19	7440-41-7	
Cadmium	**0.063J**	ug/L	0.50	0.018	1	06/29/17 16:25	06/30/17 16:19	7440-43-9	
Chromium	**16.0**	ug/L	1.0	0.054	1	06/29/17 16:25	06/30/17 16:19	7440-47-3	
Cobalt	**2.1**	ug/L	1.0	0.014	1	06/29/17 16:25	06/30/17 16:19	7440-48-4	
Lead	**2.2**	ug/L	1.0	0.033	1	06/29/17 16:25	06/30/17 16:19	7439-92-1	
Molybdenum	**11.1**	ug/L	1.0	0.058	1	06/29/17 16:25	06/30/17 16:19	7439-98-7	
Selenium	**0.49J**	ug/L	1.0	0.086	1	06/29/17 16:25	06/30/17 16:19	7782-49-2	
Thallium	**0.084J**	ug/L	1.0	0.036	1	06/29/17 16:25	06/30/17 16:19	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 10:19	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1480**	mg/L	5.0	5.0	1		06/26/17 08:01		
9040 pH	Analytical Method: EPA 9040								
pH	**8.0**	Std. Units	0.10	0.10	1		06/29/17 13:00		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**12.8**	mg/L	1.0	0.50	1		06/27/17 02:10	16887-00-6	
Fluoride	**4.6**	mg/L	0.20	0.10	1		06/27/17 02:10	16984-48-8	
Sulfate	**356**	mg/L	50.0	25.0	50		06/27/17 15:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Sample: MW-122M **Lab ID: 60247195004** Collected: 06/21/17 13:50 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 13:50		
Field pH	**6.42**	Std. Units	0.10	0.050	1		06/21/17 13:50		
Groundwater Elevation	**723.51**	feet			1		06/21/17 13:50		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**4710**	ug/L	100	3.5	1	06/29/17 16:25	06/30/17 11:20	7440-42-8	
Calcium	**386**	mg/L	0.10	0.036	1	06/29/17 16:25	06/30/17 11:20	7440-70-2	
Lithium	**640**	ug/L	10.0	2.9	1	06/29/17 16:25	06/30/17 11:20	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	5.0	0.13	5	06/29/17 16:25	06/30/17 16:45	7440-36-0	D3
Arsenic	ND	ug/L	5.0	0.26	5	06/29/17 16:25	06/30/17 16:45	7440-38-2	D3
Barium	**11.2**	ug/L	5.0	0.48	5	06/29/17 16:25	06/30/17 16:45	7440-39-3	
Beryllium	ND	ug/L	1.5	0.035	3	06/29/17 16:25	06/30/17 16:41	7440-41-7	D3
Cadmium	ND	ug/L	2.5	0.089	5	06/29/17 16:25	06/30/17 16:45	7440-43-9	D3
Chromium	ND	ug/L	5.0	0.27	5	06/29/17 16:25	06/30/17 16:45	7440-47-3	D3
Cobalt	**1.2J**	ug/L	5.0	0.068	5	06/29/17 16:25	06/30/17 16:45	7440-48-4	
Lead	ND	ug/L	5.0	0.16	5	06/29/17 16:25	06/30/17 16:45	7439-92-1	D3
Molybdenum	**0.60J**	ug/L	3.0	0.17	3	06/29/17 16:25	06/30/17 16:41	7439-98-7	
Selenium	ND	ug/L	5.0	0.43	5	06/29/17 16:25	06/30/17 16:45	7782-49-2	D3
Thallium	ND	ug/L	5.0	0.18	5	06/29/17 16:25	06/30/17 16:45	7440-28-0	D3
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 10:21	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**12800**	mg/L	5.0	5.0	1		06/26/17 08:02		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		06/27/17 13:31		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.8**	mg/L	1.0	0.50	1		06/27/17 02:42	16887-00-6	
Fluoride	**1.1**	mg/L	0.20	0.10	1		06/27/17 02:42	16984-48-8	
Sulfate	**17500**	mg/L	1000	500	1000		06/27/17 02:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Sample: FIELD BLANK **Lab ID: 60247195005** Collected: 06/20/17 14:25 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	**8.3J**	ug/L	100	3.5	1	06/29/17 16:25	06/30/17 11:23	7440-42-8	
Calcium	**0.076J**	mg/L	0.10	0.036	1	06/29/17 16:25	06/30/17 11:23	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	06/29/17 16:25	06/30/17 11:23	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.032J**	ug/L	1.0	0.026	1	06/29/17 16:25	06/30/17 16:32	7440-36-0	B
Arsenic	ND	ug/L	1.0	0.052	1	06/29/17 16:25	06/30/17 16:32	7440-38-2	
Barium	**0.13J**	ug/L	1.0	0.095	1	06/29/17 16:25	06/30/17 16:32	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	06/29/17 16:25	06/30/17 16:32	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	06/29/17 16:25	06/30/17 16:32	7440-43-9	
Chromium	**0.097J**	ug/L	1.0	0.054	1	06/29/17 16:25	06/30/17 16:32	7440-47-3	
Cobalt	ND	ug/L	1.0	0.014	1	06/29/17 16:25	06/30/17 16:32	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	06/29/17 16:25	06/30/17 16:32	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	06/29/17 16:25	06/30/17 16:32	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	06/29/17 16:25	06/30/17 16:32	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	06/29/17 16:25	06/30/17 16:32	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.046	1	07/03/17 14:32	07/05/17 10:24	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 07:58		
9040 pH	Analytical Method: EPA 9040								
pH	**5.9**	Std. Units	0.10	0.10	1		06/27/17 13:14		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		06/26/17 14:18	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		06/26/17 14:18	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		06/26/17 14:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 483788 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

METHOD BLANK: 1982091 Matrix: Water
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

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	

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 Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 483237 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

METHOD BLANK: 1979510 Matrix: Water
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	3.5	06/30/17 11:04	
Calcium	mg/L	ND	0.10	0.036	06/30/17 11:04	
Lithium	ug/L	ND	10.0	2.9	06/30/17 11:04	

LABORATORY CONTROL SAMPLE: 1979511

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	966	97	80-120	
Calcium	mg/L	10	10.1	101	80-120	
Lithium	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979512 1979513

Parameter	Units	60247195002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	767	1000	1000	1780	1780	102	101	75-125	0	20	
Calcium	mg/L	46.1	10	10	56.5	56.3	104	102	75-125	0	20	
Lithium	ug/L	78.5	1000	1000	1110	1110	103	103	75-125	0	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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 483236 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

METHOD BLANK: 1979506 Matrix: Water
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.029J	1.0	0.026	06/30/17 15:41	
Arsenic	ug/L	ND	1.0	0.052	06/30/17 15:41	
Barium	ug/L	ND	1.0	0.095	06/30/17 15:41	
Beryllium	ug/L	ND	0.50	0.012	06/30/17 15:41	
Cadmium	ug/L	ND	0.50	0.018	06/30/17 15:41	
Chromium	ug/L	ND	1.0	0.054	06/30/17 15:41	
Cobalt	ug/L	ND	1.0	0.014	06/30/17 15:41	
Lead	ug/L	0.057J	1.0	0.033	06/30/17 15:41	
Molybdenum	ug/L	ND	1.0	0.058	06/30/17 15:41	
Selenium	ug/L	ND	1.0	0.086	06/30/17 15:41	
Thallium	ug/L	0.048J	1.0	0.036	06/30/17 15:41	

LABORATORY CONTROL SAMPLE: 1979507

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.8	100	80-120	
Arsenic	ug/L	40	39.6	99	80-120	
Barium	ug/L	40	40.1	100	80-120	
Beryllium	ug/L	40	40.3	101	80-120	
Cadmium	ug/L	40	39.3	98	80-120	
Chromium	ug/L	40	41.1	103	80-120	
Cobalt	ug/L	40	41.5	104	80-120	
Lead	ug/L	40	39.5	99	80-120	
Molybdenum	ug/L	40	42.3	106	80-120	
Selenium	ug/L	40	38.9	97	80-120	
Thallium	ug/L	40	37.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979508 1979509

Parameter	Units	60247195001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.058J	40	40	38.5	38.7	96	97	75-125	0	20	
Arsenic	ug/L	0.42J	40	40	38.3	38.8	95	96	75-125	1	20	
Barium	ug/L	47.1	40	40	87.8	88.0	102	102	75-125	0	20	
Beryllium	ug/L	ND	40	40	32.0	31.9	80	80	75-125	0	20	
Cadmium	ug/L	ND	40	40	34.6	35.0	87	88	75-125	1	20	
Chromium	ug/L	0.16J	40	40	39.7	40.0	99	100	75-125	1	20	
Cobalt	ug/L	0.22J	40	40	38.5	38.4	96	96	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979508 1979509

Parameter	Units	60247195001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.038J	40	40	34.5	34.4	86	86	75-125	0	20	
Molybdenum	ug/L	5.3	40	40	47.2	47.1	105	105	75-125	0	20	
Selenium	ug/L	ND	40	40	35.6	34.7	89	87	75-125	3	20	
Thallium	ug/L	0.076J	40	40	34.4	34.1	86	85	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 482462 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

METHOD BLANK: 1976891 Matrix: Water
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 482814 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60247195001, 60247195002, 60247195004, 60247195005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 483293
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Associated Lab Samples: 60247195003

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 482525 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

METHOD BLANK: 1977053 Matrix: Water
Associated Lab Samples: 60247195001, 60247195002, 60247195003, 60247195004, 60247195005

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

QC Batch: 482672 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60247195003

METHOD BLANK: 1977449 Matrix: Water
Associated Lab Samples: 60247195003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	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
Sulfate	mg/L	5	5.4	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1977451 1977452

Parameter	Units	60247194004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	254			460	458				0	15	

SAMPLE DUPLICATE: 1977453

Parameter	Units	60247195003 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	356	355	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247195

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247195001	**MW-301**		483795		
60247195002	**MW-302**		483795		
60247195003	**MW-102M**		483795		
60247195004	**MW-122M**		483795		
60247195001	**MW-301**	EPA 3010	483237	EPA 6010	483430
60247195002	**MW-302**	EPA 3010	483237	EPA 6010	483430
60247195003	**MW-102M**	EPA 3010	483237	EPA 6010	483430
60247195004	**MW-122M**	EPA 3010	483237	EPA 6010	483430
60247195005	**FIELD BLANK**	EPA 3010	483237	EPA 6010	483430
60247195001	**MW-301**	EPA 3010	483236	EPA 6020	483432
60247195002	**MW-302**	EPA 3010	483236	EPA 6020	483432
60247195003	**MW-102M**	EPA 3010	483236	EPA 6020	483432
60247195004	**MW-122M**	EPA 3010	483236	EPA 6020	483432
60247195005	**FIELD BLANK**	EPA 3010	483236	EPA 6020	483432
60247195001	**MW-301**	EPA 7470	483788	EPA 7470	483842
60247195002	**MW-302**	EPA 7470	483788	EPA 7470	483842
60247195003	**MW-102M**	EPA 7470	483788	EPA 7470	483842
60247195004	**MW-122M**	EPA 7470	483788	EPA 7470	483842
60247195005	**FIELD BLANK**	EPA 7470	483788	EPA 7470	483842
60247195001	**MW-301**	SM 2540C	482462		
60247195002	**MW-302**	SM 2540C	482462		
60247195003	**MW-102M**	SM 2540C	482462		
60247195004	**MW-122M**	SM 2540C	482462		
60247195005	**FIELD BLANK**	SM 2540C	482462		
60247195001	**MW-301**	EPA 9040	482814		
60247195002	**MW-302**	EPA 9040	482814		
60247195003	**MW-102M**	EPA 9040	483293		
60247195004	**MW-122M**	EPA 9040	482814		
60247195005	**FIELD BLANK**	EPA 9040	482814		
60247195001	**MW-301**	EPA 9056	482525		
60247195002	**MW-302**	EPA 9056	482525		
60247195003	**MW-102M**	EPA 9056	482525		
60247195003	**MW-102M**	EPA 9056	482672		
60247195004	**MW-122M**	EPA 9056	482525		
60247195005	**FIELD BLANK**	EPA 9056	482525		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60247195

60247195

Client Name: SCS Eng.

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

Tracking #: 7785 6593 2610; — 2600 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 +2.9 T-266 / CF +0.2 T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 2.6, 1.2 **Corr. Factor** CF +2.9 CF +0.2 **Corrected** 3.0, 1.4

Date and initials of person examining contents: JD 6/23/17 1430

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: water	☐Yes ☐No ☒N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	 ☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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

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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:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				DATE	TIME	DATE	TIME											N	N	N							
1	MW-301	WT	G	xxx	xxx	6/22/17	14:15		3	1		2							X	X	X	X	X	X		2(BBW)"5 1(BBW) 001
2	MW-302	WT	G	xxx	xxx	↓	13:10		3	1		2							X	X	X	X	X	X		↓ 002
3	VOID ~~MW-303~~	WT	G	~~xxx~~	~~xxx~~				3	1		2							X	X	X	X	X	X		Not Sampled
4	MW-102M	WT	G	xxx	xxx	6/21/17	14:25		3	1		2							X	X	X	X	X	X		2(BBW)"5 1(BBW) 003
5	MW-122M	WT	G	xxx	xxx	↓	13:50		3	1		2							X	X	X	X	X	X		004
6	FIELD BLANK	WT	G	xxx	xxx	6/20/17	14:25		3	1		2							X	X	X	X	X	X		↓ 005
7																										
8																										
9																										
10																										
11																										
12																										

6024795

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Lyons	6/22/17	20:08		6/23/17	8:35
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl						

SAMPLE CONDITIONS				
Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)	
3.0	Y	Y	Y	
1.4	Y	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.

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

Pace Analytical Services, LLC
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(913)599-5665

July 17, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

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

Enclosures

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

Pace Analytical Services, LLC
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(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247198001	**MW-301**	Water	06/20/17 14:15	06/23/17 08:35
60247198002	**MW-302**	Water	06/20/17 13:10	06/23/17 08:35
60247198003	**MW-102M**	Water	06/21/17 14:25	06/23/17 08:35
60247198004	**MW-122M**	Water	06/21/17 13:50	06/23/17 08:35
60247198005	**FIELD BLANK**	Water	06/20/17 14:25	06/23/17 08:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247198001	**MW-301**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247198002	**MW-302**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247198003	**MW-102M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247198004	**MW-122M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60247198005	**FIELD BLANK**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Sample: MW-301 **Lab ID: 60247198001** Collected: 06/20/17 14:15 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	**0.734 ± 0.408 (0.153) C:NA T:97%**	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	**0.829 ± 0.417 (0.730) C:77% T:84%**	pCi/L	07/13/17 15:54	15262-20-1	
Total Radium	Total Radium Calculation	**1.56 ± 0.825 (0.883)**	pCi/L	07/17/17 13:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Sample: MW-302 **Lab ID: 60247198002** Collected: 06/20/17 13:10 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	**0.987 ± 0.497 (0.167) C:NA T:92%**	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	**0.549 ± 0.433 (0.870) C:76% T:83%**	pCi/L	07/13/17 15:55	15262-20-1	
Total Radium	Total Radium Calculation	**1.54 ± 0.930 (1.04)**	pCi/L	07/17/17 13:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Sample: MW-102M **Lab ID: 60247198003** Collected: 06/21/17 14:25 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	**0.285 ± 0.297 (0.419) C:NA T:95%**	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	**0.832 ± 0.424 (0.755) C:79% T:87%**	pCi/L	07/13/17 15:55	15262-20-1	
Total Radium	Total Radium Calculation	**1.12 ± 0.721 (1.17)**	pCi/L	07/17/17 13:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Sample: MW-122M **Lab ID: 60247198004** Collected: 06/21/17 13:50 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	**0.333 ± 0.393 (0.618) C:NA T:82%**	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	**1.22 ± 0.508 (0.822) C:78% T:77%**	pCi/L	07/13/17 15:55	15262-20-1	
Total Radium	Total Radium Calculation	**1.55 ± 0.901 (1.44)**	pCi/L	07/17/17 13:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Sample: FIELD BLANK **Lab ID: 60247198005** Collected: 06/20/17 14:25 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	**-0.063 ± 0.290 (0.683) C:NA T:87%**	pCi/L	07/11/17 21:03	13982-63-3	
Radium-228	EPA 904.0	**0.663 ± 0.562 (1.11) C:77% T:81%**	pCi/L	07/13/17 15:58	15262-20-1	
Total Radium	Total Radium Calculation	**0.663 ± 0.852 (1.79)**	pCi/L	07/17/17 13:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

QC Batch: 263771 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60247198001, 60247198002, 60247198003, 60247198004, 60247198005

METHOD BLANK: 1299245 Matrix: Water
Associated Lab Samples: 60247198001, 60247198002, 60247198003, 60247198004, 60247198005

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

QC Batch: 264361 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60247198001, 60247198002, 60247198003, 60247198004, 60247198005

METHOD BLANK: 1302000 Matrix: Water
Associated Lab Samples: 60247198001, 60247198002, 60247198003, 60247198004, 60247198005

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 Midland LF/25216073
Pace Project No.: 60247198

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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60247198

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247198001	**MW-301**	EPA 903.1	263771		
60247198002	**MW-302**	EPA 903.1	263771		
60247198003	**MW-102M**	EPA 903.1	263771		
60247198004	**MW-122M**	EPA 903.1	263771		
60247198005	**FIELD BLANK**	EPA 903.1	263771		
60247198001	**MW-301**	EPA 904.0	264361		
60247198002	**MW-302**	EPA 904.0	264361		
60247198003	**MW-102M**	EPA 904.0	264361		
60247198004	**MW-122M**	EPA 904.0	264361		
60247198005	**FIELD BLANK**	EPA 904.0	264361		
60247198001	**MW-301**	Total Radium Calculation	265215		
60247198002	**MW-302**	Total Radium Calculation	265215		
60247198003	**MW-102M**	Total Radium Calculation	265215		
60247198004	**MW-122M**	Total Radium Calculation	265215		
60247198005	**FIELD BLANK**	Total Radium Calculation	265215		

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Sample Condition Upon Receipt

WO#: 60247198

60247198

Client Name: SCS Eng.

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

Tracking #: 7285 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: CF +2.9 T-266 / CF +0.2 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: JJS 6/22/17 1450

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: water	☐Yes ☐No ☑N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☑N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: JJS Date: 6-26-17

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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	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216073	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ 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	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	6/20/17	14:15		2			2							X	X	X		2(BP/N) 15 ↓ 001
2	MW-302	WT	G	xxx	xxx		13:10		2			2							X	X	X		↓ 002
3	~~MW-303~~ VOID	WT	G	xxx	xxx				2			2							X	X	X		Not Sampled
4	MW-102M	WT	G	xxx	xxx	6/21/17	14:25		2			2							X	X	X		2(BP/N) 15 ↓ 003
5	MW-122M	WT	G	xxx	xxx	↓	13:50		2			2							X	X	X		004
6	FIELD BLANK	WT	G	xxx	xxx	6/22/17	14:25		2			2							X	X	X		↓ 005
7																							
8																							
9																							
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.: 60247198

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Grom SCS	6/23/17	25:00		6/23/17	825	4.2	Y	Y	Y
							2.6	Y	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.

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

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 60247198 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 6/23/2017 **Results Requested By:** 7/19/2017

Report To	Subcontract To
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#:30222871

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3						Requested Analysis: 903.1 Radium-226	904.0 Radium-228	Total Radium									LAB USE ONLY
1	MW-301	PS	6/20/2017 14:15	60247198001	Water	2						X	X	X									001
2	MW-302	PS	6/20/2017 13:10	60247198002	Water	2						X	X	X									002
3	MW-102M	PS	6/21/2017 14:25	60247198003	Water	2						X	X	X									003
4	MW-122M	PS	6/21/2017 13:50	60247198004	Water	2						X	X	X									004
5	FIELD BLANK	PS	6/20/2017 14:25	60247198005	Water	2						X	X	X									005

Transfers	Released By	Date/Time	Received	Date/Time
1		6/26/17 1700		6/28/17 1015
2				
3				

Comments

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

EH 6/28/17

****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

Pace Analytical

30222871

ANL

Client Name: PACE - KANSAS Project #

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: 772856595193

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 12/28/17

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: -Includes date/time/ID Matrix: WT				5.
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. PH<2
All containers needing preservation are found to be in compliance with EPA recommendation.	✓			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ZH / 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: ZH / Date: 12/28/17

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 31, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on July 20, 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
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

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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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60249110001	**MW-303**	Water	07/19/17 10:35	07/20/17 08:23
60249110002	**FIELD BLANK**	Water	07/19/17 10:20	07/20/17 08:23

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60249110001	**MW-303**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 9040	HMM	1	PASI-K
		EPA 9056	OL	3	PASI-K
60249110002	**FIELD BLANK**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	SMW	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 Midland LF/25216073
Pace Project No.: 60249110

Sample: MW-303 **Lab ID: 60249110001** Collected: 07/19/17 10:35 Received: 07/20/17 08:23 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		07/19/17 10:35		
Field pH	**7.1**	Std. Units	0.10	0.050	1		07/19/17 10:35		
Field Temperature	**14.5**	deg C	0.50	0.25	1		07/19/17 10:35		
Field Specific Conductance	**1300**	umhos/cm	1.0	1.0	1		07/19/17 10:35		
Field Oxidation Potential	**-83.6**	mV			1		07/19/17 10:35		
Oxygen, Dissolved	**0.5**	mg/L			1		07/19/17 10:35	7782-44-7	
Turbidity	**179.4**	NTU	1.0	1.0	1		07/19/17 10:35		
Groundwater Elevation	**684.92**	feet			1		07/19/17 10:35		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**755**	ug/L	100	3.5	1	07/24/17 10:25	07/27/17 11:18	7440-42-8	
Calcium	**87.7**	mg/L	0.10	0.036	1	07/24/17 10:25	07/27/17 11:18	7440-70-2	
Lithium	**90.8**	ug/L	10.0	2.9	1	07/24/17 10:25	07/27/17 11:18	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.042J**	ug/L	1.0	0.026	1	07/24/17 10:25	07/26/17 01:29	7440-36-0	
Arsenic	**0.59J**	ug/L	1.0	0.052	1	07/24/17 10:25	07/26/17 01:29	7440-38-2	
Barium	**12.8**	ug/L	1.0	0.095	1	07/24/17 10:25	07/26/17 01:29	7440-39-3	
Beryllium	**0.24J**	ug/L	0.50	0.012	1	07/24/17 10:25	07/26/17 01:29	7440-41-7	
Cadmium	**0.019J**	ug/L	0.50	0.018	1	07/24/17 10:25	07/28/17 14:36	7440-43-9	
Chromium	**5.1**	ug/L	1.0	0.054	1	07/24/17 10:25	07/26/17 01:29	7440-47-3	
Cobalt	**2.5**	ug/L	1.0	0.014	1	07/24/17 10:25	07/26/17 01:29	7440-48-4	
Lead	**1.0**	ug/L	1.0	0.033	1	07/24/17 10:25	07/26/17 01:29	7439-92-1	
Molybdenum	**0.26J**	ug/L	1.0	0.058	1	07/24/17 10:25	07/28/17 14:36	7439-98-7	
Selenium	**0.40J**	ug/L	1.0	0.086	1	07/24/17 10:25	07/26/17 01:29	7782-49-2	
Thallium	**0.049J**	ug/L	1.0	0.036	1	07/24/17 10:25	07/26/17 01:29	7440-28-0	B
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.046	1	07/25/17 16:44	07/26/17 10:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**809**	mg/L	5.0	5.0	1		07/24/17 13:59		
9040 pH	Analytical Method: EPA 9040								
pH	**7.0**	Std. Units	0.10	0.10	1		07/25/17 16:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.2**	mg/L	1.0	0.50	1		07/28/17 20:39	16887-00-6	
Fluoride	**0.86**	mg/L	0.20	0.10	1		07/28/17 20:39	16984-48-8	
Sulfate	**255**	mg/L	20.0	10.0	20		07/29/17 15:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

Sample: FIELD BLANK **Lab ID: 60249110002** Collected: 07/19/17 10:20 Received: 07/20/17 08:23 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	07/24/17 10:25	07/27/17 11:21	7440-42-8	
Calcium	ND	mg/L	0.10	0.036	1	07/24/17 10:25	07/27/17 11:21	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	07/24/17 10:25	07/27/17 11:21	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.026	1	07/24/17 10:25	07/26/17 00:41	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	07/24/17 10:25	07/26/17 00:41	7440-38-2	
Barium	ND	ug/L	1.0	0.095	1	07/24/17 10:25	07/26/17 00:41	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	07/24/17 10:25	07/26/17 00:41	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	07/24/17 10:25	07/26/17 00:41	7440-43-9	
Chromium	**0.31J**	ug/L	1.0	0.054	1	07/24/17 10:25	07/26/17 00:41	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	07/24/17 10:25	07/26/17 00:41	7440-48-4	
Lead	ND	ug/L	1.0	0.033	1	07/24/17 10:25	07/26/17 00:41	7439-92-1	
Molybdenum	ND	ug/L	1.0	0.058	1	07/24/17 10:25	07/26/17 00:41	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	07/24/17 10:25	07/26/17 00:41	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	07/24/17 10:25	07/26/17 00:41	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.046	1	07/25/17 16:44	07/26/17 10:56	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		07/24/17 13:59		
9040 pH	Analytical Method: EPA 9040								
pH	**5.8**	Std. Units	0.10	0.10	1		07/25/17 16:08		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**0.68J**	mg/L	1.0	0.50	1		07/28/17 20:55	16887-00-6	B
Fluoride	ND	mg/L	0.20	0.10	1		07/28/17 20:55	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		07/28/17 20:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 486655 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60249110001, 60249110002

METHOD BLANK: 1993449 Matrix: Water
Associated Lab Samples: 60249110001, 60249110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.046	07/26/17 10:20	

LABORATORY CONTROL SAMPLE: 1993450

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.2	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1993451 1993452

Parameter	Units	60249047001 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	0.79	0.80	16	16	75-125	1	20	M1

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 486665
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 60249110001, 60249110002

METHOD BLANK: 1993466 Matrix: Water
Associated Lab Samples: 60249110001, 60249110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	3.5	07/27/17 10:44	
Calcium	mg/L	ND	0.10	0.036	07/27/17 10:44	
Lithium	ug/L	ND	10.0	2.9	07/27/17 10:44	

LABORATORY CONTROL SAMPLE: 1993467

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	982	98	80-120	
Calcium	mg/L	10	9.3	93	80-120	
Lithium	ug/L	1000	1070	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1993468 1993469

Parameter	Units	60248868001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	1000	1000	1110	1080	104	101	75-125	3	20	
Calcium	mg/L	72.3	10	10	82.4	80.3	101	81	75-125	3	20	
Lithium	ug/L	26.0	1000	1000	1140	1130	112	110	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 486433
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Associated Lab Samples: 60249110001, 60249110002

METHOD BLANK: 1992019
Matrix: Water
Associated Lab Samples: 60249110001, 60249110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	07/25/17 23:17	
Arsenic	ug/L	ND	1.0	0.052	07/25/17 23:17	
Barium	ug/L	ND	1.0	0.095	07/25/17 23:17	
Beryllium	ug/L	ND	0.50	0.012	07/25/17 23:17	
Cadmium	ug/L	ND	0.50	0.018	07/25/17 23:17	
Chromium	ug/L	0.24J	1.0	0.054	07/25/17 23:17	
Cobalt	ug/L	ND	1.0	0.014	07/25/17 23:17	
Lead	ug/L	ND	1.0	0.033	07/25/17 23:17	
Molybdenum	ug/L	ND	1.0	0.058	07/25/17 23:17	
Selenium	ug/L	ND	1.0	0.086	07/25/17 23:17	
Thallium	ug/L	0.041J	1.0	0.036	07/25/17 23:17	

LABORATORY CONTROL SAMPLE: 1992020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.5	96	80-120	
Arsenic	ug/L	40	37.4	93	80-120	
Barium	ug/L	40	38.3	96	80-120	
Beryllium	ug/L	40	38.6	96	80-120	
Cadmium	ug/L	40	37.3	93	80-120	
Chromium	ug/L	40	39.4	98	80-120	
Cobalt	ug/L	40	38.8	97	80-120	
Lead	ug/L	40	38.6	97	80-120	
Molybdenum	ug/L	40	40.9	102	80-120	
Selenium	ug/L	40	35.1	88	80-120	
Thallium	ug/L	40	37.0	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1992021 1992022

Parameter	Units	60248889001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	40	40	37.0	36.9	92	92	75-125	0	20	
Arsenic	ug/L	ND	40	40	38.1	38.0	95	95	75-125	0	20	
Barium	ug/L	8.2	40	40	46.3	46.6	95	96	75-125	1	20	
Beryllium	ug/L	ND	40	40	32.4	32.9	81	82	75-125	1	20	
Cadmium	ug/L	ND	40	40	34.4	34.6	86	86	75-125	1	20	
Chromium	ug/L	1.6	40	40	40.0	39.7	96	95	75-125	1	20	
Cobalt	ug/L	ND	40	40	38.1	37.7	93	93	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1992021 1992022

Parameter	Units	60248889001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	36.0	36.0	90	90	75-125	0	20	
Molybdenum	ug/L	47.8	40	40	90.7	90.0	107	106	75-125	1	20	
Selenium	ug/L	1.2	40	40	35.8	36.6	86	88	75-125	2	20	
Thallium	ug/L	ND	40	40	36.6	36.8	91	92	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 486693 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60249110001, 60249110002

METHOD BLANK: 1993529 Matrix: Water
Associated Lab Samples: 60249110001, 60249110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	07/24/17 13:56	

LABORATORY CONTROL SAMPLE: 1993530

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 1993531

Parameter	Units	60249233001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	834	844	1	10	

SAMPLE DUPLICATE: 1993532

Parameter	Units	60249079001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2120	2220	5	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 486926
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Associated Lab Samples: 60249110001, 60249110002

SAMPLE DUPLICATE: 1994299

Parameter	Units	60249132001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	5.8	5.8	0	10	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 487431 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60249110001, 60249110002

METHOD BLANK: 1996230 Matrix: Water
Associated Lab Samples: 60249110001, 60249110002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.65J	1.0	0.50	07/28/17 15:52	
Fluoride	mg/L	ND	0.20	0.10	07/28/17 15:52	
Sulfate	mg/L	ND	1.0	0.50	07/28/17 15:52	

LABORATORY CONTROL SAMPLE: 1996231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	103	80-120	
Fluoride	mg/L	2.5	2.4	95	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1996232 1996233

Parameter	Units	60249086001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	12.8	50	50	55.8	54.8	86	84	80-120	2	15	
Fluoride	mg/L	ND	25	25	24.7	24.8	94	94	80-120	0	15	
Sulfate	mg/L	99.5	50	50	149	148	99	98	80-120	0	15	

SAMPLE DUPLICATE: 1996234

Parameter	Units	60249086002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	ND	74.3J		15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	1700	1710	0	15	

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

QC Batch: 487577 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60249110001

METHOD BLANK: 1996853 Matrix: Water
Associated Lab Samples: 60249110001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	0.50	07/29/17 12:37	

LABORATORY CONTROL SAMPLE: 1996854

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1996855 1996856

Parameter	Units	60249086003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	81.0	25	25	107	107	106	104	80-120	0	15	

SAMPLE DUPLICATE: 1996857

Parameter	Units	60249365035 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	ND	ND		15	

SAMPLE DUPLICATE: 1996858

Parameter	Units	60249365001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.4	14.4	0	15	

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QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249110

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60249110001	**MW-303**		487808		
60249110001	**MW-303**	EPA 3010	486665	EPA 6010	486729
60249110002	**FIELD BLANK**	EPA 3010	486665	EPA 6010	486729
60249110001	**MW-303**	EPA 3010	486433	EPA 6020	486728
60249110002	**FIELD BLANK**	EPA 3010	486433	EPA 6020	486728
60249110001	**MW-303**	EPA 7470	486655	EPA 7470	486978
60249110002	**FIELD BLANK**	EPA 7470	486655	EPA 7470	486978
60249110001	**MW-303**	SM 2540C	486693		
60249110002	**FIELD BLANK**	SM 2540C	486693		
60249110001	**MW-303**	EPA 9040	486926		
60249110002	**FIELD BLANK**	EPA 9040	486926		
60249110001	**MW-303**	EPA 9056	487431		
60249110001	**MW-303**	EPA 9056	487577		
60249110002	**FIELD BLANK**	EPA 9056	487431		

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Sample Condition Upon Receipt

WO# : 60249110

60249110

Client Name: SCS Engineers

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

Tracking #: 7285 6594 1784 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 +2.9 T-266 / CF +0.2 T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.2 **Corr. Factor** CF +2.9 CF +0.2 **Corrected** 2.4

Date and initials of person examining contents: TJ 7/20/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☐Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☐No ☒N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☐Yes ☒No ☐N/A	
Pace containers used:	☐Yes ☒No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: JJS Date: 7-20-17

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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 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	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216073	Pace Profile #:	6696 Line 2

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N								60245100
1	MW-303	WT	G	xxx	xxx	7/14/17	1035		4	2									X	X	X	X	X	X					001		4 OTHR (PH 20)
2	FIELD BLANK	WT	G	xxx	xxx	7/14/17	1020		4	2									X	X	X	X	X	X					002		4 OTHR
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Kyle Kramer	7/14/17	1445	Sandbell pace	7/20/17	0825	2.4	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kyle Kramer

SIGNATURE of SAMPLER: Kyle Kramer DATE Signed (MM/DD/YY): 7/19/17

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

August 07, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on July 20, 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
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60249125001	**MW-303**	Water	07/19/17 10:35	07/20/17 08:25
60249125002	**FIELD BLANK**	Water	07/19/17 10:20	07/20/17 08:25

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60249125001	**MW-303**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60249125002	**FIELD BLANK**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Sample: MW-303 **Lab ID: 60249125001** Collected: 07/19/17 10:35 Received: 07/20/17 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.273 ± 0.736 (1.37) C:NA T:87%**	pCi/L	08/04/17 11:20	13982-63-3	
Radium-228	EPA 904.0	**1.06 ± 0.447 (0.737) C:79% T:86%**	pCi/L	08/04/17 11:22	15262-20-1	
Total Radium	Total Radium Calculation	**1.33 ± 1.18 (2.11)**	pCi/L	08/07/17 14:07	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Sample: FIELD BLANK **Lab ID: 60249125002** Collected: 07/19/17 10:20 Received: 07/20/17 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.181 ± 0.614 (1.36) C:NA T:88%**	pCi/L	08/04/17 11:20	13982-63-3	
Radium-228	EPA 904.0	**0.396 ± 0.361 (0.735) C:75% T:85%**	pCi/L	08/04/17 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**0.396 ± 0.975 (2.10)**	pCi/L	08/07/17 14:07	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

QC Batch: 266556 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60249125001, 60249125002

METHOD BLANK: 1312601 Matrix: Water
Associated Lab Samples: 60249125001, 60249125002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.201 ± 0.283 (0.605) C:76% T:90%	pCi/L	08/04/17 11:18	

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

QC Batch: 266555 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60249125001, 60249125002

METHOD BLANK: 1312600 Matrix: Water
Associated Lab Samples: 60249125001, 60249125002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.072 ± 0.328 (0.774) C:NA T:107%	pCi/L	08/04/17 11:20	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073
Pace Project No.: 60249125

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60249125001	**MW-303**	EPA 903.1	266555		
60249125002	**FIELD BLANK**	EPA 903.1	266555		
60249125001	**MW-303**	EPA 904.0	266556		
60249125002	**FIELD BLANK**	EPA 904.0	266556		
60249125001	**MW-303**	Total Radium Calculation	267528		
60249125002	**FIELD BLANK**	Total Radium Calculation	267528		

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Sample Condition Upon Receipt

WO# : 60249125

60249125

TDG

Client Name: SCS engineers

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

Tracking #: 7285 6594 1800 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 +2.9 CF +0.2 T-266 / T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 26.0 **Corr. Factor** CF +2.9 CF +0.2 **Corrected** 26.2

Date and initials of person examining contents: TB 7/20/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☐No ☒N/A	
Rush Turn Around Time requested:	☐Yes ☐No ☒N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: 7.20.17

CHAIN-OF-CUSTODY / Analytical Request Document

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

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Page: 1 of 1

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	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Midland Landfill	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216073	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ 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	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-303	WT	G	xxx	xxx	7/19/17	1035		2			2							X	X	X		6024 9/25 ZBPIN 001
2	FIELD BLANK	WT	G	xxx	xxx	7/19/17	1020		2			2							X	X	X		002
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Kyle Kramer	7/19/17	1445	Ian Barnett Pace	7/20/17	0825	2.2	N	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kyle Kramer

SIGNATURE of SAMPLER: Kyle Kramer DATE Signed (MM/DD/YY): 7/19/17

*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

WO#: 30224885

30224885

Pace Analytical®
www.pacelabs.com

Workorder: 60249125 **Workorder Name:** Ottumwa Midland LF/25216073 **Owner Received Date:** 7/20/2017 **Results Requested By:** 8/14/2017

Report To	Subcontract To
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: HNO3	903.1 Radium-226	904.0 Radium-228	Total Radium	LAB USE ONLY
1	MW-303	PS	7/19/2017 10:35	60249125001	Water	2	X	X	X	001
2	FIELD BLANK	PS	7/19/2017 10:20	60249125002	Water	2	X	X	X	002
3										
4										
5										

Transfers	Released By	Date/Time	Received	Date/Time
1	[signature]	7/20/17 1700	[signature] Pace	7/21/17 1000
2				
3				

Comments

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

****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

Face Analytical

Client Name: PACE KS Project # 30224885

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label BLM

Tracking #: 7280 0004 4875

LIMS Login BLM

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 7/21/17

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: WT	✓			
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. pH<2
All containers needing preservation are found to be in compliance with EPA recommendation.	✓			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ARM 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: ARM Date: 7/21/17

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.

A8 Round 8 Background Sampling, Analytical Laboratory Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 07, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

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

Enclosures

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

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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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60251677001	**MW-301**	Water	08/22/17 11:15	08/24/17 08:45
60251677002	**MW-302**	Water	08/22/17 14:15	08/24/17 08:45
60251677003	**MW-303**	Water	08/22/17 13:30	08/24/17 08:45
60251677004	**MW-102M**	Water	08/22/17 10:15	08/24/17 08:45
60251677005	**MW-122M**	Water	08/22/17 15:00	08/24/17 08:45
60251677006	**FIELD BLANK**	Water	08/22/17 11:40	08/24/17 08:45

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251677001	**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
60251677002	**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
60251677003	**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
60251677004	**MW-102M**	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
60251677005	**MW-122M**	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
60251677006	**FIELD BLANK**	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 Midland LF/25216073.17
Pace Project No.: 60251677

Sample: MW-301 **Lab ID: 60251677001** Collected: 08/22/17 11:15 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		08/22/17 11:15		
Field pH	**6.51**	Std. Units	0.10	0.050	1		08/22/17 11:15		
Field Temperature	**13.9**	deg C	0.50	0.25	1		08/22/17 11:15		
Field Specific Conductance	**3187**	umhos/cm	1.0	1.0	1		08/22/17 11:15		
Field Oxidation Potential	**-20.6**	mV			1		08/22/17 11:15		
Oxygen, Dissolved	**0.11**	mg/L			1		08/22/17 11:15	7782-44-7	
Turbidity	**0.99**	NTU	1.0	1.0	1		08/22/17 11:15		
Groundwater Elevation	**684.96**	feet			1		08/22/17 11:15		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**994**	ug/L	100	3.5	1	08/29/17 11:25	08/30/17 13:00	7440-42-8	
Calcium	**158**	mg/L	0.10	0.036	1	08/29/17 11:25	08/30/17 13:00	7440-70-2	
Lithium	**114**	ug/L	10.0	2.9	1	08/29/17 11:25	08/30/17 13:00	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.040J**	ug/L	1.0	0.026	1	08/31/17 10:30	09/01/17 10:37	7440-36-0	
Arsenic	**0.56J**	ug/L	1.0	0.052	1	08/31/17 10:30	09/01/17 10:37	7440-38-2	
Barium	**45.7**	ug/L	1.0	0.095	1	08/31/17 10:30	09/01/17 10:37	7440-39-3	
Beryllium	ND	ug/L	0.50	0.012	1	08/31/17 10:30	09/01/17 10:37	7440-41-7	
Cadmium	**0.040J**	ug/L	0.50	0.018	1	08/31/17 10:30	09/01/17 10:37	7440-43-9	
Chromium	**0.20J**	ug/L	1.0	0.054	1	08/31/17 10:30	09/01/17 10:37	7440-47-3	B
Cobalt	**0.17J**	ug/L	1.0	0.014	1	08/31/17 10:30	09/01/17 10:37	7440-48-4	
Lead	**0.091J**	ug/L	1.0	0.033	1	08/31/17 10:30	09/01/17 10:37	7439-92-1	B
Molybdenum	**6.5**	ug/L	1.0	0.058	1	08/31/17 10:30	09/01/17 10:37	7439-98-7	
Selenium	**0.12J**	ug/L	1.0	0.086	1	08/31/17 10:30	09/01/17 10:37	7782-49-2	
Thallium	**0.068J**	ug/L	1.0	0.036	1	08/31/17 10:30	09/01/17 10:37	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 10:56	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1870**	mg/L	5.0	5.0	1		08/26/17 15:32		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		08/29/17 16:33		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**40.8**	mg/L	5.0	2.5	5		09/02/17 17:35	16887-00-6	
Fluoride	**0.78**	mg/L	0.20	0.10	1		09/01/17 19:52	16984-48-8	
Sulfate	**902**	mg/L	100	50.0	100		09/02/17 17:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Sample: MW-302 **Lab ID: 60251677002** Collected: 08/22/17 14:15 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		08/22/17 14:15		
Field pH	**7.12**	Std. Units	0.10	0.050	1		08/22/17 14:15		
Field Temperature	**13.7**	deg C	0.50	0.25	1		08/22/17 14:15		
Field Specific Conductance	**1429**	umhos/cm	1.0	1.0	1		08/22/17 14:15		
Field Oxidation Potential	**-96.2**	mV			1		08/22/17 14:15		
Oxygen, Dissolved	**0.11**	mg/L			1		08/22/17 14:15	7782-44-7	
Turbidity	**77.96**	NTU	1.0	1.0	1		08/22/17 14:15		
Groundwater Elevation	**683.89**	feet			1		08/22/17 14:15		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**783**	ug/L	100	3.5	1	08/29/17 11:25	08/30/17 13:06	7440-42-8	
Calcium	**50.2**	mg/L	0.10	0.036	1	08/29/17 11:25	08/30/17 13:06	7440-70-2	
Lithium	**82.0**	ug/L	10.0	2.9	1	08/29/17 11:25	08/30/17 13:06	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.056J**	ug/L	1.0	0.026	1	08/31/17 10:30	09/01/17 10:50	7440-36-0	
Arsenic	**0.38J**	ug/L	1.0	0.052	1	08/31/17 10:30	09/01/17 10:50	7440-38-2	
Barium	**47.5**	ug/L	1.0	0.095	1	08/31/17 10:30	09/01/17 10:50	7440-39-3	
Beryllium	**0.15J**	ug/L	0.50	0.012	1	08/31/17 10:30	09/01/17 10:50	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/31/17 10:30	09/01/17 10:50	7440-43-9	
Chromium	**2.9**	ug/L	1.0	0.054	1	08/31/17 10:30	09/01/17 10:50	7440-47-3	B
Cobalt	**0.66J**	ug/L	1.0	0.014	1	08/31/17 10:30	09/01/17 10:50	7440-48-4	
Lead	**0.54J**	ug/L	1.0	0.033	1	08/31/17 10:30	09/01/17 10:50	7439-92-1	B
Molybdenum	**0.24J**	ug/L	1.0	0.058	1	08/31/17 10:30	09/01/17 10:50	7439-98-7	B
Selenium	**0.21J**	ug/L	1.0	0.086	1	08/31/17 10:30	09/01/17 10:50	7782-49-2	
Thallium	**0.089J**	ug/L	1.0	0.036	1	08/31/17 10:30	09/01/17 10:50	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 10:58	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**672**	mg/L	5.0	5.0	1		08/26/17 15:33		
9040 pH	Analytical Method: EPA 9040								
pH	**7.4**	Std. Units	0.10	0.10	1		08/29/17 16:35		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**8.5**	mg/L	1.0	0.50	1		09/01/17 20:08	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.10	1		09/01/17 20:08	16984-48-8	
Sulfate	**77.2**	mg/L	5.0	2.5	5		09/02/17 18:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Sample: MW-303 **Lab ID: 60251677003** Collected: 08/22/17 13:30 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 13:30		
Field pH	**6.71**	Std. Units	0.10	0.050	1		08/22/17 13:30		
Field Temperature	**14.0**	deg C	0.50	0.25	1		08/22/17 13:30		
Field Specific Conductance	**1836**	umhos/cm	1.0	1.0	1		08/22/17 13:30		
Field Oxidation Potential	**-72.6**	mV			1		08/22/17 13:30		
Oxygen, Dissolved	**0.31**	mg/L			1		08/22/17 13:30	7782-44-7	
Turbidity	**161.5**	NTU	1.0	1.0	1		08/22/17 13:30		
Groundwater Elevation	**684.70**	feet			1		08/22/17 13:30		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**737**	ug/L	100	3.5	1	08/29/17 11:25	08/30/17 13:09	7440-42-8	
Calcium	**94.0**	mg/L	0.10	0.036	1	08/29/17 11:25	08/30/17 13:09	7440-70-2	
Lithium	**92.8**	ug/L	10.0	2.9	1	08/29/17 11:25	08/30/17 13:09	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.041J**	ug/L	1.0	0.026	1	08/31/17 10:30	09/01/17 10:54	7440-36-0	
Arsenic	**0.53J**	ug/L	1.0	0.052	1	08/31/17 10:30	09/01/17 10:54	7440-38-2	
Barium	**13.1**	ug/L	1.0	0.095	1	08/31/17 10:30	09/01/17 10:54	7440-39-3	
Beryllium	**0.24J**	ug/L	0.50	0.012	1	08/31/17 10:30	09/01/17 10:54	7440-41-7	
Cadmium	**0.026J**	ug/L	0.50	0.018	1	08/31/17 10:30	09/01/17 10:54	7440-43-9	
Chromium	**4.5**	ug/L	1.0	0.054	1	08/31/17 10:30	09/01/17 10:54	7440-47-3	B
Cobalt	**2.1**	ug/L	1.0	0.014	1	08/31/17 10:30	09/01/17 10:54	7440-48-4	
Lead	**1.2**	ug/L	1.0	0.033	1	08/31/17 10:30	09/01/17 10:54	7439-92-1	
Molybdenum	**0.29J**	ug/L	1.0	0.058	1	08/31/17 10:30	09/01/17 10:54	7439-98-7	B
Selenium	**0.42J**	ug/L	1.0	0.086	1	08/31/17 10:30	09/01/17 10:54	7782-49-2	
Thallium	**0.048J**	ug/L	1.0	0.036	1	08/31/17 10:30	09/01/17 10:54	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 11:00	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**868**	mg/L	5.0	5.0	1		08/26/17 15:33		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		08/29/17 16:36		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.3**	mg/L	1.0	0.50	1		09/01/17 20:24	16887-00-6	
Fluoride	**0.85**	mg/L	0.20	0.10	1		09/01/17 20:24	16984-48-8	
Sulfate	**287**	mg/L	20.0	10.0	20		09/02/17 18:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Sample: MW-102M **Lab ID: 60251677004** Collected: 08/22/17 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		08/22/17 10:15		
Field pH	**6.89**	Std. Units	0.10	0.050	1		08/22/17 10:15		
Field Temperature	**13.4**	deg C	0.50	0.25	1		08/22/17 10:15		
Field Specific Conductance	**2751**	umhos/cm	1.0	1.0	1		08/22/17 10:15		
Groundwater Elevation	**713.23**	feet			1		08/22/17 10:15		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1440**	ug/L	100	3.5	1	08/29/17 11:25	08/30/17 13:11	7440-42-8	
Calcium	**79.7**	mg/L	0.10	0.036	1	08/29/17 11:25	08/30/17 13:11	7440-70-2	
Lithium	**54.0**	ug/L	10.0	2.9	1	08/29/17 11:25	08/30/17 13:11	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.16J**	ug/L	1.0	0.026	1	08/31/17 10:30	09/01/17 10:58	7440-36-0	
Arsenic	**0.90J**	ug/L	1.0	0.052	1	08/31/17 10:30	09/01/17 10:58	7440-38-2	
Barium	**31.0**	ug/L	1.0	0.095	1	08/31/17 10:30	09/01/17 10:58	7440-39-3	
Beryllium	**0.41J**	ug/L	0.50	0.012	1	08/31/17 10:30	09/01/17 10:58	7440-41-7	
Cadmium	**0.062J**	ug/L	0.50	0.018	1	08/31/17 10:30	09/01/17 10:58	7440-43-9	
Chromium	**9.6**	ug/L	1.0	0.054	1	08/31/17 10:30	09/01/17 10:58	7440-47-3	
Cobalt	**2.5**	ug/L	1.0	0.014	1	08/31/17 10:30	09/01/17 10:58	7440-48-4	
Lead	**1.8**	ug/L	1.0	0.033	1	08/31/17 10:30	09/01/17 10:58	7439-92-1	
Molybdenum	**9.5**	ug/L	1.0	0.058	1	08/31/17 10:30	09/01/17 10:58	7439-98-7	
Selenium	**0.43J**	ug/L	1.0	0.086	1	08/31/17 10:30	09/01/17 10:58	7782-49-2	
Thallium	**0.067J**	ug/L	1.0	0.036	1	08/31/17 10:30	09/01/17 10:58	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 11:02	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1400**	mg/L	5.0	5.0	1		08/26/17 15:33		
9040 pH	Analytical Method: EPA 9040								
pH	**8.0**	Std. Units	0.10	0.10	1		08/29/17 16:37		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**13.1**	mg/L	1.0	0.50	1		09/01/17 21:13	16887-00-6	
Fluoride	**4.5**	mg/L	0.20	0.10	1		09/01/17 21:13	16984-48-8	
Sulfate	**358**	mg/L	50.0	25.0	50		09/02/17 19:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Sample: MW-122M **Lab ID: 60251677005** Collected: 08/22/17 15:00 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 15:00		
Field pH	**6.32**	Std. Units	0.10	0.050	1		08/22/17 15:00		
Field Temperature	**16.2**	deg C	0.50	0.25	1		08/22/17 15:00		
Field Oxidation Potential	**-7.7**	mV			1		08/22/17 15:00		
Groundwater Elevation	**722.02**	feet			1		08/22/17 15:00		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**4980**	ug/L	1000	35.1	10	08/29/17 11:25	08/30/17 13:20	7440-42-8	
Calcium	**386**	mg/L	1.0	0.36	10	08/29/17 11:25	08/30/17 13:20	7440-70-2	
Lithium	**667**	ug/L	100	29.4	10	08/29/17 11:25	08/30/17 13:20	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	5.0	0.13	5	08/31/17 10:30	09/01/17 11:29	7440-36-0	D3
Arsenic	ND	ug/L	5.0	0.26	5	08/31/17 10:30	09/01/17 11:29	7440-38-2	D3
Barium	**10.3**	ug/L	5.0	0.48	5	08/31/17 10:30	09/01/17 11:29	7440-39-3	B
Beryllium	ND	ug/L	2.5	0.058	5	08/31/17 10:30	09/01/17 11:29	7440-41-7	D3
Cadmium	ND	ug/L	2.5	0.089	5	08/31/17 10:30	09/01/17 11:29	7440-43-9	D3
Chromium	**0.56J**	ug/L	5.0	0.27	5	08/31/17 10:30	09/01/17 11:29	7440-47-3	B
Cobalt	**0.96J**	ug/L	5.0	0.068	5	08/31/17 10:30	09/01/17 11:29	7440-48-4	
Lead	ND	ug/L	5.0	0.16	5	08/31/17 10:30	09/01/17 11:29	7439-92-1	D3
Molybdenum	**0.43J**	ug/L	5.0	0.29	5	08/31/17 10:30	09/01/17 11:29	7439-98-7	B
Selenium	ND	ug/L	5.0	0.43	5	08/31/17 10:30	09/01/17 11:29	7782-49-2	D3
Thallium	ND	ug/L	5.0	0.18	5	08/31/17 10:30	09/01/17 11:29	7440-28-0	D3
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 11:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**14300**	mg/L	5.0	5.0	1		08/26/17 15:33		
9040 pH	Analytical Method: EPA 9040								
pH	**6.0**	Std. Units	0.10	0.10	1		08/29/17 16:38		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.8**	mg/L	1.0	0.50	1		09/01/17 21:29	16887-00-6	
Fluoride	**0.60**	mg/L	0.20	0.10	1		09/01/17 21:29	16984-48-8	
Sulfate	**9190**	mg/L	1000	500	1000		09/02/17 19:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Sample: FIELD BLANK **Lab ID: 60251677006** Collected: 08/22/17 11:40 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	ND	ug/L	100	3.5	1	08/29/17 11:25	08/30/17 12:58	7440-42-8	
Calcium	ND	mg/L	0.10	0.036	1	08/29/17 11:25	08/30/17 12:58	7440-70-2	
Lithium	ND	ug/L	10.0	2.9	1	08/29/17 11:25	08/30/17 12:58	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	ND	ug/L	1.0	0.026	1	08/31/17 10:30	09/01/17 11:11	7440-36-0	
Arsenic	ND	ug/L	1.0	0.052	1	08/31/17 10:30	09/01/17 11:11	7440-38-2	
Barium	**0.14J**	ug/L	1.0	0.095	1	08/31/17 10:30	09/01/17 11:11	7440-39-3	B
Beryllium	ND	ug/L	0.50	0.012	1	08/31/17 10:30	09/01/17 11:11	7440-41-7	
Cadmium	ND	ug/L	0.50	0.018	1	08/31/17 10:30	09/01/17 11:11	7440-43-9	
Chromium	**0.30J**	ug/L	1.0	0.054	1	08/31/17 10:30	09/01/17 11:11	7440-47-3	B
Cobalt	ND	ug/L	1.0	0.014	1	08/31/17 10:30	09/01/17 11:11	7440-48-4	
Lead	**0.079J**	ug/L	1.0	0.033	1	08/31/17 10:30	09/01/17 11:11	7439-92-1	B
Molybdenum	ND	ug/L	1.0	0.058	1	08/31/17 10:30	09/01/17 11:11	7439-98-7	
Selenium	ND	ug/L	1.0	0.086	1	08/31/17 10:30	09/01/17 11:11	7782-49-2	
Thallium	ND	ug/L	1.0	0.036	1	08/31/17 10:30	09/01/17 11:11	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 11:11	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		08/26/17 15:34		
9040 pH	Analytical Method: EPA 9040								
pH	**5.9**	Std. Units	0.10	0.10	1		08/29/17 16:41		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		09/05/17 15:58	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		09/05/17 15:58	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		09/05/17 15:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492571 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

METHOD BLANK: 2015352 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 491932 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

METHOD BLANK: 2013270 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	ND	100	3.5	08/30/17 12:53	
Calcium	mg/L	ND	0.10	0.036	08/30/17 12:53	
Lithium	ug/L	ND	10.0	2.9	08/30/17 12:53	

LABORATORY CONTROL SAMPLE: 2013271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	976	98	80-120	
Calcium	mg/L	10	9.5	95	80-120	
Lithium	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013272 2013273

Parameter	Units	60251677001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	994	1000	1000	2000	2000	101	101	75-125	0	20	
Calcium	mg/L	158	10	10	166	166	83	80	75-125	0	20	
Lithium	ug/L	114	1000	1000	1220	1230	111	111	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492332 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

METHOD BLANK: 2014574 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	0.026	09/01/17 10:28	
Arsenic	ug/L	ND	1.0	0.052	09/01/17 10:28	
Barium	ug/L	0.22J	1.0	0.095	09/01/17 10:28	
Beryllium	ug/L	ND	0.50	0.012	09/01/17 10:28	
Cadmium	ug/L	ND	0.50	0.018	09/01/17 10:28	
Chromium	ug/L	0.55J	1.0	0.054	09/01/17 10:28	
Cobalt	ug/L	0.014J	1.0	0.014	09/01/17 10:28	
Lead	ug/L	0.082J	1.0	0.033	09/01/17 10:28	
Molybdenum	ug/L	0.12J	1.0	0.058	09/01/17 10:28	
Selenium	ug/L	ND	1.0	0.086	09/01/17 10:28	
Thallium	ug/L	ND	1.0	0.036	09/01/17 10:28	

LABORATORY CONTROL SAMPLE: 2014575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.9	97	80-120	
Arsenic	ug/L	40	40.1	100	80-120	
Barium	ug/L	40	38.9	97	80-120	
Beryllium	ug/L	40	40.9	102	80-120	
Cadmium	ug/L	40	40.3	101	80-120	
Chromium	ug/L	40	39.6	99	80-120	
Cobalt	ug/L	40	39.4	98	80-120	
Lead	ug/L	40	39.5	99	80-120	
Molybdenum	ug/L	40	40.3	101	80-120	
Selenium	ug/L	40	39.3	98	80-120	
Thallium	ug/L	40	39.3	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2014576 2014577

Parameter	Units	60251677002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.056J	40	40	35.3	35.9	88	90	75-125	2	20	
Arsenic	ug/L	0.38J	40	40	34.4	34.6	85	86	75-125	1	20	
Barium	ug/L	47.5	40	40	86.1	86.2	96	97	75-125	0	20	
Beryllium	ug/L	0.15J	40	40	35.9	36.0	89	90	75-125	0	20	
Cadmium	ug/L	ND	40	40	32.4	32.6	81	81	75-125	1	20	
Chromium	ug/L	2.9	40	40	38.9	38.4	90	89	75-125	1	20	
Cobalt	ug/L	0.66J	40	40	34.3	34.3	84	84	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2014576 2014577

Parameter	Units	60251677002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.54J	40	40	35.0	35.7	86	88	75-125	2	20	
Molybdenum	ug/L	0.24J	40	40	36.9	37.2	92	92	75-125	1	20	
Selenium	ug/L	0.21J	40	40	31.4	32.0	78	80	75-125	2	20	
Thallium	ug/L	0.089J	40	40	35.9	36.5	90	91	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 491618 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

METHOD BLANK: 2012388 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492059 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005, 60251677006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492586 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005

METHOD BLANK: 2015447 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005

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	

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	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492641 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005

METHOD BLANK: 2015834 Matrix: Water
Associated Lab Samples: 60251677001, 60251677002, 60251677003, 60251677004, 60251677005

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

QC Batch: 492674
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Associated Lab Samples: 60251677006

METHOD BLANK: 2016324
Matrix: Water
Associated Lab Samples: 60251677006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	09/05/17 15:28	
Fluoride	mg/L	ND	0.20	0.10	09/05/17 15:28	
Sulfate	mg/L	ND	1.0	0.50	09/05/17 15:28	

LABORATORY CONTROL SAMPLE: 2016325

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	2.4	96	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2016327 2016328

Parameter	Units	7572827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	17500	10000	10000	29200	28300	117	108	80-120	3	15	
Fluoride	mg/L	ND	5000	5000	5240	5180	105	104	80-120	1	15	
Sulfate	mg/L	ND	10000	10000	10300	10300	103	103	80-120	1	15	

SAMPLE DUPLICATE: 2016326

Parameter	Units	60251677006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	ND	ND		15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	ND	ND		15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

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.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251677001	**MW-301**		493246		
60251677002	**MW-302**		493246		
60251677003	**MW-303**		493246		
60251677004	**MW-102M**		493246		
60251677005	**MW-122M**		493246		
60251677001	**MW-301**	EPA 3010	491932	EPA 6010	492035
60251677002	**MW-302**	EPA 3010	491932	EPA 6010	492035
60251677003	**MW-303**	EPA 3010	491932	EPA 6010	492035
60251677004	**MW-102M**	EPA 3010	491932	EPA 6010	492035
60251677005	**MW-122M**	EPA 3010	491932	EPA 6010	492035
60251677006	**FIELD BLANK**	EPA 3010	491932	EPA 6010	492035
60251677001	**MW-301**	EPA 3010	492332	EPA 6020	492407
60251677002	**MW-302**	EPA 3010	492332	EPA 6020	492407
60251677003	**MW-303**	EPA 3010	492332	EPA 6020	492407
60251677004	**MW-102M**	EPA 3010	492332	EPA 6020	492407
60251677005	**MW-122M**	EPA 3010	492332	EPA 6020	492407
60251677006	**FIELD BLANK**	EPA 3010	492332	EPA 6020	492407
60251677001	**MW-301**	EPA 7470	492571	EPA 7470	492629
60251677002	**MW-302**	EPA 7470	492571	EPA 7470	492629
60251677003	**MW-303**	EPA 7470	492571	EPA 7470	492629
60251677004	**MW-102M**	EPA 7470	492571	EPA 7470	492629
60251677005	**MW-122M**	EPA 7470	492571	EPA 7470	492629
60251677006	**FIELD BLANK**	EPA 7470	492571	EPA 7470	492629
60251677001	**MW-301**	SM 2540C	491618		
60251677002	**MW-302**	SM 2540C	491618		
60251677003	**MW-303**	SM 2540C	491618		
60251677004	**MW-102M**	SM 2540C	491618		
60251677005	**MW-122M**	SM 2540C	491618		
60251677006	**FIELD BLANK**	SM 2540C	491618		
60251677001	**MW-301**	EPA 9040	492059		
60251677002	**MW-302**	EPA 9040	492059		
60251677003	**MW-303**	EPA 9040	492059		
60251677004	**MW-102M**	EPA 9040	492059		
60251677005	**MW-122M**	EPA 9040	492059		
60251677006	**FIELD BLANK**	EPA 9040	492059		
60251677001	**MW-301**	EPA 9056	492586		
60251677001	**MW-301**	EPA 9056	492641		
60251677002	**MW-302**	EPA 9056	492586		
60251677002	**MW-302**	EPA 9056	492641		
60251677003	**MW-303**	EPA 9056	492586		
60251677003	**MW-303**	EPA 9056	492641		
60251677004	**MW-102M**	EPA 9056	492586		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251677

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251677004	**MW-102M**	EPA 9056	492641		
60251677005	**MW-122M**	EPA 9056	492586		
60251677005	**MW-122M**	EPA 9056	492641		
60251677006	**FIELD BLANK**	EPA 9056	492674		

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Sample Condition Upon Receipt

WO#: 60251677

60251677

Client Name: SCS Engr

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

Tracking #: 8677 7481 2727 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 0.0 T-266 / CF +0.3 T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 1.0 **Corr. Factor** CF 0.0 CF +0.3 **Corrected** 1.0

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

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒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: DAL Date: 8-24-17

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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:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073.17

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
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): 6010 Total Metals: B-Ca-Li = N; 6020 Total Metals * = N; 7470 Total Hg = N

Pace Project No./ Lab I.D.: 60251677

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	8-22-17	11:15	13.9	3	1		2						X	X	X	X	X	X		BP2u (2) BP3N 01
2	MW-302	WT	G	xxx	xxx	8-22-17	14:15	13.7	3	1		2						X	X	X	X	X	X		02
3	MW-303	WT	G	xxx	xxx	8-22-17	13:30	14.0	3	1		2						X	X	X	X	X	X		03
4	MW-102M	WT	G	xxx	xxx	8-22-17	10:15	13.4	3	1		2						X	X	X	X	X	X		04
5	MW-122M	WT	G	xxx	xxx	8-22-17	15:00	14.0	3	1		2						X	X	X	X	X	X		05
6	FIELD BLANK	WT	G	xxx	xxx	8-22-17	11:40	—	3	1		2						X	X	X	X	X	X		06
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	[signature]	8-23-17	14:50	[signature]	8/24/17	0845	1.0	Y	Y	Y
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

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.

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

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September 19, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

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

Enclosures

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

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CERTIFICATIONS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

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

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SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60251679001	**MW-301**	Water	08/22/17 11:15	08/24/17 08:45
60251679002	**MW-302**	Water	08/22/17 14:15	08/24/17 08:45
60251679003	**MW-303**	Water	08/22/17 13:30	08/24/17 08:45
60251679004	**MW-102M**	Water	08/22/17 10:15	08/24/17 08:45
60251679005	**MW-122M**	Water	08/22/17 15:00	08/24/17 08:45
60251679006	**FIELD BLANK**	Water	08/22/17 11:40	08/24/17 08:45
60251679007	**MW-122M**	Water	08/23/17 08:30	08/24/17 08:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251679001	**MW-301**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251679002	**MW-302**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251679003	**MW-303**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251679004	**MW-102M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251679005	**MW-122M**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60251679006	**FIELD BLANK**	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: MW-301 **Lab ID: 60251679001** Collected: 08/22/17 11:15 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	**0.600 ± 0.556 (0.846) C:NA T:88%**	pCi/L	09/08/17 19:54	13982-63-3	
Radium-228	EPA 904.0	**0.896 ± 0.417 (0.698) C:72% T:85%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**1.50 ± 0.973 (1.54)**	pCi/L	09/19/17 08:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: MW-302 **Lab ID: 60251679002** Collected: 08/22/17 14:15 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	**1.74 ± 0.813 (0.878) C:NA T:79%**	pCi/L	09/08/17 19:54	13982-63-3	
Radium-228	EPA 904.0	**0.863 ± 0.413 (0.700) C:73% T:84%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**2.60 ± 1.23 (1.58)**	pCi/L	09/19/17 08:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: MW-303 **Lab ID: 60251679003** Collected: 08/22/17 13:30 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	**0.559 ± 0.506 (0.745) C:NA T:88%**	pCi/L	09/08/17 19:54	13982-63-3	
Radium-228	EPA 904.0	**0.244 ± 0.329 (0.702) C:77% T:76%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**0.803 ± 0.835 (1.45)**	pCi/L	09/19/17 08:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: MW-102M **Lab ID: 60251679004** Collected: 08/22/17 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	**0.368 ± 0.382 (0.569) C:NA T:84%**	pCi/L	09/08/17 19:54	13982-63-3	
Radium-228	EPA 904.0	**0.226 ± 0.334 (0.720) C:74% T:79%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**0.594 ± 0.716 (1.29)**	pCi/L	09/19/17 08:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: MW-122M **Lab ID: 60251679005** Collected: 08/22/17 15:00 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	**0.559 ± 0.584 (0.823) C:NA T:91%**	pCi/L	09/08/17 20:08	13982-63-3	
Radium-228	EPA 904.0	**0.532 ± 0.431 (0.853) C:73% T:80%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**1.09 ± 1.02 (1.68)**	pCi/L	09/19/17 08:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Sample: FIELD BLANK **Lab ID: 60251679006** Collected: 08/22/17 11:40 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	**0.0595 ± 0.387 (0.780) C:NA T:86%**	pCi/L	09/08/17 20:08	13982-63-3	
Radium-228	EPA 904.0	**-0.107 ± 0.332 (0.797) C:78% T:77%**	pCi/L	09/12/17 11:23	15262-20-1	
Total Radium	Total Radium Calculation	**0.0595 ± 0.719 (1.58)**	pCi/L	09/19/17 08:29	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

QC Batch: 270011 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60251679001, 60251679002, 60251679003, 60251679004, 60251679005, 60251679006

METHOD BLANK: 1328713 Matrix: Water
Associated Lab Samples: 60251679001, 60251679002, 60251679003, 60251679004, 60251679005, 60251679006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.249 ± 0.380 (0.821) C:77% T:73%	pCi/L	09/12/17 11:20	

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

QC Batch: 270001 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60251679001, 60251679002, 60251679003, 60251679004, 60251679005, 60251679006

METHOD BLANK: 1328689 Matrix: Water
Associated Lab Samples: 60251679001, 60251679002, 60251679003, 60251679004, 60251679005, 60251679006

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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60251679

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251679001	**MW-301**	EPA 903.1	270001		
60251679002	**MW-302**	EPA 903.1	270001		
60251679003	**MW-303**	EPA 903.1	270001		
60251679004	**MW-102M**	EPA 903.1	270001		
60251679005	**MW-122M**	EPA 903.1	270001		
60251679006	**FIELD BLANK**	EPA 903.1	270001		
60251679001	**MW-301**	EPA 904.0	270011		
60251679002	**MW-302**	EPA 904.0	270011		
60251679003	**MW-303**	EPA 904.0	270011		
60251679004	**MW-102M**	EPA 904.0	270011		
60251679005	**MW-122M**	EPA 904.0	270011		
60251679006	**FIELD BLANK**	EPA 904.0	270011		
60251679001	**MW-301**	Total Radium Calculation	272135		
60251679002	**MW-302**	Total Radium Calculation	272135		
60251679003	**MW-303**	Total Radium Calculation	272135		
60251679004	**MW-102M**	Total Radium Calculation	272135		
60251679005	**MW-122M**	Total Radium Calculation	272135		
60251679006	**FIELD BLANK**	Total Radium Calculation	272136		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60251679

60251679

Client Name: SCS

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

Tracking #: 8677 7489 2716 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 0.0 T-266 / CF +0.3 T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 16.2 **Corr. Factor** CF 0.0 0 CF +0.3 **Corrected** 16.2

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

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: W	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☑N/A	
Cyanide water sample checks: ☐ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☐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: JMS 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: 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:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073.17

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

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60251679
1	MW-301	WT	G	xxx	xxx	8-22-17	11:15	13.9	2			2							X	X	X		2BPIN 01
2	MW-302	WT	G	xxx	xxx	↓	14:15	13.7	2			2							X	X	X		02
3	MW-303	WT	G	xxx	xxx	↓	13:30	14.0	2			2							X	X	X		03
4	MW-102M	WT	G	xxx	xxx	8-22-17	10:15	13.9	2			2							X	X	X		↓ 04
5	MW-122M	WT	G	xxx	xxx	8-22-17	15:00	14.0	2			2							X	X VOID	X		1 BPIN 05
6	FIELD BLANK	WT	G	xxx	xxx	8-22-17	11:40		2			2							X	X	X		2 BPIN 006
7	MW-122M	WT	G			8-23-17	8:30	14.0												X			1 BPIN 07
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul H. Snow SCS	8-23-17	14:50	[signature]	8/24/17	0845	16.2	N	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.

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

Chain of Custody

Pace Analytical®
www.pacelabs.com

Workorder: 60251679 **Workorder Name:** Ottumwa Midland LF/25216073.17 **Owner Received Date:** 8/24/2017 **Results Requested By:** 9/19/2017

Report To	Subcontract To
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#:30228485

30228485

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: HNO3	903.1 Radium-226	904.0 Radium-228	Total Radium	LAB USE ONLY
1	MW-301	PS	8/22/2017 11:15	60251679001	Water	2	X	X	X	001
2	MW-302	PS	8/22/2017 14:15	60251679002	Water	2	X	X	X	002
3	MW-303	PS	8/22/2017 13:30	60251679003	Water	2	X	X	X	003
4	MW-102M	PS	8/22/2017 10:15	60251679004	Water	2	X	X	X	004
5	MW-122M	PS	8/22/2017 15:00	60251679005	Water	1	X	X	X	005
6	FIELD BLANK	PS	8/22/2017 11:40	60251679006	Water	2	X	X	X	006

Transfers	Released By	Date/Time	Received	Date/Time
1	[signature]	8/23/17 1700	[signature]	8/24/17 1030
2				
3				

Comments

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

30228485 –

Pace Analytical

Client Name: PACE, KS Project #

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Label ZH
LIMS Login AMV

Tracking #: 777856059611981

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 8/29/17

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: -Includes date/time/ID Matrix: WT	–			5.
Samples Arrived within Hold Time:	–			6.
Short Hold Time Analysis (<72hr remaining):		–		7.
Rush Turn Around Time Requested:		–		8.
Sufficient Volume:	–			9. Low Volume sample 005
Correct Containers Used: -Pace Containers Used:	–			10.
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. All containers needing preservation are found to be in compliance with EPA recommendation.	–			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed ZH; 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: ZH Date: 8/29/17

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution: Recieved 2 containers for Sample ID: MW-122M
Project #'s: 60251679-005 and 60251679-007
Collected at: (08/22/17 ; 15:00) and (8/23/17 ; 08:30)
received 007 in error

☐ **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.

A9 Fall 2017 Detection Sampling, Analytical Laboratory Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 22, 2017

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

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

Enclosures

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60257718001	**MW-301**	Water	11/07/17 13:25	11/10/17 08:30
60257718002	**MW-302**	Water	11/07/17 14:55	11/10/17 08:30
60257718003	**MW-303**	Water	11/07/17 15:30	11/10/17 08:30
60257718004	**MW-102M**	Water	11/08/17 08:40	11/10/17 08:30
60257718005	**MW-122M**	Water	11/08/17 09:00	11/10/17 08:30
60257718006	**FIELD BLANK**	Water	11/07/17 14:10	11/10/17 08:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60257718001	**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
60257718002	**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
60257718003	**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
60257718004	**MW-102M**	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
60257718005	**MW-122M**	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
60257718006	**FIELD BLANK**	EPA 6010	TDS	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 9040	JSS	1	PASI-K
		EPA 9056	JMC1	3	PASI-K

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: MW-301 **Lab ID: 60257718001** Collected: 11/07/17 13:25 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		11/07/17 13:25		
Field pH	**6.56**	Std. Units	0.10	0.050	1		11/07/17 13:25		
Field Temperature	**13.4**	deg C	0.50	0.25	1		11/07/17 13:25		
Field Specific Conductance	**2395**	umhos/cm	1.0	1.0	1		11/07/17 13:25		
Field Oxidation Potential	**144.3**	mV			1		11/07/17 13:25		
Oxygen, Dissolved	**0.37**	mg/L			1		11/07/17 13:25	7782-44-7	
Turbidity	**1.91**	NTU	1.0	1.0	1		11/07/17 13:25		
Groundwater Elevation	**684.50**	feet			1		11/07/17 13:25		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1010**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:25	7440-42-8	
Calcium	**161**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:25	7440-70-2	M1
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1760**	mg/L	5.0	5.0	1		11/14/17 18:01		
9040 pH	Analytical Method: EPA 9040								
pH	**6.4**	Std. Units	0.10	0.10	1		11/13/17 16:17		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**28.9**	mg/L	2.0	1.0	2		11/21/17 14:31	16887-00-6	
Fluoride	**0.77**	mg/L	0.20	0.10	1		11/18/17 21:21	16984-48-8	
Sulfate	**926**	mg/L	100	50.0	100		11/21/17 15:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: MW-302 **Lab ID: 60257718002** Collected: 11/07/17 14:55 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		11/07/17 14:55		
Field pH	**7.41**	Std. Units	0.10	0.050	1		11/07/17 14:55		
Field Temperature	**13.1**	deg C	0.50	0.25	1		11/07/17 14:55		
Field Specific Conductance	**1079**	umhos/cm	1.0	1.0	1		11/07/17 14:55		
Field Oxidation Potential	**112.3**	mV			1		11/07/17 14:55		
Oxygen, Dissolved	**0.30**	mg/L			1		11/07/17 14:55	7782-44-7	
Turbidity	**202.4**	NTU	1.0	1.0	1		11/07/17 14:55		
Groundwater Elevation	**683.38**	feet			1		11/07/17 14:55		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**848**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:32	7440-42-8	
Calcium	**74.0**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:32	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**607**	mg/L	5.0	5.0	1		11/14/17 18:02		
9040 pH	Analytical Method: EPA 9040								
pH	**7.2**	Std. Units	0.10	0.10	1		11/13/17 16:22		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.8**	mg/L	1.0	0.50	1		11/18/17 22:04	16887-00-6	
Fluoride	**1.2**	mg/L	0.20	0.10	1		11/18/17 22:04	16984-48-8	
Sulfate	**77.5**	mg/L	5.0	2.5	5		11/21/17 16:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: MW-303 **Lab ID: 60257718003** Collected: 11/07/17 15:30 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		11/07/17 15:30		
Field pH	**6.96**	Std. Units	0.10	0.050	1		11/07/17 15:30		
Field Temperature	**13.2**	deg C	0.50	0.25	1		11/07/17 15:30		
Field Specific Conductance	**1307**	umhos/cm	1.0	1.0	1		11/07/17 15:30		
Field Oxidation Potential	**125.7**	mV			1		11/07/17 15:30		
Oxygen, Dissolved	**0.45**	mg/L			1		11/07/17 15:30	7782-44-7	
Turbidity	**258.2**	NTU	1.0	1.0	1		11/07/17 15:30		
Groundwater Elevation	**684.26**	feet			1		11/07/17 15:30		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**738**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:34	7440-42-8	
Calcium	**94.9**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:34	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**783**	mg/L	5.0	5.0	1		11/14/17 18:02		
9040 pH	Analytical Method: EPA 9040								
pH	**6.8**	Std. Units	0.10	0.10	1		11/13/17 16:23		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**6.9**	mg/L	1.0	0.50	1		11/18/17 22:33	16887-00-6	
Fluoride	**0.77**	mg/L	0.20	0.10	1		11/18/17 22:33	16984-48-8	
Sulfate	**232**	mg/L	20.0	10.0	20		11/21/17 16:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: MW-102M **Lab ID: 60257718004** Collected: 11/08/17 08:40 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 08:40		
Field pH	**8.16**	Std. Units	0.10	0.050	1		11/08/17 08:40		
Field Temperature	**12.9**	deg C	0.50	0.25	1		11/08/17 08:40		
Field Specific Conductance	**2085**	umhos/cm	1.0	1.0	1		11/08/17 08:40		
Field Oxidation Potential	**219.9**	mV			1		11/08/17 08:40		
Oxygen, Dissolved	**0.73**	mg/L			1		11/08/17 08:40	7782-44-7	
Groundwater Elevation	**713.53**	feet			1		11/08/17 08:40		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1480**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:37	7440-42-8	
Calcium	**10.4**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:37	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1410**	mg/L	5.0	5.0	1		11/14/17 18:24		
9040 pH	Analytical Method: EPA 9040								
pH	**7.8**	Std. Units	0.10	0.10	1		11/13/17 16:25		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**12.3**	mg/L	1.0	0.50	1		11/18/17 22:47	16887-00-6	
Fluoride	**4.6**	mg/L	0.20	0.10	1		11/18/17 22:47	16984-48-8	
Sulfate	**335**	mg/L	50.0	25.0	50		11/21/17 17:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: MW-122M **Lab ID: 60257718005** Collected: 11/08/17 09:00 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 09:00		
Field pH	**6.16**	Std. Units	0.10	0.050	1		11/08/17 09:00		
Field Temperature	**13.1**	deg C	0.50	0.25	1		11/08/17 09:00		
Field Specific Conductance	**13375**	umhos/cm	1.0	1.0	1		11/08/17 09:00		
Field Oxidation Potential	**195.4**	mV			1		11/08/17 09:00		
Oxygen, Dissolved	**0.49**	mg/L			1		11/08/17 09:00	7782-44-7	
Groundwater Elevation	**720.52**	feet			1		11/08/17 09:00		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**5220**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:39	7440-42-8	
Calcium	**383**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:39	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**13400**	mg/L	5.0	5.0	1		11/14/17 18:24		
9040 pH	Analytical Method: EPA 9040								
pH	**6.2**	Std. Units	0.10	0.10	1		11/13/17 16:26		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**7.2**	mg/L	1.0	0.50	1		11/18/17 23:02	16887-00-6	
Fluoride	**0.50**	mg/L	0.20	0.10	1		11/18/17 23:02	16984-48-8	
Sulfate	**9440**	mg/L	1000	500	1000		11/21/17 17:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Sample: FIELD BLANK **Lab ID: 60257718006** Collected: 11/07/17 14:10 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	**11.6J**	ug/L	100	3.5	1	11/15/17 10:20	11/15/17 17:42	7440-42-8	
Calcium	**0.069J**	mg/L	0.10	0.036	1	11/15/17 10:20	11/15/17 17:42	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	5.0	5.0	1		11/14/17 18:04		
9040 pH	Analytical Method: EPA 9040								
pH	**5.1**	Std. Units	0.10	0.10	1		11/13/17 16:20		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	ND	mg/L	1.0	0.50	1		11/21/17 17:35	16887-00-6	
Fluoride	ND	mg/L	0.20	0.10	1		11/21/17 17:35	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		11/21/17 17:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 503267 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005, 60257718006

METHOD BLANK: 2060296 Matrix: Water
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005, 60257718006

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	

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	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2060298 2060299

Parameter	Units	60257718001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 503086 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718006

METHOD BLANK: 2059690 Matrix: Water
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	11/14/17 18:00	

LABORATORY CONTROL SAMPLE: 2059691

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	993	99	80-120	

SAMPLE DUPLICATE: 2059692

Parameter	Units	60257838004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	853	900	5	10	

SAMPLE DUPLICATE: 2059693

Parameter	Units	60257854005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	499	497	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 503088 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60257718004, 60257718005

METHOD BLANK: 2059699 Matrix: Water
Associated Lab Samples: 60257718004, 60257718005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	11/14/17 18:20	

LABORATORY CONTROL SAMPLE: 2059700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2059701

Parameter	Units	60257854017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	587	552	6	10	

SAMPLE DUPLICATE: 2059999

Parameter	Units	60257954005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	404	439	8	10	

SAMPLE DUPLICATE: 2060000

Parameter	Units	60257955002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	728	52	10	D6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 502970 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005, 60257718006

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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 503806 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005

METHOD BLANK: 2062941 Matrix: Water
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005

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	

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	

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	RPD	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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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

QC Batch: 504269 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005, 60257718006

METHOD BLANK: 2065478 Matrix: Water
Associated Lab Samples: 60257718001, 60257718002, 60257718003, 60257718004, 60257718005, 60257718006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	11/21/17 14:02	
Fluoride	mg/L	ND	0.20	0.10	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	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2065480 2065481

Parameter	Units	60257718001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

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

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Midland LF/25216073.17
Pace Project No.: 60257718

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60257718001	**MW-301**		503905		
60257718002	**MW-302**		503905		
60257718003	**MW-303**		503905		
60257718004	**MW-102M**		503905		
60257718005	**MW-122M**		503905		
60257718001	**MW-301**	EPA 3010	503267	EPA 6010	503383
60257718002	**MW-302**	EPA 3010	503267	EPA 6010	503383
60257718003	**MW-303**	EPA 3010	503267	EPA 6010	503383
60257718004	**MW-102M**	EPA 3010	503267	EPA 6010	503383
60257718005	**MW-122M**	EPA 3010	503267	EPA 6010	503383
60257718006	**FIELD BLANK**	EPA 3010	503267	EPA 6010	503383
60257718001	**MW-301**	SM 2540C	503086		
60257718002	**MW-302**	SM 2540C	503086		
60257718003	**MW-303**	SM 2540C	503086		
60257718004	**MW-102M**	SM 2540C	503088		
60257718005	**MW-122M**	SM 2540C	503088		
60257718006	**FIELD BLANK**	SM 2540C	503086		
60257718001	**MW-301**	EPA 9040	502970		
60257718002	**MW-302**	EPA 9040	502970		
60257718003	**MW-303**	EPA 9040	502970		
60257718004	**MW-102M**	EPA 9040	502970		
60257718005	**MW-122M**	EPA 9040	502970		
60257718006	**FIELD BLANK**	EPA 9040	502970		
60257718001	**MW-301**	EPA 9056	503806		
60257718001	**MW-301**	EPA 9056	504269		
60257718002	**MW-302**	EPA 9056	503806		
60257718002	**MW-302**	EPA 9056	504269		
60257718003	**MW-303**	EPA 9056	503806		
60257718003	**MW-303**	EPA 9056	504269		
60257718004	**MW-102M**	EPA 9056	503806		
60257718004	**MW-102M**	EPA 9056	504269		
60257718005	**MW-122M**	EPA 9056	503806		
60257718005	**MW-122M**	EPA 9056	504269		
60257718006	**FIELD BLANK**	EPA 9056	504269		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO# : 60257718

60257718

Client Name: SCS Engineering

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

Tracking #: 7285 6597 9159 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 0.0) T-266 / (CF +0.2) T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 1.2 Corr. Factor (CF 0.0 CF +0.2) Corrected 1.2

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

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☑ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑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: 11.10.17

Pace Analytical
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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:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Midland Landfill
Project Number:	25216073.17

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

Requested Analysis Filtered (Y/N)

ITEM #	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 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: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																				Y/N	N	N	N	N		60257718
1	MW-301		WT	G	xxx	xxx	11-7-17	13:25	13.1	2	1		1								X	X	X	X		BP3N, BP2U 001
2	MW-302		WT	G	xxx	xxx	11-7-17	14.55	13.1	2	1		1								X	X	X	X		002
3	MW-303		WT	G	xxx	xxx	11-7-17	15:30	13.2	2	1		1								X	X	X	X		003
4	MW-102M		WT	G	xxx	xxx	11-8-17	9:40	12.9	2	1		1								X	X	X	X		004
5	MW-122M		WT	G	xxx	xxx	11-8-17	9:05	13.1	2	1		1								X	X	X	X		005
6	FIELD BLANK		WT	G	xxx	xxx	11-7-17	14:10	—	2	1		1								X	X	X	X		006
7																										
8																										
9																										
10																										
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. Grace SCS	11-9-17	16:30		11/10	0830	1.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
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.

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