



HALEY & ALDRICH, INC.
6500 Rockside Road
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Cleveland, OH 44131
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31 January 2018
File No. 129778-003

Westar Energy, Inc.
818 South Kansas Avenue
Topeka, Kansas 66612

Attention: Jared Morrison
Manager, Water and Waste Programs

Subject: 2017 Annual Groundwater Monitoring and Corrective Action Report for Ash Landfill 847
Lawrence Energy Center
Lawrence, Kansas

Dear Mr. Morrison:

Haley & Aldrich, Inc. is pleased to submit this Annual Groundwater Monitoring and Corrective Action Report (Annual Report) for the Ash Landfill 847 at the Lawrence Energy Center (LEC). This Annual Report was developed in accordance with the United States Environmental Protection Agency CCR Rule effective 19 October 2015 (Rule), specifically Code of Federal Regulations Title 40, subsection § 257.90(e). The Annual Report documents the design and construction of the groundwater monitoring system for the Ash Landfill 847 consistent with applicable sections of § 257.90 through 257.98.

This Annual Report describes activities conducted in the prior calendar year and documents compliance with the Rule. The specific requirements listed in Sections § 257.90(e)(1)-(5) of the Rule are provided in bold/italic type, followed by a short narrative describing how the Rule has been met.

Sincerely yours,
HALEY & ALDRICH, INC.

A handwritten signature in blue ink, appearing to read "Steve Putrich".

Steve Putrich, P.E.
Project Principal

A handwritten signature in blue ink, appearing to read "Mark Nicholls".

Mark Nicholls, P.G.
Lead Hydrogeologist

2017 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
ASH LANDFILL 847
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Westar Energy, Inc.
Topeka, Kansas

File No. 129778-003
January 2018



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1. 40 CFR § 257.90 Applicability

1.1 40 CFR § 257.90(a)

Except as provided for in §257.100 for inactive CCR surface impoundments, all CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under §257.90 through 257.98.

The Ash Landfill 847 at the Lawrence Energy Center (LEC), which is the coal combustion residuals (CCR) management unit addressed in this Annual Groundwater Monitoring and Corrective Action Report (Annual Report), is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) § 257.90 through 257.98. In particular, this document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e) (Rule).

1.2 40 CFR § 257.90(e)

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).

This Annual Report is the initial report for the LEC Ash Landfill 847 as required by the Rule as the groundwater monitoring system was established and certified by 17 October 2017. Prior to 17 October 2017, Westar installed a groundwater monitoring system at the Ash Landfill 847 consistent with § 257.91. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 is provided in this report. This Annual Report documents the activities completed in the calendar year 2017.

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

- (1) 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;***

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the Ash Landfill 847 is included in this report as Figure 1. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report prepared for Westar, which was placed in the facility's operating record by 17 October 2017 as required by § 257.105(h)(2).

(2) 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;

The design and construction of the monitoring well network for the Ash Landfill 847 at LEC are described in the CCR Groundwater Monitoring Network Description Report dated 17 October 2017. This report was placed in the facility's operating record by 17 October 2017, as required by § 257.105(h)(2). Since the groundwater monitoring system was certified, no new monitoring wells were installed or decommissioned.

(3) 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;

In accordance with § 257.94(b), eight independent samples from each background and downgradient monitoring well were collected prior to 17 October 2017. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the Ash Landfill 847 is presented in Table I of this report. In 2017, the groundwater monitoring sampling and laboratory analyses were completed under the detection monitoring program.

(4) 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); and

Detection monitoring was conducted in accordance with § 257.94(b), and no transitions between monitoring programs occurred for the Ash Landfill 847 in calendar year 2017.

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

This initial Annual Report documents activities conducted to comply with § 257.90 through § 257.94 of the Rule. It is understood that there are supplemental references in § 257.90 through § 257.98 to information that must be placed in the Annual Report; however, none of the activities referenced as required in the Annual Report are relevant to the groundwater monitoring program for activities completed in calendar year 2017.

1.3 40 CFR § 257.90(f)

The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(h), the notification requirements specified in § 257.106(h), and the internet requirements specified in § 257.107(h).

To comply with the Rule recordkeeping requirements:

- Pursuant to § 257.105(h)(1), this Annual Report must be placed in the facility's operating record.
- Pursuant to § 257.106(h)(1), notification must be sent to the relevant State Director and/or Tribal authority within 30 days of this Annual Report being placed on the facility's operating record [§ 257.106(d)].
- Pursuant to § 257.107(h)(1), this Annual Report must be posted to the Westar CCR Website within 30 days of this Annual Report being placed on the facility's operating record [§ 257.107(d)].




TABLES

FIGURES

GIS FILE PATH: \\haleyaldrich.com\share\phx_common\Projects\Westar\Lawrence Energy Center (LEC)\GIS\MXDs\2016_06_SAPLEC_MW_LOCA_MAP_REV1.mxd — USER: lbruce — LAST SAVED: 1/30/2018 4:57:16 PM

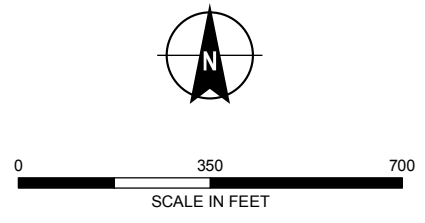


LEGEND

-  MONITORING WELL
-  ASH LANDFILL ACTIVE AREA
-  ASH LANDFILL LIMITS OF DISPOSAL AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2015.



HALEY ALDRICH WESTAR ENERGY
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

**ASH LANDFILL 847 MONITORING
WELL LOCATION MAP**

JANUARY 2018
SCALE: AS SHOWN

FIGURE 1

October 7, 2022
Project No. 0204993-000



TO: Evergy Kansas Central, Inc.
Jared Morrison – Director, Water and Waste Programs

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

SUBJECT: 2017 Annual Groundwater Monitoring and Corrective Action Report Addendum
Evergy Kansas Central, Inc. (Evergy)
847 Landfill
Lawrence Energy Center – Lawrence, Kansas

The Evergy Kansas Central, Inc. (Evergy) 847 Landfill at the Lawrence Energy Center is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) §257.90 through §257.98 (Rule). An Annual Groundwater Monitoring and Corrective Action (GWMCA) Report documenting the activities completed in 2017 for the 847 Landfill was completed and placed in the facility’s operating record on January 31, 2018, as required by the Rule. The Annual GWMCA Report contained the specific information listed in 40 CFR §257.90(e).

This report addendum has been prepared to supplement the operating record in recognition of comments received by Evergy from the U.S. Environmental Protection Agency (USEPA) on January 11, 2022. In addition to the information listed in 40 CFR §257.90(e), the USEPA indicated in their comments that the GWMCA Report should contain:

- Results of laboratory analysis of groundwater or other environmental media samples for the presence of constituents of Appendices III and IV to 40 CFR Part 257 (or of other constituents, such as those supporting characterization of site conditions that may ultimately affect a remedy);
- Required statistical analyses performed on those (laboratory analysis) results;
- Measured groundwater elevations; and
- Calculated groundwater flow rate and direction.

While this information is not specifically referred to in 40 CFR §257.90(e) for inclusion in the GWMCA Reports, it has been routinely collected and maintained in Evergy’s files and is being provided in the attachments to this addendum. The applicable laboratory analysis reports for baseline sampling events in 2016 and 2017 are included in Attachment 1. Since no statistical analyses were completed in 2017, there were no analyses to report in this addendum. For each of the 2017 sampling events, the measured groundwater elevations, with calculated groundwater flow rates and directions, have been included in Attachment 2.

The attachments to this addendum are as follows providing the additional information:

- Attachment 1 – Laboratory Analytical Reports: Includes laboratory data packages with supporting information such as case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation. The laboratory data packages for the background sampling events completed in August, September, October, and December 2016, and February, March, April, May, June, July, and August 2017 are provided.
 - Groundwater sampling and analysis was completed at monitoring well MW-36 during baseline groundwater monitoring; however, the monitoring well was not included in the final certified network design established in October 2017. Therefore, MW-36 laboratory analytical data is included in many of these laboratory analytical reports.
- Attachment 2 – Groundwater Potentiometric Maps: Includes the measured groundwater elevations at each well and the generalized groundwater flow direction and calculated flow rate. Maps for the sampling events completed in August, September, October, and December 2016, and February, April, May, and June 2017 are provided.

ATTACHMENT 1
Laboratory Analytical Reports

ATTACHMENT 1-1
August 2016 Sampling Event
Laboratory Analytical Report

September 12, 2016

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60225865

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 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,



Heather Wilson
heather.wilson@pacelabs.com
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

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

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

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60225865001	MW-34-081616	Water	08/16/16 11:44	08/17/16 16:25
60225865002	MW-32-081616	Water	08/16/16 14:42	08/17/16 16:25
60225865003	MW-31R-081716	Water	08/17/16 08:09	08/17/16 16:25
60225865004	MW-33-081716	Water	08/17/16 09:34	08/17/16 16:25
60225865005	DUP-081616	Water	08/16/16 13:25	08/17/16 16:25
60225865006	MW-31R-081716 MS	Water	08/17/16 08:09	08/17/16 16:25
60225865007	MW-31R-081716 MSD	Water	08/17/16 08:09	08/17/16 16:25

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60225865001	MW-34-081616	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
60225865002	MW-32-081616	EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
60225865003	MW-31R-081716	SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60225865004	MW-33-081716	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	AB1	1	PASI-PA
60225865005	DUP-081616	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		EPA 904.0	JLW	1	PASI-PA
		EPA 245.1	ZBM	1	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 200.7	JGP	7	PASI-K
		EPA 300.0	OL	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60225865006	MW-31R-081716 MS	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60225865007	MW-31R-081716 MSD	EPA 903.1	AB1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-34-081616		Lab ID: 60225865001		Collected: 08/16/16 11:44	Received: 08/17/16 16:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.18	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:13	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/22/16 16:30	08/23/16 11:13	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:13	7440-42-8	
Calcium, Total Recoverable	230	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:13	7440-70-2	
Chromium, Total Recoverable	0.011	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:13	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:13	7439-92-1	
Lithium	0.19	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:13	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7440-36-0	
Arsenic, Total Recoverable	0.0029	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/19/16 11:30	08/22/16 13:02	7440-43-9	
Cobalt, Total Recoverable	0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7440-48-4	
Molybdenum, Total Recoverable	0.0082	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:02	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.20	ug/L	0.20	1	08/19/16 09:40	08/19/16 12:54	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	9000	mg/L	5.0	1		08/22/16 14:37		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.8	Std. Units	0.10	1		08/19/16 11:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	5440	mg/L	1000	1000		09/06/16 13:18	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		09/03/16 20:47	16984-48-8	
Sulfate	456	mg/L	50.0	50		09/06/16 13:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-32-081616		Lab ID: 60225865002	Collected: 08/16/16 14:42	Received: 08/17/16 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.32	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:16	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/22/16 16:30	08/23/16 11:16	7440-41-7	
Boron, Total Recoverable	0.18	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:16	7440-42-8	
Calcium, Total Recoverable	59.2	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:16	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:16	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:16	7439-92-1	
Lithium	0.012	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:16	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/19/16 11:30	08/22/16 13:15	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7440-48-4	
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:15	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.20	ug/L	0.20	1	08/19/16 09:40	08/19/16 12:56	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	480	mg/L	5.0	1		08/22/16 14:38		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		08/19/16 11:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	93.2	mg/L	10.0	10		09/06/16 13:32	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		09/03/16 21:01	16984-48-8	
Sulfate	9.1	mg/L	1.0	1		09/03/16 21:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-31R-081716	Lab ID: 60225865003	Collected: 08/17/16 08:09	Received: 08/17/16 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.18	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:20	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/22/16 16:30	08/23/16 11:20	7440-41-7	
Boron, Total Recoverable	0.71	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:20	7440-42-8	
Calcium, Total Recoverable	214	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:20	7440-70-2	M1
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:20	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:20	7439-92-1	
Lithium	0.12	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:20	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/19/16 11:30	08/22/16 13:28	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7440-48-4	
Molybdenum, Total Recoverable	0.012	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:28	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.20	ug/L	0.20	1	08/19/16 09:40	08/19/16 12:58	7439-97-6	M1
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	8200	mg/L	5.0	1		08/23/16 14:24		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		08/19/16 14:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	4150	mg/L	500	500		09/06/16 14:44	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		09/03/16 21:15	16984-48-8	M1
Sulfate	173	mg/L	20.0	20		09/06/16 14:15	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-33-081716		Lab ID: 60225865004		Collected: 08/17/16 09:34	Received: 08/17/16 16:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.16	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:32	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/22/16 16:30	08/23/16 11:32	7440-41-7	
Boron, Total Recoverable	1.5	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:32	7440-42-8	
Calcium, Total Recoverable	250	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:32	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:32	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:32	7439-92-1	
Lithium	0.19	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:32	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7440-36-0	
Arsenic, Total Recoverable	0.0011	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/19/16 11:30	08/22/16 13:41	7440-43-9	
Cobalt, Total Recoverable	0.0020	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7440-48-4	
Molybdenum, Total Recoverable	0.0091	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:41	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.20	ug/L	0.20	1	08/19/16 09:40	08/19/16 13:05	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	13200	mg/L	5.0	1		08/23/16 14:25		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		08/19/16 14:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	8700	mg/L	1000	1000		09/06/16 15:27	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		09/03/16 21:44	16984-48-8	
Sulfate	462	mg/L	50.0	50		09/06/16 15:13	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: DUP-081616		Lab ID: 60225865005	Collected: 08/16/16 13:25	Received: 08/17/16 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.19	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:36	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/22/16 16:30	08/23/16 11:36	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:36	7440-42-8	
Calcium, Total Recoverable	228	mg/L	0.10	1	08/22/16 16:30	08/23/16 11:36	7440-70-2	
Chromium, Total Recoverable	0.0084	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:36	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	08/22/16 16:30	08/23/16 11:36	7439-92-1	
Lithium	0.19	mg/L	0.010	1	08/22/16 16:30	08/23/16 11:36	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7440-36-0	
Arsenic, Total Recoverable	0.0027	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	08/19/16 11:30	08/22/16 13:50	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7440-48-4	
Molybdenum, Total Recoverable	0.0081	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	08/19/16 11:30	08/22/16 13:50	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.20	ug/L	0.20	1	08/19/16 09:40	08/19/16 13:07	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	9500	mg/L	5.0	1		08/22/16 14:39		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.8	Std. Units	0.10	1		08/19/16 11:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	5550	mg/L	500	500		09/06/16 15:56	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		09/03/16 22:28	16984-48-8	
Sulfate	496	mg/L	50.0	50		09/06/16 15:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 443413 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

METHOD BLANK: 1813293 Matrix: Water
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.20	0.20	08/19/16 12:23	

LABORATORY CONTROL SAMPLE: 1813294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	85-115	

MATRIX SPIKE SAMPLE: 1813295

Parameter	Units	60225836010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	4.6	91	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1813296 1813297

Parameter	Units	60225865003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.20	5	5	2.2	2.3	44	45	70-130	4	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60225865

QC Batch: 443713 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

METHOD BLANK: 1814601 Matrix: Water
Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.010	0.010	08/23/16 10:28	
Beryllium	mg/L	<0.0010	0.0010	08/23/16 10:28	
Boron	mg/L	<0.10	0.10	08/23/16 10:28	
Calcium	mg/L	<0.10	0.10	08/23/16 10:28	
Chromium	mg/L	<0.0050	0.0050	08/23/16 10:28	
Lead	mg/L	<0.0050	0.0050	08/23/16 10:28	
Lithium	mg/L	<0.010	0.010	08/23/16 10:28	

LABORATORY CONTROL SAMPLE: 1814602

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	102	85-115	
Beryllium	mg/L	1	1.0	101	85-115	
Boron	mg/L	1	0.99	99	85-115	
Calcium	mg/L	10	10.0	100	85-115	
Chromium	mg/L	1	1.0	104	85-115	
Lead	mg/L	1	1.1	106	85-115	
Lithium	mg/L	1	1.0	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1814603 1814604

Parameter	Units	60226099002		1814604		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	547 ug/L	1	1	1.6	1.6	104	103	70-130	1	20
Beryllium	mg/L	<1.0 ug/L	1	1	1.0	1.0	102	101	70-130	1	20
Boron	mg/L	658 ug/L	1	1	1.7	1.7	105	104	70-130	1	20
Calcium	mg/L	288000 ug/L	10	10	304	298	152	96	70-130	2	20 M1
Chromium	mg/L	<5.0 ug/L	1	1	1.0	1.0	103	103	70-130	0	20
Lead	mg/L	<5.0 ug/L	1	1	0.99	0.99	99	98	70-130	1	20
Lithium	mg/L	57.8 ug/L	1	1	1.1	1.1	104	103	70-130	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1814605 1814606

Parameter	Units	60225865003		1814606		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.18	1	1	1.2	1.2	100	100	70-130	0	20

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1814605												1814606	
Parameter	Units	60225865003 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Beryllium	mg/L	<0.0010	1	1	1.0	1.0	102	101	70-130	1	20		
Boron	mg/L	0.71	1	1	1.7	1.7	102	102	70-130	0	20		
Calcium	mg/L	214	10	10	216	216	21	19	70-130	0	20	M1	
Chromium	mg/L	<0.0050	1	1	1.0	1.0	105	104	70-130	1	20		
Lead	mg/L	<0.0050	1	1	0.95	0.95	95	95	70-130	0	20		
Lithium	mg/L	0.12	1	1	1.2	1.2	106	105	70-130	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1814607												1814608	
Parameter	Units	60226141001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Barium	mg/L	<0.010	1	1	1.0	1.0	100	102	70-130	1	20		
Beryllium	mg/L	<0.0010	1	1	1.0	1.0	100	101	70-130	1	20		
Boron	mg/L	1.2	1	1	2.2	2.3	104	109	70-130	2	20		
Calcium	mg/L	290	10	10	300	303	92	129	70-130	1	20		
Chromium	mg/L	<0.0050	1	1	1.0	1.0	104	104	70-130	0	20		
Lead	mg/L	<0.0050	1	1	1.0	1.0	100	100	70-130	0	20		
Lithium	mg/L	0.089	1	1	1.1	1.1	103	105	70-130	2	20		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 443487 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

METHOD BLANK: 1813606 Matrix: Water
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	08/22/16 12:23	
Arsenic	mg/L	<0.0010	0.0010	08/22/16 12:23	
Cadmium	mg/L	<0.00050	0.00050	08/22/16 12:23	
Cobalt	mg/L	<0.0010	0.0010	08/22/16 12:23	
Molybdenum	mg/L	<0.0010	0.0010	08/22/16 12:23	
Selenium	mg/L	<0.0010	0.0010	08/22/16 12:23	
Thallium	mg/L	<0.0010	0.0010	08/22/16 12:23	

LABORATORY CONTROL SAMPLE: 1813607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.041	104	85-115	
Arsenic	mg/L	.04	0.043	107	85-115	
Cadmium	mg/L	.04	0.042	106	85-115	
Cobalt	mg/L	.04	0.042	105	85-115	
Molybdenum	mg/L	.04	0.043	108	85-115	
Selenium	mg/L	.04	0.043	106	85-115	
Thallium	mg/L	.04	0.039	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1813608 1813609

Parameter	Units	60225865003		60225865004		MSD		MS		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MSD Result	MSD Result	% Rec	% Rec					
Antimony	mg/L	<0.0010	.04	.04	0.037	0.038	90	92	70-130	2	20		
Arsenic	mg/L	<0.0010	.04	.04	0.034	0.035	84	86	70-130	2	20		
Cadmium	mg/L	<0.00050	.04	.04	0.031	0.031	76	78	70-130	2	20		
Cobalt	mg/L	<0.0010	.04	.04	0.033	0.034	83	84	70-130	2	20		
Molybdenum	mg/L	0.012	.04	.04	0.053	0.054	104	105	70-130	1	20		
Selenium	mg/L	<0.0010	.04	.04	0.030	0.031	75	77	70-130	3	20		
Thallium	mg/L	<0.0010	.04	.04	0.033	0.034	82	85	70-130	3	20		

SAMPLE DUPLICATE: 1814599

Parameter	Units	60225865004 Result	Dup Result	RPD	Max RPD	Qualifiers
Antimony	mg/L	<0.0010	<0.0010		20	
Arsenic	mg/L	0.0011	0.0012	6	20	
Cadmium	mg/L	<0.00050	<0.00050		20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

SAMPLE DUPLICATE: 1814599

Parameter	Units	60225865004 Result	Dup Result	RPD	Max RPD	Qualifiers
Cobalt	mg/L	0.0020	0.0020	1	20	
Molybdenum	mg/L	0.0091	0.0089	2	20	
Selenium	mg/L	<0.0010	<0.0010		20	
Thallium	mg/L	<0.0010	<0.0010		20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 443671

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60225865001, 60225865002, 60225865005

METHOD BLANK: 1814513

Matrix: Water

Associated Lab Samples: 60225865001, 60225865002, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/22/16 14:19	

LABORATORY CONTROL SAMPLE: 1814514

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	955	96	80-120	

SAMPLE DUPLICATE: 1814515

Parameter	Units	60225792001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	7800	7700	1	10	

SAMPLE DUPLICATE: 1814516

Parameter	Units	60226029009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	726	718	1	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch:	443884	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60225865003, 60225865004		

METHOD BLANK: 1815159 Matrix: Water

Associated Lab Samples: 60225865003, 60225865004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/23/16 14:20	

LABORATORY CONTROL SAMPLE: 1815160

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	978	98	80-120	

SAMPLE DUPLICATE: 1815161

Parameter	Units	60225865003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8200	8400	2	10	

SAMPLE DUPLICATE: 1815162

Parameter	Units	60225902002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	293	298	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 443415 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60225865001, 60225865002, 60225865005

SAMPLE DUPLICATE: 1813300

Parameter	Units	60224594001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.3	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 443526 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60225865003, 60225865004

SAMPLE DUPLICATE: 1813925

Parameter	Units	60225865003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 445129

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

METHOD BLANK: 1820002

Matrix: Water

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	09/03/16 17:11	
Sulfate	mg/L	<1.0	1.0	09/03/16 17:11	

LABORATORY CONTROL SAMPLE: 1820003

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1820004 1820005

Parameter	Units	60226324001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Fluoride	mg/L	ND	2.5	2.5	2.5	2.5	99	99	80-120	0	15	
Sulfate	mg/L	14.8	5	5	19.4	19.4	91	91	80-120	0	15	

MATRIX SPIKE SAMPLE: 1820006

Parameter	Units	60225865003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	<0.20	2.5	1.5	59	80-120	M1

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 445332 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

METHOD BLANK: 1820980 Matrix: Water
 Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/06/16 09:27	
Sulfate	mg/L	<1.0	1.0	09/06/16 09:27	

LABORATORY CONTROL SAMPLE: 1820981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Sulfate	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1820982 1820983

Parameter	Units	60226507001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Chloride	mg/L	3.0	5	5	7.8	7.8	95	95	80-120	0	15	
Sulfate	mg/L	1.0	5	5	5.8	5.8	96	96	80-120	0	15	

MATRIX SPIKE SAMPLE: 1820984

Parameter	Units	60225865003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4150	2500	6680	102	80-120	
Sulfate	mg/L	173	100	266	94	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-34-081616 **Lab ID: 60225865001** Collected: 08/16/16 11:44 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	8.20 ± 1.85 (0.968) C:NA T:86%	pCi/L	09/12/16 13:24	13982-63-3	
Radium-228	EPA 904.0	2.93 ± 0.734 (0.655) C:84% T:81%	pCi/L	09/08/16 21:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-32-081616 **Lab ID: 60225865002** Collected: 08/16/16 14:42 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	5.20 ± 1.31 (0.484) C:NA T:98%	pCi/L	09/12/16 13:25	13982-63-3	
Radium-228	EPA 904.0	9.95 ± 1.98 (0.669) C:79% T:82%	pCi/L	09/08/16 21:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-31R-081716 **Lab ID: 60225865003** Collected: 08/17/16 08:09 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	8.64 ± 1.79 (1.07) C:NA T:62%	pCi/L	09/12/16 13:33	13982-63-3	
Radium-228	EPA 904.0	12.8 ± 2.47 (0.624) C:83% T:81%	pCi/L	09/08/16 21:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-33-081716 **Lab ID: 60225865004** Collected: 08/17/16 09:34 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	6.68 ± 1.58 (0.977) C:NA T:86%	pCi/L	09/12/16 13:26	13982-63-3	
Radium-228	EPA 904.0	16.4 ± 3.13 (0.681) C:78% T:80%	pCi/L	09/08/16 21:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: DUP-081616 **Lab ID: 60225865005** Collected: 08/16/16 13:25 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	4.74 ± 1.26 (0.961) C:NA T:83%	pCi/L	09/12/16 13:44	13982-63-3	
Radium-228	EPA 904.0	9.04 ± 1.82 (0.702) C:81% T:83%	pCi/L	09/08/16 21:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-31R-081716 MS **Lab ID: 60225865006** Collected: 08/17/16 08:09 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	109.95 %REC ± NA (NA) C:NA T:NA	pCi/L	09/12/16 13:21	13982-63-3	
Radium-228	EPA 904.0	148 %REC +/- NA (NA) C:NA T:NA	pCi/L	09/08/16 21:51	15262-20-1	1e

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Sample: MW-31R-081716 MSD **Lab ID: 60225865007** Collected: 08/17/16 08:09 Received: 08/17/16 16:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	108.32 %REC 1.49 RPD ± NA (NA) C:NA T:NA	pCi/L	09/12/16 13:46	13982-63-3	
Radium-228	EPA 904.0	102 %REC 36.8 RPD +/- NA (NA) C:NA T:NA	pCi/L	09/08/16 21:51	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 231667 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005, 60225865006, 60225865007

METHOD BLANK: 1135313 Matrix: Water

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005, 60225865006, 60225865007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.543 ± 0.326 (0.589) C:81% T:84%	pCi/L	09/08/16 21:51	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60225865

QC Batch: 231666

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005, 60225865006, 60225865007

METHOD BLANK: 1135308

Matrix: Water

Associated Lab Samples: 60225865001, 60225865002, 60225865003, 60225865004, 60225865005, 60225865006, 60225865007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.372 ± 0.439 (0.691) C:NA T:92%	pCi/L	09/12/16 13:08	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60225865

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

1e The % recovery for the Ra-228 matrix spike performed on sample 60225865006 was high and outside of Pace's default acceptance criteria at 147.47%. The high bias may be due to sample matrix interference and indicate a high bias in the sample result.

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: LEC CCR Groundwater

Pace Project No.: 60225865

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60225865001	MW-34-081616	EPA 200.7	443713	EPA 200.7	443793
60225865002	MW-32-081616	EPA 200.7	443713	EPA 200.7	443793
60225865003	MW-31R-081716	EPA 200.7	443713	EPA 200.7	443793
60225865004	MW-33-081716	EPA 200.7	443713	EPA 200.7	443793
60225865005	DUP-081616	EPA 200.7	443713	EPA 200.7	443793
60225865001	MW-34-081616	EPA 200.8	443487	EPA 200.8	443517
60225865002	MW-32-081616	EPA 200.8	443487	EPA 200.8	443517
60225865003	MW-31R-081716	EPA 200.8	443487	EPA 200.8	443517
60225865004	MW-33-081716	EPA 200.8	443487	EPA 200.8	443517
60225865005	DUP-081616	EPA 200.8	443487	EPA 200.8	443517
60225865001	MW-34-081616	EPA 245.1	443413	EPA 245.1	443454
60225865002	MW-32-081616	EPA 245.1	443413	EPA 245.1	443454
60225865003	MW-31R-081716	EPA 245.1	443413	EPA 245.1	443454
60225865004	MW-33-081716	EPA 245.1	443413	EPA 245.1	443454
60225865005	DUP-081616	EPA 245.1	443413	EPA 245.1	443454
60225865001	MW-34-081616	EPA 903.1	231666		
60225865002	MW-32-081616	EPA 903.1	231666		
60225865003	MW-31R-081716	EPA 903.1	231666		
60225865004	MW-33-081716	EPA 903.1	231666		
60225865005	DUP-081616	EPA 903.1	231666		
60225865006	MW-31R-081716 MS	EPA 903.1	231666		
60225865007	MW-31R-081716 MSD	EPA 903.1	231666		
60225865001	MW-34-081616	EPA 904.0	231667		
60225865002	MW-32-081616	EPA 904.0	231667		
60225865003	MW-31R-081716	EPA 904.0	231667		
60225865004	MW-33-081716	EPA 904.0	231667		
60225865005	DUP-081616	EPA 904.0	231667		
60225865006	MW-31R-081716 MS	EPA 904.0	231667		
60225865007	MW-31R-081716 MSD	EPA 904.0	231667		
60225865001	MW-34-081616	SM 2540C	443671		
60225865002	MW-32-081616	SM 2540C	443671		
60225865003	MW-31R-081716	SM 2540C	443884		
60225865004	MW-33-081716	SM 2540C	443884		
60225865005	DUP-081616	SM 2540C	443671		
60225865001	MW-34-081616	SM 4500-H+B	443415		
60225865002	MW-32-081616	SM 4500-H+B	443415		
60225865003	MW-31R-081716	SM 4500-H+B	443526		
60225865004	MW-33-081716	SM 4500-H+B	443526		
60225865005	DUP-081616	SM 4500-H+B	443415		
60225865001	MW-34-081616	EPA 300.0	445129		
60225865001	MW-34-081616	EPA 300.0	445332		
60225865002	MW-32-081616	EPA 300.0	445129		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60225865

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60225865002	MW-32-081616	EPA 300.0	445332		
60225865003	MW-31R-081716	EPA 300.0	445129		
60225865003	MW-31R-081716	EPA 300.0	445332		
60225865004	MW-33-081716	EPA 300.0	445129		
60225865004	MW-33-081716	EPA 300.0	445332		
60225865005	DUP-081616	EPA 300.0	445129		
60225865005	DUP-081616	EPA 300.0	445332		

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Sample Condition Upon Receipt

WO#: 60225865
Barcode
60225865

Client Name: Westar Energy
Courier: FedEx [] UPS [] VIA [] Clay [] PEX [] ECI [] Pace [] Other [] Client []
Tracking #:
Custody Seal on Cooler/Box Present: Yes [] No [] Seals intact: Yes [] No []
Packing Material: Bubble Wrap [] Bubble Bags [] Foam [] None [] Other []
Thermometer Used: T-266 T-239
Cooler Temperature: 4.1/3.2
Type of Ice: Wet Blue None [] Samples received on ice, cooling process has begun.

Optional
Proj Due Date:
Proj Name:

Date and initials of person examining contents: 8/17/16

Table with 18 rows and 2 columns. Row 1: Chain of Custody present: [] Yes [] No [] N/A 1. Row 2: Chain of Custody filled out: [] Yes [] No [] N/A 2. Row 3: Chain of Custody relinquished: [] Yes [] No [] N/A 3. Row 4: Sampler name & signature on COC: [] Yes [] No [] N/A 4. Row 5: Samples arrived within holding time: [] Yes [] No [] N/A 5. Row 6: Short Hold Time analyses (<72hr): [] Yes [] No [] N/A 6. Row 7: Rush Turn Around Time requested: [] Yes [] No [] N/A 7. Row 8: Sufficient volume: [] Yes [] No [] N/A 8. Row 9: Correct containers used: [] Yes [] No [] N/A 9. Row 10: Pace containers used: [] Yes [] No [] N/A 10. Row 11: Containers intact: [] Yes [] No [] N/A 10. Row 12: Unpreserved 5035A soils frozen w/in 48hrs? [] Yes [] No [] N/A 11. Row 13: Filtered volume received for dissolved tests? [] Yes [] No [] N/A 12. Row 14: Sample labels match COC: [] Yes [] No [] N/A 13. Row 15: Includes date/time/ID/analyses Matrix: wt 13. Row 16: All containers needing preservation have been checked. [] Yes [] No [] N/A 14. Row 17: All containers needing preservation are found to be in compliance with EPA recommendation. [] Yes [] No [] N/A 14. Row 18: Exceptions: VOA, Coliform, O&G, WI-DRO (water) [] Yes [] No 14. Row 19: Trip Blank present: [] Yes [] No [] N/A 15. Row 20: Pace Trip Blank lot # (if purchased): 15. Row 21: Headspace in VOA vials (>6mm): [] Yes [] No [] N/A 16. Row 22: Project sampled in USDA Regulated Area: [] Yes [] No [] N/A 17. List State: 17. Row 23: 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: 8/18/16



CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A

Required Client Information:
Company: WESTAR ENERGY
Address: 818 Kansas Ave
Topeka, KS 66612
Email To: brandon.l.griffin@westarenergy.com
Phone: (785) 575-8135 Fax:
Requested Due Date/TAT: 7 DAY

Section B

Required Project Information:
Report To: Brandon Griffin
Copy To: Jared Morrison, Heath Horyna
Purchase Order No.:
Project Name: LEC CCR Groundwater
Project Number:

Section C

Invoice Information:
Attention: Jared Morrison
Company Name: WESTAR ENERGY
Address: SEE SECTION A
Pace Quote Reference:
Pace Project Manager: Heather Wilson, 913-563-1407
Pace Profile #: 9655, 1

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER _____

Site Location
STATE: KS

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 /, -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Y/N ↓	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		MATRIX CODE				COMPOSITE		Unpreserved	H ₂ SO ₄			HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	↓ Analysis Test ↓	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Mercury		300.0 Cl, F, SO ₄	4500 H+B	2540C TDS	Radium 226	Radium 228							
		DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	CODE			START	END/GRAB																					DATE	TIME	DATE	TIME			
1	MW-34-081616			WT G	G			8/16/16	1144	4	1	3															822U, B93N 2(B91N) 2.0							
2	MW-32-081616			WT G	G			8/16/16	144 2	4	1	3															↓ ↓ ↓							
3	MW-31R-081716			WT G	G			8/17/16	0809	4	1	3															↓ ↓ ↓							
4	MW-31R-081716 MS/MSD			WT G	G			8/17/16	0809	4	1	3															↓ ↓ ↓							
5	MW-33-081716			WT G	G			8/17/16	0934	4	1	3															↓ ↓ ↓							
6																																		
7																																		
8																																		
9																																		
10	DUP-081616			WT G	G			8/16/16	1325	4	1	3															↓ ↓ ↓							
11																																		
12																																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
	200.7 Total Metals: Ba, Be, B, Ca, Cr, Pb, Li	BWG / westar	8/17/16	1035	Shelby McClellan	8/17/16	1625	4.1	X	4	4
	**200.6 Total Metals: Co, As, Se, Mo, Cd, Cr, Tl							3.2			
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: Brandon Griffin											
SIGNATURE of SAMPLER: BWG						DATE Signed (MM/DD/YY): 08/17/16					

*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#: 30193973



30193973



Workorder: 60225865

Workorder Name: LEC CCR Groundwater

Owner Received Date: 8/17/2016 Results Requested By: 9/9/2016

Report To		Subcontract To				Requested Analysis														
Heather Wilson 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																		
							Preserved Containers					Radium 226 & 228								LAB USE ONLY
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Bp/IN														
1	MW-34-081616	PS	8/16/2016 11:44	60225865001	Water	2											001			
2	MW-32-081616	PS	8/16/2016 14:42	60225865002	Water	2											002			
3	MW-31R-081716	RQS	8/17/2016 08:09	60225865003	Water	4											MS/MSD 003			
4	MW-33-081716	PS	8/17/2016 09:34	60225865004	Water	2											004			
5	DUP-081616	PS	8/16/2016 13:25	60225865005	Water	2											005			
6	MW-31R-081716 MS		8/17/06 08:09	60225865006	Water	2											006			
7	MW-31R-081716 MSD		8/17/16 08:09	60225865007	Water	2										007				
												Comments								
Transfers	Released By	Date/Time	Received	Date/Time																
1			<i>[Signature]</i>	8/13/16	0930 <i>[Handwritten]</i>															
2				8/19/16	0930 <i>[Handwritten]</i>															
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.

Chain of Custody

50193973



Workorder: 60225865

Workorder Name: LEC CCR Groudwater

Owner Received Date: 8/17/2016 Results Requested By: 9/9/2016

Report To		Subcontract To					Requested Analysis													
Heather Wilson 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																		
							Preserved Containers					Radium 226 & 228								LAB USE ONLY
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Bp/IN														
1	MW-34-081616	PS	8/16/2016 11:44	60225865001	Water	2														
2	MW-32-081616	PS	8/16/2016 14:42	60225865002	Water	2														
3	MW-31R-081716	RQS	8/17/2016 08:09	60225865003	Water	24													ms/msd	
4	MW-33-081716	PS	8/17/2016 09:34	60225865004	Water	2														
5	DUP-081616	PS	8/16/2016 13:25	60225865005	Water	2														
Transfers												Comments								
Released By	Date/Time	Received	Date/Time																	
<i>[Signature]</i>	8/16/16	<i>[Signature]</i>	8/16/16																	
Cooler Temperature on Receipt °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

30193973



Client Name: Pace KS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 6703 1647 8476

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: RTB 8/23/16

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:	X			5.
-Includes date/time/ID/Analysis Matrix: <u>WT</u>				
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:	X			10.
-Pace Containers Used:	X			
Containers Intact:	X			11.
Filtered volume received for Dissolved tests			X	12.
All containers needing preservation have been checked.	X			13.
All containers needing preservation are found to be in compliance with EPA recommendation.	X			<u>pH < 2</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>8/23/16 RTB</u> 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: <u>RTB</u> Date: <u>8/23/16</u>

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.

ATTACHMENT 1-2
September 2016 Sampling Event
Laboratory Analytical Report

October 14, 2016

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60228264

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 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,



Colleen Clyne for
Heather Wilson
heather.wilson@pacelabs.com
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60228264001	MW-32-091916	Water	09/19/16 10:16	09/21/16 16:40
60228264002	MW-31R-091916	Water	09/19/16 11:37	09/21/16 16:40
60228264003	MW-33-091916	Water	09/19/16 12:40	09/21/16 16:40
60228264004	MW-34-091916	Water	09/19/16 14:07	09/21/16 16:40
60228264005	DUP-091916	Water	09/19/16 08:00	09/21/16 16:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60228264001	MW-32-091916	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
60228264002	MW-31R-091916	EPA 300.0	OL	3	PASI-K
		EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
60228264003	MW-33-091916	SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60228264004	MW-34-091916	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	SMW	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60228264005	DUP-091916	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		EPA 904.0	JLW	1	PASI-PA
		EPA 245.1	NDJ	1	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 200.7	SMW	7	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater
Pace Project No.: 60228264

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-32-091916		Lab ID: 60228264001		Collected: 09/19/16 10:16		Received: 09/21/16 16:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.30	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:05	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	09/28/16 17:05	7440-41-7		
Boron, Total Recoverable	0.18	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:05	7440-42-8		
Calcium, Total Recoverable	59.5	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:05	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:05	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:05	7439-92-1		
Lithium	0.012	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:05	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	09/23/16 12:00	10/10/16 13:00	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7440-48-4		
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:00	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	09/26/16 13:00	09/27/16 10:38	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	497	mg/L	5.0	1		09/25/16 20:26			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.6	Std. Units	0.10	1		09/27/16 12:40		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	94.6	mg/L	10.0	10		10/13/16 22:26	16887-00-6		
Fluoride	0.23	mg/L	0.20	1		10/13/16 21:58	16984-48-8		
Sulfate	8.6	mg/L	1.0	1		10/13/16 21:58	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-31R-091916		Lab ID: 60228264002		Collected: 09/19/16 11:37		Received: 09/21/16 16:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.20	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:07	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	09/28/16 17:07	7440-41-7		
Boron, Total Recoverable	0.68	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:07	7440-42-8		
Calcium, Total Recoverable	214	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:07	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:07	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:07	7439-92-1		
Lithium	0.12	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:07	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:21	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:21	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	09/23/16 12:00	10/10/16 13:21	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:21	7440-48-4		
Molybdenum, Total Recoverable	0.010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:21	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:21	7782-49-2		
Thallium, Total Recoverable	<0.0020	mg/L	0.0020	2	09/23/16 12:00	10/10/16 14:35	7440-28-0	D3	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	09/26/16 13:00	09/27/16 10:40	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	8200	mg/L	5.0	1		09/25/16 20:29			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.4	Std. Units	0.10	1		09/27/16 12:40		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<1.0	mg/L	1.0	1		10/13/16 22:55	16887-00-6		
Fluoride	0.60	mg/L	0.20	1		10/13/16 22:55	16984-48-8		
Sulfate	166	mg/L	20.0	20		10/13/16 23:09	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-33-091916		Lab ID: 60228264003		Collected: 09/19/16 12:40		Received: 09/21/16 16:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.16	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:10	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	09/28/16 17:10	7440-41-7		
Boron, Total Recoverable	1.7	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:10	7440-42-8		
Calcium, Total Recoverable	259	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:10	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:10	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:10	7439-92-1		
Lithium	0.21	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:10	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0020	mg/L	0.0020	2	09/23/16 12:00	10/10/16 14:18	7440-36-0	D3	
Arsenic, Total Recoverable	0.0015	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:26	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	09/23/16 12:00	10/10/16 13:26	7440-43-9		
Cobalt, Total Recoverable	0.0020	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:26	7440-48-4		
Molybdenum, Total Recoverable	0.0083	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:26	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:26	7782-49-2		
Thallium, Total Recoverable	<0.0020	mg/L	0.0020	2	09/23/16 12:00	10/10/16 14:18	7440-28-0	D3	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	09/26/16 13:00	09/27/16 10:43	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	14000	mg/L	5.0	1		09/25/16 20:29			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.5	Std. Units	0.10	1		09/27/16 12:40		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7780	mg/L	500	500		10/14/16 09:53	16887-00-6		
Fluoride	1.4	mg/L	0.20	1		10/14/16 00:05	16984-48-8		
Sulfate	359	mg/L	50.0	50		10/14/16 09:39	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-34-091916	Lab ID: 60228264004	Collected: 09/19/16 14:07	Received: 09/21/16 16:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.17	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:12	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	09/28/16 17:12	7440-41-7	
Boron, Total Recoverable	1.9	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:12	7440-42-8	
Calcium, Total Recoverable	231	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:12	7440-70-2	
Chromium, Total Recoverable	0.0069	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:12	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:12	7439-92-1	
Lithium	0.22	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:12	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0020	mg/L	0.0020	2	09/23/16 12:00	10/10/16 14:22	7440-36-0	D3
Arsenic, Total Recoverable	0.0030	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:30	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	09/23/16 12:00	10/10/16 13:30	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:30	7440-48-4	
Molybdenum, Total Recoverable	0.0071	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:30	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:30	7782-49-2	
Thallium, Total Recoverable	<0.0020	mg/L	0.0020	2	09/23/16 12:00	10/10/16 14:22	7440-28-0	D3
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	09/26/16 13:00	09/27/16 10:45	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	12300	mg/L	5.0	1		09/25/16 20:30		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.7	Std. Units	0.10	1		09/27/16 12:40		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	6520	mg/L	500	500		10/14/16 10:21	16887-00-6	
Fluoride	1.9	mg/L	0.20	1		10/14/16 00:19	16984-48-8	
Sulfate	511	mg/L	50.0	50		10/14/16 10:07	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: DUP-091916		Lab ID: 60228264005		Collected: 09/19/16 08:00		Received: 09/21/16 16:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.30	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:19	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	09/28/16 17:19	7440-41-7		
Boron, Total Recoverable	0.18	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:19	7440-42-8		
Calcium, Total Recoverable	58.5	mg/L	0.10	1	09/23/16 12:00	09/28/16 17:19	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:19	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	09/23/16 12:00	09/28/16 17:19	7439-92-1		
Lithium	0.013	mg/L	0.010	1	09/23/16 12:00	09/28/16 17:19	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	09/23/16 12:00	10/10/16 13:34	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7440-48-4		
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	09/23/16 12:00	10/10/16 13:34	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	09/26/16 13:00	09/27/16 10:47	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	486	mg/L	5.0	1		09/25/16 20:30			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.5	Std. Units	0.10	1		09/27/16 12:40		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	95.5	mg/L	10.0	10		10/14/16 09:36	16887-00-6		
Fluoride	0.24	mg/L	0.20	1		10/14/16 00:34	16984-48-8		
Sulfate	8.7	mg/L	1.0	1		10/14/16 00:34	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 447973 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1832815 Matrix: Water
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	09/27/16 09:53	

LABORATORY CONTROL SAMPLE: 1832816

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0058	115	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1832817 1832818

Parameter	Units	60228295001		1832817		1832818		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Mercury	mg/L	<0.20 ug/L	.005	.005	0.0031	0.0032	62	63	70-130	2	20 M1

MATRIX SPIKE SAMPLE: 1832819

Parameter	Units	60228342001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0060	119	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60228264

QC Batch: 447700 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1831369 Matrix: Water
Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	09/28/16 16:44	
Beryllium	mg/L	<0.0010	0.0010	09/28/16 16:44	
Boron	mg/L	<0.10	0.10	09/28/16 16:44	
Calcium	mg/L	<0.10	0.10	09/28/16 16:44	
Chromium	mg/L	<0.0050	0.0050	09/28/16 16:44	
Lead	mg/L	<0.0050	0.0050	09/28/16 16:44	
Lithium	mg/L	<0.010	0.010	09/28/16 16:44	

LABORATORY CONTROL SAMPLE: 1831370

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	101	85-115	
Beryllium	mg/L	1	1.0	102	85-115	
Boron	mg/L	1	1.0	100	85-115	
Calcium	mg/L	10	10.2	102	85-115	
Chromium	mg/L	1	1.0	103	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	1.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1831371 1831372

Parameter	Units	60228263003		1831371		1831372		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.058	1	1	1.1	1.1	102	100	70-130	1	20		
Beryllium	mg/L	<0.0010	1	1	1.0	1.0	104	102	70-130	2	20		
Boron	mg/L	1.3	1	1	2.4	2.4	108	105	70-130	1	20		
Calcium	mg/L	217	10	10	229	228	119	116	70-130	0	20		
Chromium	mg/L	<0.0050	1	1	1.0	1.0	104	102	70-130	2	20		
Lead	mg/L	<0.0050	1	1	0.98	0.97	98	97	70-130	1	20		
Lithium	mg/L	0.020	1	1	1.1	1.0	104	102	70-130	2	20		

MATRIX SPIKE SAMPLE: 1831373

Parameter	Units	60228265003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.034	1	1.0	100	70-130	
Beryllium	mg/L	<0.0010	1	1.0	101	70-130	
Boron	mg/L	1.1	1	2.2	111	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

MATRIX SPIKE SAMPLE:		1831373					
Parameter	Units	60228265003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	276	10	307	306	70-130	M1
Chromium	mg/L	<0.0050	1	1.0	102	70-130	
Lead	mg/L	<0.0050	1	0.97	97	70-130	
Lithium	mg/L	0.017	1	1.0	103	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 447701 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1831374 Matrix: Water
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	10/10/16 12:29	
Arsenic	mg/L	<0.0010	0.0010	10/10/16 12:29	
Cadmium	mg/L	<0.00050	0.00050	10/10/16 12:29	
Cobalt	mg/L	<0.0010	0.0010	10/10/16 12:29	
Molybdenum	mg/L	<0.0010	0.0010	10/10/16 12:29	
Selenium	mg/L	<0.0010	0.0010	10/10/16 12:29	
Thallium	mg/L	<0.0010	0.0010	10/10/16 12:29	

LABORATORY CONTROL SAMPLE: 1831375

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.040	101	85-115	
Cadmium	mg/L	.04	0.040	101	85-115	
Cobalt	mg/L	.04	0.040	101	85-115	
Molybdenum	mg/L	.04	0.042	105	85-115	
Selenium	mg/L	.04	0.040	101	85-115	
Thallium	mg/L	.04	0.039	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1831376 1831377

Parameter	Units	60228264001		1831376		1831377		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/L	<0.0010	.04	.04	0.040	0.041	99	102	70-130	2	20		
Arsenic	mg/L	<0.0010	.04	.04	0.040	0.040	99	101	70-130	2	20		
Cadmium	mg/L	<0.00050	.04	.04	0.039	0.039	98	98	70-130	1	20		
Cobalt	mg/L	<0.0010	.04	.04	0.038	0.038	94	94	70-130	0	20		
Molybdenum	mg/L	<0.0010	.04	.04	0.044	0.044	109	110	70-130	2	20		
Selenium	mg/L	<0.0010	.04	.04	0.038	0.039	96	96	70-130	0	20		
Thallium	mg/L	<0.0010	.04	.04	0.041	0.041	101	102	70-130	0	20		

MATRIX SPIKE SAMPLE: 1831378

Parameter	Units	60228265004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<0.0010	.04	0.040	99	70-130	
Arsenic	mg/L	<0.0010	.04	0.040	100	70-130	
Cadmium	mg/L	<0.00050	.04	0.040	99	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

MATRIX SPIKE SAMPLE:		1831378					
Parameter	Units	60228265004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	0.0054	.04	0.042	92	70-130	
Molybdenum	mg/L	<0.0010	.04	0.045	112	70-130	
Selenium	mg/L	<0.0010	.04	0.040	100	70-130	
Thallium	mg/L	<0.0010	.04	0.041	104	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 447881

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1832511

Matrix: Water

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	09/25/16 20:25	

LABORATORY CONTROL SAMPLE: 1832512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1050	105	80-120	

SAMPLE DUPLICATE: 1832513

Parameter	Units	60228264001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	497	496	0	10	

SAMPLE DUPLICATE: 1832514

Parameter	Units	60228265004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	913	912	0	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 448150 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

SAMPLE DUPLICATE: 1833401

Parameter	Units	60228264005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.6	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 450241 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1842319 Matrix: Water
 Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/13/16 18:26	
Fluoride	mg/L	<0.20	0.20	10/13/16 18:26	
Sulfate	mg/L	<1.0	1.0	10/13/16 18:26	

LABORATORY CONTROL SAMPLE: 1842320

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.7	107	90-110	
Sulfate	mg/L	5	5.3	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1842321 1842322

Parameter	Units	60228263001		1842321		1842322		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	232	100	100	350	348	118	117	80-120	0	15
Fluoride	mg/L	0.44	2.5	2.5	3.0	3.1	105	108	80-120	3	15
Sulfate	mg/L	208	100	100	319	318	112	110	80-120	0	15

MATRIX SPIKE SAMPLE: 1842323

Parameter	Units	60228264001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	94.6	50	147	106	80-120	
Fluoride	mg/L	0.23	2.5	2.9	105	80-120	
Sulfate	mg/L	8.6	5	13.9	106	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 450555

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60228264003, 60228264004

METHOD BLANK: 1843629

Matrix: Water

Associated Lab Samples: 60228264003, 60228264004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/14/16 08:42	
Sulfate	mg/L	<1.0	1.0	10/14/16 08:42	

LABORATORY CONTROL SAMPLE: 1843630

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	91	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1843631 1843632

Parameter	Units	60228265001		1843631		1843632		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	271	100	100	398	392	127	121	80-120	1	15 M1
Sulfate	mg/L	141	100	100	254	252	113	111	80-120	1	15

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch:	450558	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60228264005		

METHOD BLANK: 1843633 Matrix: Water
Associated Lab Samples: 60228264005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	10/14/16 08:42	

LABORATORY CONTROL SAMPLE: 1843634

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1843635 1843636

Parameter	Units	60228264005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	95.5	50	50	153	154	116	116	80-120	0	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-32-091916 **Lab ID: 60228264001** Collected: 09/19/16 10:16 Received: 09/21/16 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.00 ± 1.13 (1.43) C:NA T:87%	pCi/L	10/07/16 11:37	13982-63-3	
Radium-228	EPA 904.0	2.44 ± 0.655 (0.722) C:68% T:87%	pCi/L	10/06/16 20:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-31R-091916 **Lab ID: 60228264002** Collected: 09/19/16 11:37 Received: 09/21/16 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	4.17 ± 1.50 (1.33) C:NA T:82%	pCi/L	10/07/16 11:35	13982-63-3	
Radium-228	EPA 904.0	12.4 ± 2.39 (0.706) C:66% T:86%	pCi/L	10/06/16 20:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-33-091916 **Lab ID: 60228264003** Collected: 09/19/16 12:40 Received: 09/21/16 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	10.6 ± 2.35 (1.18) C:NA T:94%	pCi/L	10/07/16 11:37	13982-63-3	
Radium-228	EPA 904.0	11.4 ± 2.22 (0.670) C:65% T:84%	pCi/L	10/06/16 20:04	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: MW-34-091916 **Lab ID: 60228264004** Collected: 09/19/16 14:07 Received: 09/21/16 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	8.61 ± 1.99 (0.800) C:NA T:93%	pCi/L	10/07/16 11:41	13982-63-3	
Radium-228	EPA 904.0	11.1 ± 2.14 (0.604) C:73% T:82%	pCi/L	10/06/16 20:04	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Sample: DUP-091916 **Lab ID: 60228264005** Collected: 09/19/16 08:00 Received: 09/21/16 16:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.67 ± 1.04 (0.799) C:NA T:91%	pCi/L	10/07/16 11:35	13982-63-3	
Radium-228	EPA 904.0	2.70 ± 0.680 (0.640) C:68% T:87%	pCi/L	10/06/16 20:04	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 234946

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1152992

Matrix: Water

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.876 ± 0.397 (0.651) C:72% T:83%	pCi/L	10/06/16 20:17	

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: LEC CCR Groundwater

Pace Project No.: 60228264

QC Batch: 234935 Analysis Method: EPA 903.1

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

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

METHOD BLANK: 1152976 Matrix: Water

Associated Lab Samples: 60228264001, 60228264002, 60228264003, 60228264004, 60228264005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.423 (0.683) C:NA T:89%	pCi/L	10/07/16 11:21	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60228264

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60228264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60228264001	MW-32-091916	EPA 200.7	447700	EPA 200.7	447802
60228264002	MW-31R-091916	EPA 200.7	447700	EPA 200.7	447802
60228264003	MW-33-091916	EPA 200.7	447700	EPA 200.7	447802
60228264004	MW-34-091916	EPA 200.7	447700	EPA 200.7	447802
60228264005	DUP-091916	EPA 200.7	447700	EPA 200.7	447802
60228264001	MW-32-091916	EPA 200.8	447701	EPA 200.8	447804
60228264002	MW-31R-091916	EPA 200.8	447701	EPA 200.8	447804
60228264003	MW-33-091916	EPA 200.8	447701	EPA 200.8	447804
60228264004	MW-34-091916	EPA 200.8	447701	EPA 200.8	447804
60228264005	DUP-091916	EPA 200.8	447701	EPA 200.8	447804
60228264001	MW-32-091916	EPA 245.1	447973	EPA 245.1	448023
60228264002	MW-31R-091916	EPA 245.1	447973	EPA 245.1	448023
60228264003	MW-33-091916	EPA 245.1	447973	EPA 245.1	448023
60228264004	MW-34-091916	EPA 245.1	447973	EPA 245.1	448023
60228264005	DUP-091916	EPA 245.1	447973	EPA 245.1	448023
60228264001	MW-32-091916	EPA 903.1	234935		
60228264002	MW-31R-091916	EPA 903.1	234935		
60228264003	MW-33-091916	EPA 903.1	234935		
60228264004	MW-34-091916	EPA 903.1	234935		
60228264005	DUP-091916	EPA 903.1	234935		
60228264001	MW-32-091916	EPA 904.0	234946		
60228264002	MW-31R-091916	EPA 904.0	234946		
60228264003	MW-33-091916	EPA 904.0	234946		
60228264004	MW-34-091916	EPA 904.0	234946		
60228264005	DUP-091916	EPA 904.0	234946		
60228264001	MW-32-091916	SM 2540C	447881		
60228264002	MW-31R-091916	SM 2540C	447881		
60228264003	MW-33-091916	SM 2540C	447881		
60228264004	MW-34-091916	SM 2540C	447881		
60228264005	DUP-091916	SM 2540C	447881		
60228264001	MW-32-091916	SM 4500-H+B	448150		
60228264002	MW-31R-091916	SM 4500-H+B	448150		
60228264003	MW-33-091916	SM 4500-H+B	448150		
60228264004	MW-34-091916	SM 4500-H+B	448150		
60228264005	DUP-091916	SM 4500-H+B	448150		
60228264001	MW-32-091916	EPA 300.0	450241		
60228264002	MW-31R-091916	EPA 300.0	450241		
60228264003	MW-33-091916	EPA 300.0	450241		
60228264003	MW-33-091916	EPA 300.0	450555		
60228264004	MW-34-091916	EPA 300.0	450241		
60228264004	MW-34-091916	EPA 300.0	450555		
60228264005	DUP-091916	EPA 300.0	450241		
60228264005	DUP-091916	EPA 300.0	450558		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater
Pace Project No.: 60228264

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
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REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60228264



HMW

Client Name: Westar Env

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

Tracking #: _____ 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 2:PL

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

Cooler Temperature (°C): As-read 2.1 Corr. Factor CF +1.1 CF -0.1 Corrected 2.0

Date and initials of person examining contents: 8/9/21/HM

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: HMW

Date: 9/22/16



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: Company: WESTAR ENERGY Address: 818 Kansas Ave Topeka, KS 66612 Email To: brandon.l.griffin@westarenergy.com Phone: (785) 575-8135 Requested Due Date/TAT: 7 DAY	Section B Required Project Information: Report To: Brandon Griffin Copy To: Jared Morrison, Heath Horyna Purchase Order No.: Project Name: LEC CCR Groundwater Project Number:	Section C Invoice Information: Attention: Jared Morrison Company Name: WESTAR ENERGY Address: SEE SECTION A Pace Quote Reference: Pace Project Manager: Heather Wilson, 913-563-1407 Pace Profile #: 9655, 1	REGULATORY AGENCY <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER Site Location: STATE: KS
---	---	--	---

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				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Requested Analysis Filtered (Y/N)							Residual Chlorine (Y/N)			
					COMPOSITE START	COMPOSITE END/GRAB						Analysis Test ↓	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Mercury	300.0 Cl, F, I, SO ₄	4500 H+B	2540C TDS		Radium 226	Radium 228	
1	MW-32-091916		WT G	G			9/19/16	1016		4	1	3									60228264	
2	MW-31A-091916		WT G	G			9/19/16	1137		4	1	3										
3	MW-33-091916		WT G	G			9/19/16	1240		4	1	3										
4	MW-34-091916		WT G	G			9/19/16	1407		4	1	3										
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12	DUP-091916		WT G	G			9/19/16	0800		4	1	3										

Pace Project No. / Lab I.D.

2 (BIN) B2AN, B2AL
 2.3 2.0
 ↓ ↓ ↓
 w2
 w3
 w4

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*200.7 Total Metals: Ba, Be, B, Ca, Cr, Pb, Li	B. Griffin / Westar	9/20/16	1500	Shadell MCLEOD / PAS E	9/21/16	1640	2.0	4	7	4
**200.8 Total Metals: Co, As, Se, Mo, Cd, Sb, 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: Brandon Griffin
					SIGNATURE of SAMPLER: B. Griffin DATE Signed (MM/DD/YY): 09/19/16

*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.

Page 32 of 34



30196934



Workorder: 60228264

Workorder Name: LEC CCR Groudwater

Owner Received Date: 9/21/2016 Results Requested By: 10/14/2016

Report To		Subcontract To					Requested Analysis												LAB USE ONLY																												
Heather Wilson 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					Radium 226 & 228																																								
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	BPIN	Preserved Containers					Radium 226 & 228												LAB USE ONLY																							
1	MW-32-091916	PS	9/19/2016 10:16	60228264001	Water	2																														001											
2	MW-31R-091916	PS	9/19/2016 11:37	60228264002	Water	2																													002												
3	MW-33-091916	PS	9/19/2016 12:40	60228264003	Water	2																												003													
4	MW-34-091916	PS	9/19/2016 14:07	60228264004	Water	2																												004													
5	DUP-091916	PS	9/19/2016 08:00	60228264005	Water	2																												005													
Transfers		Released By		Date/Time		Received		Date/Time		Comments																																					
1		<i>[Signature]</i>		9/22/16 17:00		<i>[Signature]</i>		9-23-16 1030																																							
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



Client Name: Pace KS

Project # 30196934

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 704466538647

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: MTV
9-23-16

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:	X			5.
-Includes date/time/ID/Analysis Matrix: <u>WT</u>				
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:	X			10.
-Pace Containers Used:	X			
Containers Intact:	X			11.
Filtered volume received for Dissolved tests			X	12.
All containers needing preservation have been checked.	X			13.
All containers needing preservation are found to be in compliance with EPA recommendation.	X			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed: <u>MTV</u> 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: <u>MTV</u> Date: <u>9-23-16</u>

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.

ATTACHMENT 1-3
October 2016 Sampling Event
Laboratory Analytical Report

September 13, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60231192

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on October 31, 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.

Revised Report_rev.1 Per the client's request, samples 60231192-002, -003, & -004 were re-evaluated down to the MDL.

Revised Report_rev.2 Per the client's request, sample 60231192005 was re-evaluated down to the MDL.

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

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.

JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

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

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: LEC CCR Groundwater

Pace Project No.: 60231192

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60231192001	MW-32-103116	Water	10/31/16 08:50	10/31/16 15:25
60231192002	MW-31R-103116	Water	10/31/16 09:55	10/31/16 15:25
60231192003	MW-33-103116	Water	10/31/16 11:31	10/31/16 15:25
60231192004	MW-34-103116	Water	10/31/16 12:43	10/31/16 15:25
60231192005	DUP-103116	Water	10/31/16 07:00	10/31/16 15:25

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231192001	MW-32-103116	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60231192002	MW-31R-103116	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60231192003	MW-33-103116	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60231192004	MW-34-103116	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60231192005	DUP-103116	EPA 200.7	SMW	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-32-103116	Lab ID: 60231192001	Collected: 10/31/16 08:50	Received: 10/31/16 15:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.30	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:34	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/04/16 19:34	7440-41-7	
Boron, Total Recoverable	0.17	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:34	7440-42-8	
Calcium, Total Recoverable	58.5	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:34	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:34	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:34	7439-92-1	
Lithium	0.015	mg/L	0.010	1	11/02/16 17:15	11/04/16 19:34	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	11/02/16 17:15	11/16/16 17:02	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7440-48-4	
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:02	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	11/10/16 16:20	11/14/16 11:33	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	466	mg/L	5.0	1		11/01/16 16:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.9	Std. Units	0.10	1		11/09/16 14:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	93.0	mg/L	10.0	10		11/18/16 18:55	16887-00-6	
Fluoride	0.22	mg/L	0.20	1		11/16/16 20:08	16984-48-8	
Sulfate	8.1	mg/L	1.0	1		11/16/16 20:08	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-31R-103116		Lab ID: 60231192002	Collected: 10/31/16 09:55	Received: 10/31/16 15:25	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.21	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:37	7440-39-3	
Beryllium, Total Recoverable	<0.00026	mg/L	0.0010	1	11/02/16 17:15	11/04/16 19:37	7440-41-7	
Boron, Total Recoverable	0.69	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:37	7440-42-8	
Calcium, Total Recoverable	228	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:37	7440-70-2	
Chromium, Total Recoverable	0.0022J	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:37	7440-47-3	
Lead, Total Recoverable	<0.0025	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:37	7439-92-1	
Lithium	0.14	mg/L	0.010	1	11/02/16 17:15	11/04/16 19:37	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00039J	mg/L	0.0020	2	11/02/16 17:15	11/17/16 15:29	7440-36-0	D3
Arsenic, Total Recoverable	0.00094J	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:07	7440-38-2	
Cadmium, Total Recoverable	<0.000058	mg/L	0.0010	2	11/02/16 17:15	11/17/16 15:29	7440-43-9	D3
Cobalt, Total Recoverable	<0.0010	mg/L	0.0020	2	11/02/16 17:15	11/17/16 15:29	7440-48-4	D3
Molybdenum, Total Recoverable	0.0078	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:07	7439-98-7	
Selenium, Total Recoverable	<0.00018	mg/L	0.0010	1	11/02/16 17:15	11/16/16 17:07	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0020	2	11/02/16 17:15	11/17/16 15:29	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000039	mg/L	0.00020	1	11/10/16 16:20	11/14/16 11:35	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	6100	mg/L	5.0	1		11/01/16 16:35		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		11/09/16 14:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	5210	mg/L	500	500		11/18/16 19:24	16887-00-6	
Fluoride	0.73	mg/L	0.20	1		11/16/16 20:21	16984-48-8	
Sulfate	175	mg/L	10.0	10		11/18/16 19:09	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-33-103116	Lab ID: 60231192003	Collected: 10/31/16 11:31	Received: 10/31/16 15:25	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.16	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:41	7440-39-3	
Beryllium, Total Recoverable	<0.00026	mg/L	0.0010	1	11/02/16 17:15	11/04/16 19:41	7440-41-7	
Boron, Total Recoverable	1.5	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:41	7440-42-8	
Calcium, Total Recoverable	251	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:41	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:41	7440-47-3	
Lead, Total Recoverable	<0.0025	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:41	7439-92-1	
Lithium	0.22	mg/L	0.010	1	11/02/16 17:15	11/04/16 19:41	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	0.00030J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7440-36-0	D3
Arsenic, Total Recoverable	0.0017J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7440-38-2	D3
Cadmium, Total Recoverable	<0.00087	mg/L	0.0015	3	11/02/16 17:15	11/17/16 15:33	7440-43-9	D3
Cobalt, Total Recoverable	0.0017J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7440-48-4	D3
Molybdenum, Total Recoverable	0.0081	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7439-98-7	
Selenium, Total Recoverable	<0.00055	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7782-49-2	D3
Thallium, Total Recoverable	<0.0015	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:33	7440-28-0	D3
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.000039	mg/L	0.00020	1	11/10/16 16:20	11/14/16 11:37	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	9800	mg/L	5.0	1		11/01/16 16:36		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.5	Std. Units	0.10	1		11/09/16 14:50		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	7850	mg/L	500	500		11/18/16 19:52	16887-00-6	
Fluoride	1.2	mg/L	0.20	1		11/16/16 21:03	16984-48-8	
Sulfate	345	mg/L	20.0	20		11/18/16 19:38	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-34-103116		Lab ID: 60231192004		Collected: 10/31/16 12:43	Received: 10/31/16 15:25	Matrix: Water		
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.16	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:45	7440-39-3	
Beryllium, Total Recoverable	<0.00026	mg/L	0.0010	1	11/02/16 17:15	11/04/16 19:45	7440-41-7	
Boron, Total Recoverable	1.9	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:45	7440-42-8	
Calcium, Total Recoverable	224	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:45	7440-70-2	
Chromium, Total Recoverable	0.0054	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:45	7440-47-3	
Lead, Total Recoverable	<0.0025	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:45	7439-92-1	
Lithium	0.23	mg/L	0.010	1	11/02/16 17:15	11/04/16 19:45	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.00018	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7440-36-0	D3
Arsenic, Total Recoverable	0.0030J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7440-38-2	D3
Cadmium, Total Recoverable	<0.000087	mg/L	0.0015	3	11/02/16 17:15	11/17/16 15:36	7440-43-9	D3
Cobalt, Total Recoverable	<0.0015	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7440-48-4	D3
Molybdenum, Total Recoverable	0.0069	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7439-98-7	
Selenium, Total Recoverable	<0.00055	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7782-49-2	D3
Thallium, Total Recoverable	<0.0015	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:36	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000039	mg/L	0.00020	1	11/10/16 16:20	11/14/16 11:39	7439-97-6	M1
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	3100	mg/L	5.0	1		11/01/16 16:37		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.7	Std. Units	0.10	1		11/09/16 14:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	6790	mg/L	500	500		11/18/16 20:49	16887-00-6	
Fluoride	1.6	mg/L	0.20	1		11/16/16 21:17	16984-48-8	
Sulfate	517	mg/L	50.0	50		11/18/16 20:34	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: DUP-103116	Lab ID: 60231192005	Collected: 10/31/16 07:00	Received: 10/31/16 15:25	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.22	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:49	7440-39-3	
Beryllium, Total Recoverable	<0.00026	mg/L	0.0010	1	11/02/16 17:15	11/04/16 19:49	7440-41-7	
Boron, Total Recoverable	0.70	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:49	7440-42-8	
Calcium, Total Recoverable	230	mg/L	0.10	1	11/02/16 17:15	11/04/16 19:49	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:49	7440-47-3	
Lead, Total Recoverable	<0.0025	mg/L	0.0050	1	11/02/16 17:15	11/04/16 19:49	7439-92-1	
Lithium	0.14	mg/L	0.010	1	11/02/16 17:15	11/04/16 19:49	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	0.00038J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7440-36-0	D3
Arsenic, Total Recoverable	0.00073J	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7440-38-2	D3
Cadmium, Total Recoverable	<0.000087	mg/L	0.0015	3	11/02/16 17:15	11/17/16 15:39	7440-43-9	D3
Cobalt, Total Recoverable	<0.0015	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7440-48-4	D3
Molybdenum, Total Recoverable	0.0078	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7439-98-7	
Selenium, Total Recoverable	<0.00055	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7782-49-2	D3
Thallium, Total Recoverable	<0.0015	mg/L	0.0030	3	11/02/16 17:15	11/17/16 15:39	7440-28-0	D3
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.000039	mg/L	0.00020	1	11/10/16 16:20	11/14/16 11:44	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	6600	mg/L	5.0	1		11/01/16 16:37		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.3	Std. Units	0.10	1		11/07/16 11:20		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	5030	mg/L	500	500		11/18/16 21:17	16887-00-6	
Fluoride	0.78	mg/L	0.20	1		11/16/16 21:31	16984-48-8	
Sulfate	176	mg/L	20.0	20		11/18/16 21:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 454294 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1860292 Matrix: Water
 Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	11/14/16 10:57	

LABORATORY CONTROL SAMPLE: 1860293

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1860294 1860295

Parameter	Units	60231414001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	mg/L	ND	.005	.005	.0054	0.0049	107	98	70-130	9	20				

MATRIX SPIKE SAMPLE: 1860296

Parameter	Units	60231192004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.000039	.005	0.0021	41	70-130	M1

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60231192

QC Batch: 453164 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1854941 Matrix: Water
Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	11/04/16 18:09	
Beryllium	mg/L	<0.0010	0.0010	11/04/16 18:09	
Boron	mg/L	<0.10	0.10	11/04/16 18:09	
Calcium	mg/L	<0.10	0.10	11/04/16 18:09	
Chromium	mg/L	<0.0050	0.0050	11/04/16 18:09	
Lead	mg/L	<0.0050	0.0050	11/04/16 18:09	
Lithium	mg/L	<0.010	0.010	11/04/16 18:09	

LABORATORY CONTROL SAMPLE: 1854942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	104	85-115	
Beryllium	mg/L	1	1.0	103	85-115	
Boron	mg/L	1	0.99	99	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	1.0	103	85-115	
Lead	mg/L	1	1.1	106	85-115	
Lithium	mg/L	1	1.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854943 1854944

Parameter	Units	60231100001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	59.2 ug/L	1	1	1.1	1.1	105	106	70-130	1	20		
Beryllium	mg/L	ND	1	1	1.0	1.0	102	103	70-130	1	20		
Boron	mg/L	2920 ug/L	1	1	3.9	3.9	100	102	70-130	1	20		
Calcium	mg/L	19900 ug/L	10	10	30.2	30.3	104	104	70-130	0	20		
Chromium	mg/L	ND	1	1	1.0	1.0	103	104	70-130	2	20		
Lead	mg/L	ND	1	1	0.97	0.98	97	98	70-130	1	20		
Lithium	mg/L	52.5 ug/L	1	1	1.1	1.1	105	106	70-130	1	20		

MATRIX SPIKE SAMPLE: 1854945

Parameter	Units	60231108002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	ND	1	1.0	101	70-130	
Beryllium	mg/L	ND	1	0.97	97	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

MATRIX SPIKE SAMPLE: 1854945		60231108002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Boron	mg/L	ND	1	1.0	99	70-130	
Calcium	mg/L	2.0	10	11.8	99	70-130	
Chromium	mg/L	ND	1	1.0	100	70-130	
Lead	mg/L	ND	1	0.94	94	70-130	
Lithium	mg/L	ND	1	1.1	106	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60231192

QC Batch: 453165 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1854946 Matrix: Water
Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	11/11/16 14:45	
Arsenic	mg/L	<0.0010	0.0010	11/11/16 14:45	
Cadmium	mg/L	<0.00050	0.00050	11/11/16 14:45	
Cobalt	mg/L	<0.0010	0.0010	11/11/16 14:45	
Molybdenum	mg/L	<0.0010	0.0010	11/11/16 14:45	
Selenium	mg/L	<0.0010	0.0010	11/11/16 14:45	
Thallium	mg/L	<0.0010	0.0010	11/11/16 14:45	

LABORATORY CONTROL SAMPLE: 1854947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.039	99	85-115	
Arsenic	mg/L	.04	0.039	98	85-115	
Cadmium	mg/L	.04	0.039	99	85-115	
Cobalt	mg/L	.04	0.041	103	85-115	
Molybdenum	mg/L	.04	0.043	106	85-115	
Selenium	mg/L	.04	0.038	95	85-115	
Thallium	mg/L	.04	0.039	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854948 1854949

Parameter	Units	60231249001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	ND	.04	.04	0.038	0.039	96	97	70-130	1	20		
Arsenic	mg/L	ND	.04	.04	0.039	0.040	98	99	70-130	1	20		
Cadmium	mg/L	ND	.04	.04	0.038	0.038	95	94	70-130	1	20		
Cobalt	mg/L	ND	.04	.04	0.039	0.040	98	99	70-130	1	20		
Molybdenum	mg/L	1.7 ug/L	.04	.04	0.045	0.045	108	108	70-130	0	20		
Selenium	mg/L	ND	.04	.04	0.036	0.036	91	91	70-130	0	20		
Thallium	mg/L	ND	.04	.04	0.041	0.041	102	103	70-130	0	20		

MATRIX SPIKE SAMPLE: 1854950

Parameter	Units	60231233002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	ND	.04	0.039	97	70-130	
Arsenic	mg/L	4.6 ug/L	.04	0.043	95	70-130	
Cadmium	mg/L	0.89 ug/L	.04	0.038	94	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

MATRIX SPIKE SAMPLE:		1854950					
Parameter	Units	60231233002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	ND	.04	0.039	96	70-130	
Molybdenum	mg/L	ND	.04	0.044	109	70-130	
Selenium	mg/L	ND	.04	0.035	86	70-130	
Thallium	mg/L	ND	.04	0.043	104	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 452983

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1854339

Matrix: Water

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	11/01/16 16:20	

LABORATORY CONTROL SAMPLE: 1854340

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

SAMPLE DUPLICATE: 1854341

Parameter	Units	60231099009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	584	608	4	10	

SAMPLE DUPLICATE: 1854342

Parameter	Units	60231104008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	419	433	3	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 453715 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60231192005

SAMPLE DUPLICATE: 1857877

Parameter	Units	60230599002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.4	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 454181 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004

SAMPLE DUPLICATE: 1859730

Parameter	Units	60231192001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 455243 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1864072 Matrix: Water

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	11/16/16 17:21	
Sulfate	mg/L	<1.0	1.0	11/16/16 17:21	

LABORATORY CONTROL SAMPLE: 1864073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 455673

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1865805

Matrix: Water

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	11/18/16 14:54	
Sulfate	mg/L	<1.0	1.0	11/18/16 14:54	

LABORATORY CONTROL SAMPLE: 1865806

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1865807 1865808

Parameter	Units	60231780001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.								
Sulfate	mg/L	262	250	250	521	512	104	100	80-120	2	15	

MATRIX SPIKE SAMPLE: 1865809

Parameter	Units	60231826001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	199	250	481	113	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-32-103116 **Lab ID: 60231192001** Collected: 10/31/16 08:50 Received: 10/31/16 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.87 ± 1.17 (0.559) C:NA T:74%	pCi/L	11/22/16 14:32	13982-63-3	
Radium-228	EPA 904.0	3.22 ± 0.833 (0.837) C:67% T:85%	pCi/L	11/21/16 15:38	15262-20-1	
Total Radium	Total Radium Calculation	7.09 ± 2.00 (1.40)	pCi/L	11/29/16 16:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-31R-103116 **Lab ID: 60231192002** Collected: 10/31/16 09:55 Received: 10/31/16 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	6.12 ± 1.56 (0.729) C:NA T:74%	pCi/L	11/22/16 14:51	13982-63-3	
Radium-228	EPA 904.0	20.6 ± 3.90 (0.767) C:68% T:82%	pCi/L	11/21/16 15:38	15262-20-1	
Total Radium	Total Radium Calculation	26.7 ± 5.46 (1.50)	pCi/L	11/29/16 16:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-33-103116 **Lab ID: 60231192003** Collected: 10/31/16 11:31 Received: 10/31/16 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	15.7 ± 2.90 (1.30) C:NA T:74%	pCi/L	11/22/16 15:00	13982-63-3	
Radium-228	EPA 904.0	9.11 ± 1.88 (0.936) C:67% T:86%	pCi/L	11/21/16 12:48	15262-20-1	
Total Radium	Total Radium Calculation	24.8 ± 4.78 (2.24)	pCi/L	11/29/16 16:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: MW-34-103116 **Lab ID: 60231192004** Collected: 10/31/16 12:43 Received: 10/31/16 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.582 ± 0.574 (0.874) C:NA T:84%	pCi/L	11/22/16 14:58	13982-63-3	
Radium-228	EPA 904.0	10.0 ± 2.07 (0.967) C:62% T:82%	pCi/L	11/21/16 12:48	15262-20-1	
Total Radium	Total Radium Calculation	10.6 ± 2.64 (1.84)	pCi/L	11/29/16 16:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Sample: DUP-103116 **Lab ID: 60231192005** Collected: 10/31/16 07:00 Received: 10/31/16 15:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	16.0 ± 2.86 (0.806) C:NA T:74%	pCi/L	11/22/16 14:50	13982-63-3	
Radium-228	EPA 904.0	17.1 ± 3.27 (0.780) C:73% T:80%	pCi/L	11/21/16 11:48	15262-20-1	
Total Radium	Total Radium Calculation	33.1 ± 6.13 (1.59)	pCi/L	11/29/16 16:55	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch:	240370	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60231192001, 60231192002, 60231192003, 60231192004, 60231192005		

METHOD BLANK:	1181272	Matrix:	Water
Associated Lab Samples:	60231192001, 60231192002, 60231192003, 60231192004, 60231192005		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.084 ± 0.487 (0.972) C:NA T:82%	pCi/L	11/22/16 14:28	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60231192

QC Batch: 240371 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

METHOD BLANK: 1181275 Matrix: Water

Associated Lab Samples: 60231192001, 60231192002, 60231192003, 60231192004, 60231192005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.527 ± 0.432 (0.847) C:56% T:80%	pCi/L	11/21/16 11:44	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60231192

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231192001	MW-32-103116	EPA 200.7	453164	EPA 200.7	453252
60231192002	MW-31R-103116	EPA 200.7	453164	EPA 200.7	453252
60231192003	MW-33-103116	EPA 200.7	453164	EPA 200.7	453252
60231192004	MW-34-103116	EPA 200.7	453164	EPA 200.7	453252
60231192005	DUP-103116	EPA 200.7	453164	EPA 200.7	453252
60231192001	MW-32-103116	EPA 200.8	453165	EPA 200.8	453226
60231192002	MW-31R-103116	EPA 200.8	453165	EPA 200.8	453226
60231192003	MW-33-103116	EPA 200.8	453165	EPA 200.8	453226
60231192004	MW-34-103116	EPA 200.8	453165	EPA 200.8	453226
60231192005	DUP-103116	EPA 200.8	453165	EPA 200.8	453226
60231192001	MW-32-103116	EPA 245.1	454294	EPA 245.1	454434
60231192002	MW-31R-103116	EPA 245.1	454294	EPA 245.1	454434
60231192003	MW-33-103116	EPA 245.1	454294	EPA 245.1	454434
60231192004	MW-34-103116	EPA 245.1	454294	EPA 245.1	454434
60231192005	DUP-103116	EPA 245.1	454294	EPA 245.1	454434
60231192001	MW-32-103116	EPA 903.1	240370		
60231192002	MW-31R-103116	EPA 903.1	240370		
60231192003	MW-33-103116	EPA 903.1	240370		
60231192004	MW-34-103116	EPA 903.1	240370		
60231192005	DUP-103116	EPA 903.1	240370		
60231192001	MW-32-103116	EPA 904.0	240371		
60231192002	MW-31R-103116	EPA 904.0	240371		
60231192003	MW-33-103116	EPA 904.0	240371		
60231192004	MW-34-103116	EPA 904.0	240371		
60231192005	DUP-103116	EPA 904.0	240371		
60231192001	MW-32-103116	Total Radium Calculation	241670		
60231192002	MW-31R-103116	Total Radium Calculation	241670		
60231192003	MW-33-103116	Total Radium Calculation	241670		
60231192004	MW-34-103116	Total Radium Calculation	241670		
60231192005	DUP-103116	Total Radium Calculation	241670		
60231192001	MW-32-103116	SM 2540C	452983		
60231192002	MW-31R-103116	SM 2540C	452983		
60231192003	MW-33-103116	SM 2540C	452983		
60231192004	MW-34-103116	SM 2540C	452983		
60231192005	DUP-103116	SM 2540C	452983		
60231192001	MW-32-103116	SM 4500-H+B	454181		
60231192002	MW-31R-103116	SM 4500-H+B	454181		
60231192003	MW-33-103116	SM 4500-H+B	454181		
60231192004	MW-34-103116	SM 4500-H+B	454181		
60231192005	DUP-103116	SM 4500-H+B	453715		
60231192001	MW-32-103116	EPA 300.0	455243		
60231192001	MW-32-103116	EPA 300.0	455673		
60231192002	MW-31R-103116	EPA 300.0	455243		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60231192

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231192002	MW-31R-103116	EPA 300.0	455673		
60231192003	MW-33-103116	EPA 300.0	455243		
60231192003	MW-33-103116	EPA 300.0	455673		
60231192004	MW-34-103116	EPA 300.0	455243		
60231192004	MW-34-103116	EPA 300.0	455673		
60231192005	DUP-103116	EPA 300.0	455243		
60231192005	DUP-103116	EPA 300.0	455673		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60231192



Client Name: Weglar

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

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

Cooler Temperature (°C): As-read 2.5 Corr. Factor CF +0.7 CF -0.5 Corrected 3.2

Date and initials of person examining contents: 11/1/16

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 11/1/16



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: WESTAR ENERGY; Section B Required Project Information: Report To: Brandon Griffin; Section C Invoice Information: Attention: Jared Morrison; REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER; Site Location: KS; STATE: KS

Table with columns: ITEM #, Section D Required Client Information (SAMPLE ID), Valid Matrix Codes, MATRIX CODE, COLLECTED (COMPOSITE START/END), PRESERVATIVES (Unpreserved, H2SO4, HNO3, HCl, NaOH, Na2S2O3, Methanol, Other), Analysis Test (200.7 Total Metals, 200.8 Total Metals, 245.1 Total Mercury, 300.0 Cl, F, SO4, 4500 H+B, 2540C TDS, Radium 226, Radium 228), Residual Chlorine (Y/N), Pace Project No./ Lab I.D. (60731192)

Table with columns: ADDITIONAL COMMENTS, RELINQUISHED BY / AFFILIATION, DATE, TIME, ACCEPTED BY / AFFILIATION, DATE, TIME, SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE: PRINT Name of SAMPLER: Brandon Griffin; SIGNATURE of SAMPLER: [Signature]; DATE Signed (MM/DD/YY): 10/31/16; 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.

Sample Condition Upon Receipt Pittsburgh



Client Name: Pace Kansas

Project # 30201273

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7044 6055 8178

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: YH 11-2-16

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

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.

ATTACHMENT 1-4
December 2016 Sampling Event
Laboratory Analytical Report

January 17, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60234133

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on December 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.

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

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60234133001	MW-32-121216	Water	12/12/16 10:56	12/12/16 17:25
60234133002	MW-31R-121216	Water	12/12/16 12:24	12/12/16 17:25
60234133003	MW-33-121216	Water	12/12/16 13:34	12/12/16 17:25
60234133004	MW-34-121216	Water	12/12/16 15:15	12/12/16 17:25
60234133005	DUP-121216	Water	12/12/16 06:00	12/12/16 17:25

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60234133001	MW-32-121216	EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60234133002	MW-31R-121216	EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60234133003	MW-33-121216	EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60234133004	MW-34-121216	EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60234133005	DUP-121216	EPA 200.7	ZBM	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	SMW	7	PASI-K
		EPA 245.1	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-32-121216		Lab ID: 60234133001		Collected: 12/12/16 10:56	Received: 12/12/16 17:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.35	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:31	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/23/16 15:15	12/28/16 12:31	7440-41-7	
Boron, Total Recoverable	0.19	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:31	7440-42-8	
Calcium, Total Recoverable	58.2	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:31	7440-70-2	
Chromium, Total Recoverable	0.0068	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:31	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:31	7439-92-1	
Lithium	0.017	mg/L	0.010	1	12/23/16 15:15	12/28/16 12:31	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:06	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:06	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/14/16 16:00	12/15/16 17:06	7440-43-9	
Cobalt, Total Recoverable	0.0015	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:06	7440-48-4	
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:06	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/30/16 13:05	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:06	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/13/16 14:15	12/14/16 12:46	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	480	mg/L	5.0	1		12/14/16 16:13		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		12/19/16 09:30		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	92.2	mg/L	10.0	10		12/31/16 12:47	16887-00-6	
Fluoride	0.22	mg/L	0.20	1		12/30/16 15:42	16984-48-8	
Sulfate	7.6	mg/L	1.0	1		12/30/16 15:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-31R-121216	Lab ID: 60234133002	Collected: 12/12/16 12:24		Received: 12/12/16 17:25		Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.24	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:33	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/23/16 15:15	12/28/16 12:33	7440-41-7	
Boron, Total Recoverable	0.69	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:33	7440-42-8	
Calcium, Total Recoverable	232	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:33	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:33	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:33	7439-92-1	
Lithium	0.13	mg/L	0.010	1	12/23/16 15:15	12/28/16 12:33	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:11	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:11	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/14/16 16:00	12/30/16 13:10	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:11	7440-48-4	
Molybdenum, Total Recoverable	0.0042	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:11	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/30/16 13:10	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:11	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/13/16 14:15	12/14/16 12:53	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	7850	mg/L	5.0	1		12/14/16 16:14		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.3	Std. Units	0.10	1		12/19/16 09:30		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	4160	mg/L	500	500		12/31/16 13:43	16887-00-6	
Fluoride	0.53	mg/L	0.20	1		12/30/16 15:56	16984-48-8	
Sulfate	150	mg/L	10.0	10		01/03/17 09:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-33-121216		Lab ID: 60234133003		Collected: 12/12/16 13:34		Received: 12/12/16 17:25		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.16	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:41	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/23/16 15:15	12/28/16 12:41	7440-41-7		
Boron, Total Recoverable	1.7	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:41	7440-42-8		
Calcium, Total Recoverable	254	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:41	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:41	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:41	7439-92-1		
Lithium	0.21	mg/L	0.010	1	12/23/16 15:15	12/28/16 12:41	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:15	7440-36-0		
Arsenic, Total Recoverable	0.0018	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:15	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/14/16 16:00	12/15/16 17:15	7440-43-9		
Cobalt, Total Recoverable	0.0016	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:15	7440-48-4		
Molybdenum, Total Recoverable	0.0059	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:15	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/30/16 13:14	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:15	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	12/13/16 14:15	12/14/16 13:00	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	12300	mg/L	5.0	1		12/14/16 16:15			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.4	Std. Units	0.10	1		12/19/16 09:30		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7210	mg/L	500	500		12/31/16 14:10	16887-00-6		
Fluoride	<0.20	mg/L	0.20	1		12/30/16 16:10	16984-48-8		
Sulfate	349	mg/L	50.0	50		01/03/17 20:50	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-34-121216		Lab ID: 60234133004		Collected: 12/12/16 15:15	Received: 12/12/16 17:25	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.18	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:48	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/23/16 15:15	12/28/16 12:48	7440-41-7	
Boron, Total Recoverable	2.0	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:48	7440-42-8	
Calcium, Total Recoverable	243	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:48	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:48	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:48	7439-92-1	
Lithium	0.23	mg/L	0.010	1	12/23/16 15:15	12/28/16 12:48	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:19	7440-36-0	
Arsenic, Total Recoverable	0.0026	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:19	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/14/16 16:00	12/15/16 17:19	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:19	7440-48-4	
Molybdenum, Total Recoverable	0.0061	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:19	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/30/16 13:19	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:19	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	12/13/16 14:15	12/14/16 13:02	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	10300	mg/L	5.0	1		12/14/16 16:16		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.5	Std. Units	0.10	1		12/19/16 09:30		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	5930	mg/L	500	500		12/31/16 14:38	16887-00-6	
Fluoride	1.3	mg/L	0.20	1		12/30/16 17:05	16984-48-8	
Sulfate	499	mg/L	50.0	50		01/03/17 10:14	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: DUP-121216		Lab ID: 60234133005		Collected: 12/12/16 06:00		Received: 12/12/16 17:25		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.34	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:50	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/23/16 15:15	12/28/16 12:50	7440-41-7		
Boron, Total Recoverable	0.19	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:50	7440-42-8		
Calcium, Total Recoverable	61.0	mg/L	0.10	1	12/23/16 15:15	12/28/16 12:50	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:50	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	12/23/16 15:15	12/28/16 12:50	7439-92-1		
Lithium	0.017	mg/L	0.010	1	12/23/16 15:15	12/28/16 12:50	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:24	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:24	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	12/14/16 16:00	12/15/16 17:24	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:24	7440-48-4		
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:24	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/30/16 13:23	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	12/14/16 16:00	12/15/16 17:24	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	12/13/16 14:15	12/14/16 13:04	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	488	mg/L	5.0	1		12/14/16 16:16			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.6	Std. Units	0.10	1		12/19/16 09:30		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	98.6	mg/L	10.0	10		12/31/16 14:52	16887-00-6		
Fluoride	0.21	mg/L	0.20	1		12/30/16 17:19	16984-48-8		
Sulfate	7.7	mg/L	1.0	1		12/30/16 17:19	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 458789 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1878164 Matrix: Water
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	12/14/16 12:42	

LABORATORY CONTROL SAMPLE: 1878165

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0053	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1878166 1878167

Parameter	Units	60234133001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Mercury	mg/L	<0.00020	.005	.005	0.0061	0.0052	121	104	70-130	16	20		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 460236 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1884140 Matrix: Water
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	12/28/16 12:26	
Beryllium	mg/L	<0.0010	0.0010	12/28/16 12:26	
Boron	mg/L	<0.10	0.10	12/28/16 12:26	
Calcium	mg/L	<0.10	0.10	12/28/16 12:26	
Chromium	mg/L	<0.0050	0.0050	12/28/16 12:26	
Lead	mg/L	<0.0050	0.0050	12/28/16 12:26	
Lithium	mg/L	<0.010	0.010	12/28/16 12:26	

LABORATORY CONTROL SAMPLE: 1884141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	103	85-115	
Beryllium	mg/L	1	1.0	104	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	10	100	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	0.98	98	85-115	
Lithium	mg/L	1	1.1	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1884142 1884143

Parameter	Units	60234133003		1884143		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.16	1	1	1.2	1.2	104	105	70-130	1	20
Beryllium	mg/L	<0.0010	1	1	1.0	1.0	102	103	70-130	2	20
Boron	mg/L	1.7	1	1	2.7	2.7	104	99	70-130	2	20
Calcium	mg/L	254	10	10	266	262	113	83	70-130	1	20
Chromium	mg/L	<0.0050	1	1	0.96	0.96	96	96	70-130	0	20
Lead	mg/L	<0.0050	1	1	0.87	0.86	86	86	70-130	0	20
Lithium	mg/L	0.21	1	1	1.3	1.3	112	114	70-130	1	20

MATRIX SPIKE SAMPLE: 1884144

Parameter	Units	60234727003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.031	2	2.2	107	70-130	
Beryllium	mg/L	<0.0010	2	2.1	106	70-130	
Boron	mg/L	3.6	2	5.6	104	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

MATRIX SPIKE SAMPLE:		1884144					
Parameter	Units	60234727003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	291	20	317	128	70-130	
Chromium	mg/L	<0.0050	2	2.0	98	70-130	
Lead	mg/L	<0.0050	2	1.8	92	70-130	
Lithium	mg/L	0.016	2	2.3	116	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 458956 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1878817 Matrix: Water
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	12/15/16 15:52	
Arsenic	mg/L	<0.0010	0.0010	12/15/16 15:52	
Cadmium	mg/L	<0.00050	0.00050	12/15/16 15:52	
Cobalt	mg/L	<0.0010	0.0010	12/15/16 15:52	
Molybdenum	mg/L	<0.0010	0.0010	12/15/16 15:52	
Selenium	mg/L	<0.0010	0.0010	12/16/16 10:48	
Thallium	mg/L	<0.0010	0.0010	12/15/16 15:52	

LABORATORY CONTROL SAMPLE: 1878818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.039	97	85-115	
Cadmium	mg/L	.04	0.039	98	85-115	
Cobalt	mg/L	.04	0.040	100	85-115	
Molybdenum	mg/L	.04	0.041	102	85-115	
Selenium	mg/L	.04	0.039	97	85-115	
Thallium	mg/L	.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1878819 1878820

Parameter	Units	7555997001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	0.22J ug/L	.04	.04	0.039	0.039	98	97	70-130	1	20		
Arsenic	mg/L	1.6 ug/L	.04	.04	0.040	0.040	97	96	70-130	1	20		
Cadmium	mg/L	<0.029 ug/L	.04	.04	0.038	0.037	96	94	70-130	2	20		
Cobalt	mg/L	<0.50 ug/L	.04	.04	0.038	0.037	95	93	70-130	2	20		
Molybdenum	mg/L	0.52J ug/L	.04	.04	0.042	0.041	103	101	70-130	2	20		
Selenium	mg/L	0.00040J	.04	.04	0.038	0.037	93	93	70-130	1	20		
Thallium	mg/L	<0.00050	.04	.04	0.035	0.035	88	87	70-130	1	20		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 458970

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1878871

Matrix: Water

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	12/14/16 15:59	

LABORATORY CONTROL SAMPLE: 1878872

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	987	99	80-120	

SAMPLE DUPLICATE: 1878873

Parameter	Units	60234023001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3710	3600	3	10	

SAMPLE DUPLICATE: 1878874

Parameter	Units	60234140005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2370	2340	1	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 459375 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

SAMPLE DUPLICATE: 1880973

Parameter	Units	60234060001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	4.9	4.8	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 460862 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1886368 Matrix: Water
 Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	12/30/16 14:18	
Sulfate	mg/L	<1.0	1.0	12/30/16 14:18	

LABORATORY CONTROL SAMPLE: 1886369

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1886370 1886371

Parameter	Units	60234820001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	44.9	250	250	333	339	115	118	80-120	2	15	
Sulfate	mg/L	ND	500	500	640	652	115	117	80-120	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 460929

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1886597

Matrix: Water

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	12/31/16 10:35	

LABORATORY CONTROL SAMPLE: 1886598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1886599 1886600

Parameter	Units	60234820005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2530	1000	1000	3560	3210	103	68	80-120	10	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 460941 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60234133002, 60234133003, 60234133004

METHOD BLANK: 1886758 Matrix: Water
 Associated Lab Samples: 60234133002, 60234133003, 60234133004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<1.0	1.0	01/03/17 08:52	

LABORATORY CONTROL SAMPLE: 1886759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1886760 1886761

Parameter	Units	2047600001 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	6.4	6.5	108	111	80-120	2	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-32-121216 **Lab ID: 60234133001** Collected: 12/12/16 10:56 Received: 12/12/16 17:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.64 ± 1.08 (0.615) C:NA T:93%	pCi/L	01/11/17 22:47	13982-63-3	
Radium-228	EPA 904.0	3.12 ± 0.845 (0.937) C:63% T:86%	pCi/L	01/12/17 11:41	15262-20-1	
Total Radium	Total Radium Calculation	6.76 ± 1.93 (1.55)	pCi/L	01/17/17 16:46	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-31R-121216 **Lab ID: 60234133002** Collected: 12/12/16 12:24 Received: 12/12/16 17:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	11.7 ± 2.19 (0.827) C:NA T:94%	pCi/L	01/11/17 22:47	13982-63-3	
Radium-228	EPA 904.0	18.4 ± 3.54 (0.919) C:59% T:84%	pCi/L	01/12/17 11:41	15262-20-1	
Total Radium	Total Radium Calculation	30.1 ± 5.73 (1.75)	pCi/L	01/17/17 16:46	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-33-121216 **Lab ID: 60234133003** Collected: 12/12/16 13:34 Received: 12/12/16 17:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.99 ± 1.17 (0.533) C:NA T:87%	pCi/L	01/11/17 22:54	13982-63-3	
Radium-228	EPA 904.0	11.8 ± 2.36 (0.920) C:59% T:81%	pCi/L	01/12/17 11:41	15262-20-1	
Total Radium	Total Radium Calculation	15.8 ± 3.53 (1.45)	pCi/L	01/17/17 16:46	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: MW-34-121216 **Lab ID: 60234133004** Collected: 12/12/16 15:15 Received: 12/12/16 17:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	9.25 ± 1.85 (0.463) C:NA T:93%	pCi/L	01/11/17 22:47	13982-63-3	
Radium-228	EPA 904.0	12.1 ± 2.43 (0.961) C:59% T:81%	pCi/L	01/12/17 11:41	15262-20-1	
Total Radium	Total Radium Calculation	21.4 ± 4.28 (1.42)	pCi/L	01/17/17 16:46	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Sample: DUP-121216 **Lab ID: 60234133005** Collected: 12/12/16 06:00 Received: 12/12/16 17:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.43 ± 1.04 (0.601) C:NA T:94%	pCi/L	01/11/17 22:47	13982-63-3	
Radium-228	EPA 904.0	1.91 ± 0.590 (0.746) C:67% T:89%	pCi/L	01/12/17 11:41	15262-20-1	
Total Radium	Total Radium Calculation	5.34 ± 1.63 (1.35)	pCi/L	01/17/17 16:46	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 245319

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1207368

Matrix: Water

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.300 ± 0.437 (0.941) C:71% T:73%	pCi/L	01/12/17 11:39	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60234133

QC Batch: 245318

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

METHOD BLANK: 1207364

Matrix: Water

Associated Lab Samples: 60234133001, 60234133002, 60234133003, 60234133004, 60234133005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0718 ± 0.328 (0.528) C:NA T:87%	pCi/L	01/11/17 21:46	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60234133

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60234133001	MW-32-121216	EPA 200.7	460236	EPA 200.7	460373
60234133002	MW-31R-121216	EPA 200.7	460236	EPA 200.7	460373
60234133003	MW-33-121216	EPA 200.7	460236	EPA 200.7	460373
60234133004	MW-34-121216	EPA 200.7	460236	EPA 200.7	460373
60234133005	DUP-121216	EPA 200.7	460236	EPA 200.7	460373
60234133001	MW-32-121216	EPA 200.8	458956	EPA 200.8	459014
60234133002	MW-31R-121216	EPA 200.8	458956	EPA 200.8	459014
60234133003	MW-33-121216	EPA 200.8	458956	EPA 200.8	459014
60234133004	MW-34-121216	EPA 200.8	458956	EPA 200.8	459014
60234133005	DUP-121216	EPA 200.8	458956	EPA 200.8	459014
60234133001	MW-32-121216	EPA 245.1	458789	EPA 245.1	458816
60234133002	MW-31R-121216	EPA 245.1	458789	EPA 245.1	458816
60234133003	MW-33-121216	EPA 245.1	458789	EPA 245.1	458816
60234133004	MW-34-121216	EPA 245.1	458789	EPA 245.1	458816
60234133005	DUP-121216	EPA 245.1	458789	EPA 245.1	458816
60234133001	MW-32-121216	EPA 903.1	245318		
60234133002	MW-31R-121216	EPA 903.1	245318		
60234133003	MW-33-121216	EPA 903.1	245318		
60234133004	MW-34-121216	EPA 903.1	245318		
60234133005	DUP-121216	EPA 903.1	245318		
60234133001	MW-32-121216	EPA 904.0	245319		
60234133002	MW-31R-121216	EPA 904.0	245319		
60234133003	MW-33-121216	EPA 904.0	245319		
60234133004	MW-34-121216	EPA 904.0	245319		
60234133005	DUP-121216	EPA 904.0	245319		
60234133001	MW-32-121216	Total Radium Calculation	246675		
60234133002	MW-31R-121216	Total Radium Calculation	246675		
60234133003	MW-33-121216	Total Radium Calculation	246675		
60234133004	MW-34-121216	Total Radium Calculation	246675		
60234133005	DUP-121216	Total Radium Calculation	246675		
60234133001	MW-32-121216	SM 2540C	458970		
60234133002	MW-31R-121216	SM 2540C	458970		
60234133003	MW-33-121216	SM 2540C	458970		
60234133004	MW-34-121216	SM 2540C	458970		
60234133005	DUP-121216	SM 2540C	458970		
60234133001	MW-32-121216	SM 4500-H+B	459375		
60234133002	MW-31R-121216	SM 4500-H+B	459375		
60234133003	MW-33-121216	SM 4500-H+B	459375		
60234133004	MW-34-121216	SM 4500-H+B	459375		
60234133005	DUP-121216	SM 4500-H+B	459375		
60234133001	MW-32-121216	EPA 300.0	460862		
60234133001	MW-32-121216	EPA 300.0	460929		
60234133002	MW-31R-121216	EPA 300.0	460862		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60234133

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60234133002	MW-31R-121216	EPA 300.0	460929		
60234133002	MW-31R-121216	EPA 300.0	460941		
60234133003	MW-33-121216	EPA 300.0	460862		
60234133003	MW-33-121216	EPA 300.0	460929		
60234133003	MW-33-121216	EPA 300.0	460941		
60234133004	MW-34-121216	EPA 300.0	460862		
60234133004	MW-34-121216	EPA 300.0	460929		
60234133004	MW-34-121216	EPA 300.0	460941		
60234133005	DUP-121216	EPA 300.0	460862		
60234133005	DUP-121216	EPA 300.0	460929		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60234133



Client Name: WCS Star

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-266 ^{CF +0.7} ^{CF -0.5} / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 3.1 Corr. Factor ^{CF +0.7} ^{CF -0.5} Corrected 3.8

Date and initials of person examining contents:

PV 12/13/16

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review:

REVIEWED
By HMW at 10:37 am, 12/13/16

Date: _____



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: WESTAR ENERGY		Report To: Brandon Griffin		Attention: Jared Morrison	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison, Heath Horyna		Company Name: WESTAR ENERGY	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.:		Address: SEE SECTION A	
Phone: (785) 575-8135 Fax:		Project Name: LEC CCR Groundwater		Pace Quote Reference:	
Requested Due Date/TAT: 7 DAY		Project Number:		Pace Project Manager: Heather Wilson, 913-563-1407	
				Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input checked="" type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
				Site Location: KS	
				STATE: KS	

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / , -) Sample IDs MUST BE UNIQUE	Valid Matrix Codes		COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		MATRIX	MATRIX CODE	COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	Analysis Test ↓	200.7 Total Metals*	200.8 Total Metals**	245.1 Total Mercury	300.0 Cl, F, SO ₄	4500 H+B	2540C TDS	Radium 226	Radium 228					
				DATE	TIME	DATE	TIME																								
1	MW-32-121216	DRINKING WATER	DW			12/12/16	1056		4	1	3																1802W 1802W 2801W w/				
2	MW-31R-121216	WATER	WW			12/12/16	1224		4	1	3																↓ w/				
3	MW-33-121216	WASTE WATER	SL			12/12/16	1334		4	1	3																↓ w/				
4	MW-34-121216	PRODUCT SOIL/SOLID	WP			12/12/16	1575		4	1	3																↓ w/				
5																															
6																															
7																															
8																															
9																															
10																															
11	Dup-121216	OTHER	OT			12/12/16	0600		4	1	3																↓ w/				
12																															

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS			
*200.7 Total Metals: Ba, Be, B, Ca, Cr, Pb, Li		BJS / Westar		12/12/16	1630	[Signature]		12/12/16	1725	3-0	Y	Y	Y
**200.8 Total Metals: Co, As, Se, Mo, Cd, Sb, 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: Brandon Griffin		SIGNATURE of SAMPLER: [Signature]					
		DATE Signed (MM/DD/YY): 12/12/16					

Page 31 of 33

*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.

Sample Condition Upon Receipt Pittsburgh

30205492



Client Name: Pace Kansas

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7044 6057 6578

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 12-14-16

Comments:

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

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.

ATTACHMENT 1-5
February 2017 Sampling Event
Laboratory Analytical Report

March 07, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60237344

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on February 06, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60237344001	MW-32-020617	Water	02/06/17 09:47	02/06/17 15:15
60237344002	MW-31R-020617	Water	02/06/17 10:51	02/06/17 15:15
60237344003	MW-33-020617	Water	02/06/17 12:04	02/06/17 15:15
60237344004	MW-34-020617	Water	02/06/17 13:06	02/06/17 15:15
60237344005	DUP-020617	Water	02/06/17 06:00	02/06/17 15:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60237344001	MW-32-020617	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JMC1	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60237344002	MW-31R-020617	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	OL	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60237344003	MW-33-020617	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	OL	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60237344004	MW-34-020617	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	OL	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60237344005	DUP-020617	EPA 200.7	JGP	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JMC1	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-32-020617	Lab ID: 60237344001	Collected: 02/06/17 09:47	Received: 02/06/17 15:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.32	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:05	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 15:05	7440-41-7	
Boron, Total Recoverable	0.18	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:05	7440-42-8	
Calcium, Total Recoverable	61.9	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:05	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:05	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:05	7439-92-1	
Lithium	0.012	mg/L	0.010	1	02/08/17 11:30	02/09/17 15:05	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	02/08/17 11:30	02/09/17 16:44	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7440-48-4	
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:44	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	02/13/17 12:00	02/13/17 15:37	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	487	mg/L	5.0	1		02/09/17 15:39		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		02/13/17 12:58		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	94.4	mg/L	10.0	10		02/10/17 18:11	16887-00-6	
Fluoride	0.21	mg/L	0.20	1		02/07/17 18:39	16984-48-8	
Sulfate	7.0	mg/L	1.0	1		02/07/17 18:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-31R-020617	Lab ID: 60237344002	Collected: 02/06/17 10:51	Received: 02/06/17 15:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.29	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:11	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 15:11	7440-41-7	
Boron, Total Recoverable	0.63	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:11	7440-42-8	
Calcium, Total Recoverable	229	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:11	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:11	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:11	7439-92-1	
Lithium	0.11	mg/L	0.010	1	02/08/17 11:30	02/09/17 15:11	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	02/08/17 11:30	02/09/17 16:47	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7440-48-4	
Molybdenum, Total Recoverable	0.0027	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:47	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	02/13/17 12:00	02/13/17 15:39	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	7400	mg/L	5.0	1		02/09/17 15:40		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		02/11/17 09:10		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	3970	mg/L	500	500		02/10/17 19:18	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		02/07/17 18:53	16984-48-8	
Sulfate	140	mg/L	10.0	10		02/10/17 19:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-33-020617		Lab ID: 60237344003		Collected: 02/06/17 12:04		Received: 02/06/17 15:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.16	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:14	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 15:14	7440-41-7		
Boron, Total Recoverable	1.7	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:14	7440-42-8		
Calcium, Total Recoverable	260	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:14	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:14	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:14	7439-92-1		
Lithium	0.22	mg/L	0.010	1	02/08/17 11:30	02/09/17 15:14	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7440-36-0		
Arsenic, Total Recoverable	0.0022	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	02/08/17 11:30	02/09/17 16:51	7440-43-9		
Cobalt, Total Recoverable	0.0014	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7440-48-4		
Molybdenum, Total Recoverable	0.0053	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:51	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	02/13/17 12:00	02/13/17 15:40	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	12400	mg/L	5.0	1		02/09/17 15:40			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.5	Std. Units	0.10	1		02/11/17 09:11		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7320	mg/L	500	500		02/10/17 19:44	16887-00-6		
Fluoride	<0.20	mg/L	0.20	1		02/07/17 19:07	16984-48-8		
Sulfate	307	mg/L	20.0	20		02/10/17 19:31	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-34-020617	Lab ID: 60237344004	Collected: 02/06/17 13:06	Received: 02/06/17 15:15	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.16	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:16	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 15:16	7440-41-7	
Boron, Total Recoverable	2.0	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:16	7440-42-8	
Calcium, Total Recoverable	232	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:16	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:16	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:16	7439-92-1	
Lithium	0.22	mg/L	0.010	1	02/08/17 11:30	02/09/17 15:16	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7440-36-0	
Arsenic, Total Recoverable	0.0030	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	02/08/17 11:30	02/09/17 16:55	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7440-48-4	
Molybdenum, Total Recoverable	0.0060	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:55	7440-28-0	
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.00020	mg/L	0.00020	1	02/13/17 12:00	02/13/17 15:42	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	12100	mg/L	5.0	1		02/09/17 15:41		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.6	Std. Units	0.10	1		02/11/17 09:13		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	6470	mg/L	500	500		02/10/17 20:11	16887-00-6	
Fluoride	1.1	mg/L	0.20	1		02/07/17 19:21	16984-48-8	
Sulfate	490	mg/L	50.0	50		02/10/17 19:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: DUP-020617		Lab ID: 60237344005	Collected: 02/06/17 06:00	Received: 02/06/17 15:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.30	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:19	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 15:19	7440-41-7	
Boron, Total Recoverable	0.64	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:19	7440-42-8	
Calcium, Total Recoverable	234	mg/L	0.10	1	02/08/17 11:30	02/09/17 15:19	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:19	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	02/08/17 11:30	02/09/17 15:19	7439-92-1	
Lithium	0.12	mg/L	0.010	1	02/08/17 11:30	02/09/17 15:19	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	02/08/17 11:30	02/09/17 16:58	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7440-48-4	
Molybdenum, Total Recoverable	0.0024	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	02/08/17 11:30	02/09/17 16:58	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	02/13/17 12:00	02/13/17 15:43	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	8000	mg/L	5.0	1		02/09/17 15:41		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		02/13/17 12:50		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	3980	mg/L	500	500		02/10/17 20:38	16887-00-6	
Fluoride	0.45	mg/L	0.20	1		02/07/17 19:35	16984-48-8	
Sulfate	140	mg/L	10.0	10		02/10/17 20:25	14808-79-8	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 465226 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1904490 Matrix: Water
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	02/13/17 15:14	

LABORATORY CONTROL SAMPLE: 1904491

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0052	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1904492 1904493

Parameter	Units	60237627001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	<0.20 ug/L	.005	.005	0.0051	0.0049	99	96	70-130	3	20	

MATRIX SPIKE SAMPLE: 1904494

Parameter	Units	60237408004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.00020	.005	0.0053	105	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60237344

QC Batch: 464776 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1902178 Matrix: Water
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	02/09/17 15:00	
Beryllium	mg/L	<0.0010	0.0010	02/09/17 15:00	
Boron	mg/L	<0.10	0.10	02/09/17 15:00	
Calcium	mg/L	<0.10	0.10	02/09/17 15:00	
Chromium	mg/L	<0.0050	0.0050	02/09/17 15:00	
Lead	mg/L	<0.0050	0.0050	02/09/17 15:00	
Lithium	mg/L	<0.010	0.010	02/09/17 15:00	

LABORATORY CONTROL SAMPLE: 1902179

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.1	107	85-115	
Beryllium	mg/L	1	1.1	106	85-115	
Boron	mg/L	1	0.97	97	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	1.0	100	85-115	
Lead	mg/L	1	0.98	98	85-115	
Lithium	mg/L	1	1.1	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1902180 1902181

Parameter	Units	60237344001		1902180		1902181		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.32	1	1	1	1.4	1.3	109	102	70-130	5	20	
Beryllium	mg/L	<0.0010	1	1	1	1.1	1.0	109	103	70-130	5	20	
Boron	mg/L	0.18	1	1	1	1.2	1.2	101	98	70-130	3	20	
Calcium	mg/L	61.9	10	10	10	73.6	70.6	117	87	70-130	4	20	
Chromium	mg/L	<0.0050	1	1	1	1.0	0.98	102	98	70-130	4	20	
Lead	mg/L	<0.0050	1	1	1	0.97	0.94	97	93	70-130	4	20	
Lithium	mg/L	0.012	1	1	1	1.1	1.1	110	104	70-130	6	20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60237344

QC Batch: 464778 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1902182 Matrix: Water
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	02/13/17 12:02	
Arsenic	mg/L	<0.0010	0.0010	02/13/17 12:02	
Cadmium	mg/L	<0.00050	0.00050	02/13/17 12:02	
Cobalt	mg/L	<0.0010	0.0010	02/13/17 12:02	
Molybdenum	mg/L	<0.0010	0.0010	02/13/17 12:02	
Selenium	mg/L	<0.0010	0.0010	02/13/17 12:02	
Thallium	mg/L	<0.0010	0.0010	02/13/17 12:02	

LABORATORY CONTROL SAMPLE: 1902183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.038	96	85-115	
Arsenic	mg/L	.04	0.039	98	85-115	
Cadmium	mg/L	.04	0.039	98	85-115	
Cobalt	mg/L	.04	0.039	96	85-115	
Molybdenum	mg/L	.04	0.041	102	85-115	
Selenium	mg/L	.04	0.039	99	85-115	
Thallium	mg/L	.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1902184 1902185

Parameter	Units	60237356001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	0.25J ug/L	.04	.04	0.039	0.039	96	97	70-130	1	20		
Arsenic	mg/L	<0.052 ug/L	.04	.04	0.039	0.039	98	97	70-130	1	20		
Cadmium	mg/L	<0.018 ug/L	.04	.04	0.038	0.039	95	97	70-130	3	20		
Cobalt	mg/L	0.24J ug/L	.04	.04	0.037	0.038	92	94	70-130	3	20		
Molybdenum	mg/L	0.73J ug/L	.04	.04	0.042	0.042	102	104	70-130	1	20		
Selenium	mg/L	<0.086 ug/L	.04	.04	0.039	0.038	96	96	70-130	1	20		
Thallium	mg/L	<0.036 ug/L	.04	.04	0.036	0.037	90	92	70-130	2	20		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

MATRIX SPIKE SAMPLE:		1902186					
Parameter	Units	60237356002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	1.4 ug/L	.04	0.040	96	70-130	
Arsenic	mg/L	2.9 ug/L	.04	0.042	97	70-130	
Cadmium	mg/L	1.7 ug/L	.04	0.039	94	70-130	
Cobalt	mg/L	31.0 ug/L	.04	0.067	89	70-130	
Molybdenum	mg/L	7.0 ug/L	.04	0.048	101	70-130	
Selenium	mg/L	<0.086 ug/L	.04	0.038	96	70-130	
Thallium	mg/L	0.16J ug/L	.04	0.036	90	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 464879 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1902679 Matrix: Water
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	02/09/17 15:35	

LABORATORY CONTROL SAMPLE: 1902680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1020	102	80-120	

SAMPLE DUPLICATE: 1902681

Parameter	Units	60237373003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	445	441	1	10	

SAMPLE DUPLICATE: 1902682

Parameter	Units	60237344005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8000	7700	4	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 464959 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60237344001, 60237344005

SAMPLE DUPLICATE: 1903138

Parameter	Units	60237044003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.3	6.3	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 465132 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60237344002, 60237344003, 60237344004

SAMPLE DUPLICATE: 1903941

Parameter	Units	40145474001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60237344

QC Batch: 464603 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1901494 Matrix: Water
Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	02/07/17 14:43	
Sulfate	mg/L	<1.0	1.0	02/07/17 14:43	

LABORATORY CONTROL SAMPLE: 1901495

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	98	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1901496 1901497

Parameter	Units	60237325001		1901497		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/L	ND	500	500	538	103	104	80-120	1	15	
Sulfate	mg/L	ND	1000	1000	1040	104	105	80-120	1	15	

MATRIX SPIKE SAMPLE: 1901498

Parameter	Units	60237326001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	500	522	102	80-120	
Sulfate	mg/L	ND	1000	1040	104	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 465064 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1903647 Matrix: Water
 Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	02/10/17 15:16	
Sulfate	mg/L	<1.0	1.0	02/10/17 15:16	

LABORATORY CONTROL SAMPLE: 1903648

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1903649 1903650

Parameter	Units	60237278001		1903649		1903650		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	918	500	500	1530	1510	122	118	80-120	1	15 M1
Sulfate	mg/L	589	500	500	1160	1140	115	110	80-120	2	15

MATRIX SPIKE SAMPLE: 1903651

Parameter	Units	60237344001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	94.4	50	146	104	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-32-020617 **Lab ID: 60237344001** Collected: 02/06/17 09:47 Received: 02/06/17 15:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.70 ± 0.832 (0.998) C:NA T:90%	pCi/L	03/01/17 10:11	13982-63-3	
Radium-228	EPA 904.0	2.07 ± 0.713 (1.01) C:69% T:76%	pCi/L	03/01/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	3.77 ± 1.55 (2.01)	pCi/L	03/06/17 15:45	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-31R-020617 **Lab ID: 60237344002** Collected: 02/06/17 10:51 Received: 02/06/17 15:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	4.28 ± 1.20 (0.631) C:NA T:86%	pCi/L	03/01/17 10:11	13982-63-3	
Radium-228	EPA 904.0	15.6 ± 3.01 (0.938) C:69% T:83%	pCi/L	03/01/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	19.9 ± 4.21 (1.57)	pCi/L	03/06/17 15:45	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-33-020617 **Lab ID: 60237344003** Collected: 02/06/17 12:04 Received: 02/06/17 15:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	10.3 ± 2.07 (0.522) C:NA T:91%	pCi/L	03/01/17 10:11	13982-63-3	
Radium-228	EPA 904.0	11.0 ± 2.19 (0.882) C:71% T:80%	pCi/L	03/01/17 15:17	15262-20-1	
Total Radium	Total Radium Calculation	21.3 ± 4.26 (1.40)	pCi/L	03/06/17 15:45	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: MW-34-020617 **Lab ID: 60237344004** Collected: 02/06/17 13:06 Received: 02/06/17 15:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	10.0 ± 2.00 (0.896) C:NA T:95%	pCi/L	03/01/17 10:11	13982-63-3	
Radium-228	EPA 904.0	10.8 ± 2.14 (0.860) C:70% T:79%	pCi/L	03/01/17 15:17	15262-20-1	
Total Radium	Total Radium Calculation	20.8 ± 4.14 (1.76)	pCi/L	03/06/17 15:45	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Sample: DUP-020617 **Lab ID: 60237344005** Collected: 02/06/17 06:00 Received: 02/06/17 15:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	5.10 ± 1.33 (0.521) C:NA T:83%	pCi/L	03/01/17 10:11	13982-63-3	
Radium-228	EPA 904.0	14.6 ± 2.81 (0.878) C:73% T:83%	pCi/L	03/01/17 15:17	15262-20-1	
Total Radium	Total Radium Calculation	19.7 ± 4.14 (1.40)	pCi/L	03/06/17 15:45	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60237344

QC Batch: 249974

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

METHOD BLANK: 1229857

Matrix: Water

Associated Lab Samples: 60237344001, 60237344002, 60237344003, 60237344004, 60237344005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.186 ± 0.284 (0.746) C:NA T:93%	pCi/L	03/01/17 10:11	

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: LEC CCR Groundwater

Pace Project No.: 60237344

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60237344001	MW-32-020617	EPA 200.7	464776	EPA 200.7	464816
60237344002	MW-31R-020617	EPA 200.7	464776	EPA 200.7	464816
60237344003	MW-33-020617	EPA 200.7	464776	EPA 200.7	464816
60237344004	MW-34-020617	EPA 200.7	464776	EPA 200.7	464816
60237344005	DUP-020617	EPA 200.7	464776	EPA 200.7	464816
60237344001	MW-32-020617	EPA 200.8	464778	EPA 200.8	464815
60237344002	MW-31R-020617	EPA 200.8	464778	EPA 200.8	464815
60237344003	MW-33-020617	EPA 200.8	464778	EPA 200.8	464815
60237344004	MW-34-020617	EPA 200.8	464778	EPA 200.8	464815
60237344005	DUP-020617	EPA 200.8	464778	EPA 200.8	464815
60237344001	MW-32-020617	EPA 245.1	465226	EPA 245.1	465325
60237344002	MW-31R-020617	EPA 245.1	465226	EPA 245.1	465325
60237344003	MW-33-020617	EPA 245.1	465226	EPA 245.1	465325
60237344004	MW-34-020617	EPA 245.1	465226	EPA 245.1	465325
60237344005	DUP-020617	EPA 245.1	465226	EPA 245.1	465325
60237344001	MW-32-020617	EPA 903.1	249974		
60237344002	MW-31R-020617	EPA 903.1	249974		
60237344003	MW-33-020617	EPA 903.1	249974		
60237344004	MW-34-020617	EPA 903.1	249974		
60237344005	DUP-020617	EPA 903.1	249974		
60237344001	MW-32-020617	EPA 904.0	250052		
60237344002	MW-31R-020617	EPA 904.0	250052		
60237344003	MW-33-020617	EPA 904.0	250052		
60237344004	MW-34-020617	EPA 904.0	250052		
60237344005	DUP-020617	EPA 904.0	250052		
60237344001	MW-32-020617	Total Radium Calculation	251222		
60237344002	MW-31R-020617	Total Radium Calculation	251222		
60237344003	MW-33-020617	Total Radium Calculation	251222		
60237344004	MW-34-020617	Total Radium Calculation	251222		
60237344005	DUP-020617	Total Radium Calculation	251222		
60237344001	MW-32-020617	SM 2540C	464879		
60237344002	MW-31R-020617	SM 2540C	464879		
60237344003	MW-33-020617	SM 2540C	464879		
60237344004	MW-34-020617	SM 2540C	464879		
60237344005	DUP-020617	SM 2540C	464879		
60237344001	MW-32-020617	SM 4500-H+B	464959		
60237344002	MW-31R-020617	SM 4500-H+B	465132		
60237344003	MW-33-020617	SM 4500-H+B	465132		
60237344004	MW-34-020617	SM 4500-H+B	465132		
60237344005	DUP-020617	SM 4500-H+B	464959		
60237344001	MW-32-020617	EPA 300.0	464603		
60237344001	MW-32-020617	EPA 300.0	465064		
60237344002	MW-31R-020617	EPA 300.0	464603		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60237344

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60237344002	MW-31R-020617	EPA 300.0	465064		
60237344003	MW-33-020617	EPA 300.0	464603		
60237344003	MW-33-020617	EPA 300.0	465064		
60237344004	MW-34-020617	EPA 300.0	464603		
60237344004	MW-34-020617	EPA 300.0	465064		
60237344005	DUP-020617	EPA 300.0	464603		
60237344005	DUP-020617	EPA 300.0	465064		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60237344



60237344

Client Name: Wester Energy

Courier: FedEx UPS VIA Clay PEX ECI Pace ^{Scott} Xroads Client Other

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-266 / T-239 ^{CF +1.5} ^{CF +0.9} Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.2, 1.6 Corr. Factor CF +1.5 ^{CF +0.9} Corrected 2.7, 3.1

Date and initials of person examining contents: 1525
2/6/17

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Amw Date: 2/6/17



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: WESTAR ENERGY		Report To: Brandon Griffin		Attention: Jared Morrison	
Address: 818 Kansas Ave Topeka, KS 66612		Copy To: Jared Morrison, Heath Horyna		Company Name: WESTAR ENERGY	
Email To: brandon.l.griffin@westarenergy.com		Purchase Order No.:		Address: SEE SECTION A	
Phone: (785) 575-8135 Fax:		Project Name: LEC CCR Groundwater		Pace Quote Reference:	
Requested Due Date/TAT: 7 DAY		Project Number:		Pace Project Manager: Heather Wilson, 913-563-1407	
				Pace Profile #: 9655, 1	
				REGULATORY AGENCY	
				<input checked="" type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
				Site Location: KS	
				STATE: _____	

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 SOILSOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.					
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	Preservatives											Analysis Test ↓				
					DATE	TIME	DATE	TIME				H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol	Other	200.7 Total Metals*	200.8 Total Metals**				245.1 Total Mercury	300.0 Cl, F, SO ₄	4500 H+B	2540C TDS
1	MW-32-020617		WTG	G			2/6/17	0947	4	1	3														001	(BPN) (BPN) 2(BPN)	
2	MW-31R-020617		WTG	G			2/6/17	1051	4	1	3														002		
3	MW-33-020617		WTG	G			2/6/17	1204	4	1	3														003		
4	MW-34-020617		WTG	G			2/6/17	1306	4	1	3														004		
5																											
6																											
7																											
8																											
9																											
10	DUP-020617		WTG	G			2/6/17	0600	4	1	3														005	(BPN) (BPN) 2(BPN)	
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*200.7 Total Metals: Ba, Be, B, Ca, Cr, Pb, Li	BGG/Westar	2/6/17	1345	JM/Star	2/6/17	1515	2.7	Y	Y	Y
**200.8 Total Metals: Co, As, Se, Mo, Cd, Sb, Tl							3.1	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: Brandon Griffin							
SIGNATURE of SAMPLER: BGG			DATE Signed (MM/DD/YY): 02/06/17				

Page 31 of 33

*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.

Sample Condition Upon Receipt Pittsburgh

30210116



Client Name: Pace Kansas Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7094 6659 3526

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: ML 2-8-17

Comments:

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

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

ATTACHMENT 1-6
March 2017 Sampling Event
Laboratory Analytical Report

April 25, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR GROUNDWATER
Pace Project No.: 60241031

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on April 01, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60241031001	MW-35-033117	Water	03/31/17 17:05	04/01/17 10:10

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60241031001	MW-35-033117	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

Sample: MW-35-033117 **Lab ID: 60241031001** Collected: 03/31/17 17:05 Received: 04/01/17 10:10 Matrix: Water

Comments: • Per the client's request, the sample ID on this sample was changed from MW-32A-033117 was changed to MW-35-033117.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.085	mg/L	0.0050	1	04/05/17 10:55	04/06/17 16:52	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/05/17 10:55	04/06/17 16:52	7440-41-7	
Boron, Total Recoverable	1.5	mg/L	0.10	1	04/05/17 10:55	04/06/17 16:52	7440-42-8	
Calcium, Total Recoverable	407	mg/L	0.10	1	04/05/17 10:55	04/06/17 16:52	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/05/17 10:55	04/06/17 16:52	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/05/17 10:55	04/06/17 16:52	7439-92-1	
Lithium	0.40	mg/L	0.010	1	04/05/17 10:55	04/06/17 16:52	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0020	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7440-36-0	D3
Arsenic, Total Recoverable	<0.0020	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7440-38-2	D3
Cadmium, Total Recoverable	<0.0010	mg/L	0.0010	2	04/04/17 10:10	04/06/17 12:19	7440-43-9	D3
Cobalt, Total Recoverable	0.0042	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7440-48-4	
Molybdenum, Total Recoverable	0.0077	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7439-98-7	
Selenium, Total Recoverable	<0.0020	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7782-49-2	D3
Thallium, Total Recoverable	<0.0020	mg/L	0.0020	2	04/04/17 10:10	04/06/17 12:19	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 15:38	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	23100	mg/L	5.0	1		04/03/17 14:46		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.4	Std. Units	0.10	1		04/07/17 13:05		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	12200	mg/L	1000	1000		04/05/17 21:14	16887-00-6	
Fluoride	<0.20	mg/L	0.20	1		04/05/17 05:29	16984-48-8	
Sulfate	621	mg/L	50.0	50		04/05/17 21:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 471585	Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1	Analysis Description: 245.1 Mercury
Associated Lab Samples: 60241031001	

METHOD BLANK: 1930972 Matrix: Water
Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	04/06/17 14:39	

LABORATORY CONTROL SAMPLE: 1930973

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0044	88	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930974 1930975

Parameter	Units	60240647001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	mg/L	ND	.005	.005	0.0036	0.0035	73	70	70-130	4	20	

MATRIX SPIKE SAMPLE: 1930976

Parameter	Units	60240750001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	3.5 ug/L	.005	0.0047	24	70-130	M1

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER
Pace Project No.: 60241031

QC Batch: 471389 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60241031001

METHOD BLANK: 1930095 Matrix: Water
Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	04/06/17 15:39	
Beryllium	mg/L	<0.0010	0.0010	04/06/17 15:39	
Boron	mg/L	<0.10	0.10	04/06/17 15:39	
Calcium	mg/L	<0.10	0.10	04/06/17 15:39	
Chromium	mg/L	<0.0050	0.0050	04/06/17 15:39	
Lead	mg/L	<0.0050	0.0050	04/06/17 15:39	
Lithium	mg/L	<0.010	0.010	04/06/17 15:39	

LABORATORY CONTROL SAMPLE: 1930096

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	104	85-115	
Beryllium	mg/L	1	1.0	104	85-115	
Boron	mg/L	1	0.99	99	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	1.0	101	85-115	
Lead	mg/L	1	1.0	103	85-115	
Lithium	mg/L	1	1.0	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930097 1930098

Parameter	Units	60240834001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	211 ug/L	1	1	1.2	1.2	104	104	70-130	0	20		
Beryllium	mg/L	ND	1	1	1.1	1.1	106	106	70-130	1	20		
Boron	mg/L	137 ug/L	1	1	1.2	1.2	104	104	70-130	0	20		
Calcium	mg/L	48600 ug/L	10	10	58.4	58.5	98	100	70-130	0	20		
Chromium	mg/L	ND	1	1	1.0	1.0	102	104	70-130	2	20		
Lead	mg/L	ND	1	1	1.0	1.0	103	104	70-130	2	20		
Lithium	mg/L	33.0 ug/L	1	1	1.1	1.1	104	104	70-130	0	20		

MATRIX SPIKE SAMPLE: 1930099

Parameter	Units	60241107004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	97.6 ug/L	1	1.2	108	70-130	
Beryllium	mg/L	ND	1	1.1	110	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

MATRIX SPIKE SAMPLE:		1930099					
Parameter	Units	60241107004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	ND	1	1.1	107	70-130	
Calcium	mg/L	51600 ug/L	10	62.5	108	70-130	
Chromium	mg/L	ND	1	1.1	105	70-130	
Lead	mg/L	ND	1	1.1	106	70-130	
Lithium	mg/L	23.5 ug/L	1	1.1	107	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 471205

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET

Associated Lab Samples: 60241031001

METHOD BLANK: 1929264

Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	04/05/17 12:38	
Arsenic	mg/L	<0.0010	0.0010	04/05/17 12:38	
Cadmium	mg/L	<0.00050	0.00050	04/05/17 12:38	
Cobalt	mg/L	<0.0010	0.0010	04/05/17 12:38	
Molybdenum	mg/L	<0.0010	0.0010	04/05/17 12:38	
Selenium	mg/L	<0.0010	0.0010	04/05/17 12:38	
Thallium	mg/L	<0.0010	0.0010	04/05/17 12:38	

LABORATORY CONTROL SAMPLE: 1929265

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.039	98	85-115	
Cadmium	mg/L	.04	0.040	100	85-115	
Cobalt	mg/L	.04	0.040	99	85-115	
Molybdenum	mg/L	.04	0.042	105	85-115	
Selenium	mg/L	.04	0.038	96	85-115	
Thallium	mg/L	.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1929266 1929267

Parameter	Units	7562883001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Antimony	mg/L	0.14J ug/L	.04	.04	0.041	0.041	102	103	70-130	0	20	
Arsenic	mg/L	2.2 ug/L	.04	.04	0.043	0.043	102	101	70-130	1	20	
Cadmium	mg/L	ND	.04	.04	0.040	0.040	99	100	70-130	1	20	
Cobalt	mg/L	0.048J ug/L	.04	.04	0.040	0.039	99	98	70-130	1	20	
Molybdenum	mg/L	0.26J ug/L	.04	.04	0.043	0.043	107	107	70-130	0	20	
Selenium	mg/L	0.00013J	.04	.04	0.039	0.039	97	98	70-130	1	20	
Thallium	mg/L	0.000053J	.04	.04	0.038	0.038	94	94	70-130	0	20	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 471127

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60241031001

METHOD BLANK: 1929020

Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	04/03/17 14:38	

LABORATORY CONTROL SAMPLE: 1929021

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

SAMPLE DUPLICATE: 1929022

Parameter	Units	60240835001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	956	955	0	10	

SAMPLE DUPLICATE: 1929023

Parameter	Units	60240635009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	777	813	5	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 471258	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60241031001	

METHOD BLANK: 1929442 Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	04/04/17 22:02	

LABORATORY CONTROL SAMPLE: 1929443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1929444 1929445

Parameter	Units	60241095001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Fluoride	mg/L	ND	5	5.1	5	5.0	101	101	80-120	1	15	

MATRIX SPIKE SAMPLE: 1929446

Parameter	Units	60241100001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	50	51.5	101	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 471417

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60241031001

METHOD BLANK: 1930244

Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/05/17 16:35	
Sulfate	mg/L	<1.0	1.0	04/05/17 16:35	

LABORATORY CONTROL SAMPLE: 1930245

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930246 1930247

Parameter	Units	60241161004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	2730	1000	1000	3870	3870	114	115	80-120	0	15		
Sulfate	mg/L	3880	1000	1000	4950	4960	107	108	80-120	0	15		

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

Sample: MW-35-033117 **Lab ID: 60241031001** Collected: 03/31/17 17:05 Received: 04/01/17 10:10 Matrix: Water

PWS: Site ID: Sample Type:

Comments: • Per the client's request, the sample ID on this sample was changed from MW-32A-033117 was changed to MW-35-033117.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	32.6 ± 4.71 (0.461) C:NA T:96%	pCi/L	04/20/17 11:37	13982-63-3	
Radium-228	EPA 904.0	53.0 ± 9.64 (0.585) C:81% T:91%	pCi/L	04/20/17 17:50	15262-20-1	
Total Radium	Total Radium Calculation	85.6 ± 14.4 (1.05)	pCi/L	04/25/17 11:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 254815

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60241031001

METHOD BLANK: 1254966

Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.673 ± 0.419 (0.793) C:81% T:79%	pCi/L	04/20/17 17:49	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

QC Batch: 254814

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60241031001

METHOD BLANK: 1254964

Matrix: Water

Associated Lab Samples: 60241031001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.223 ± 0.269 (0.410) C:NA T:93%	pCi/L	04/20/17 11:08	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR GROUNDWATER

Pace Project No.: 60241031

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60241031001	MW-35-033117	EPA 200.7	471389	EPA 200.7	471460
60241031001	MW-35-033117	EPA 200.8	471205	EPA 200.8	471305
60241031001	MW-35-033117	EPA 245.1	471585	EPA 245.1	471655
60241031001	MW-35-033117	EPA 903.1	254814		
60241031001	MW-35-033117	EPA 904.0	254815		
60241031001	MW-35-033117	Total Radium Calculation	256312		
60241031001	MW-35-033117	SM 2540C	471127		
60241031001	MW-35-033117	SM 4500-H+B	471828		
60241031001	MW-35-033117	EPA 300.0	471258		
60241031001	MW-35-033117	EPA 300.0	471417		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60241031
Barcode
60241031

Client Name: Westar Energy

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

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

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

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

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

Cooler Temperature (°C): As-read 0.6 Corr. Factor CF -1.5 CF +0.9 Corrected 2.1

Date and initials of person examining contents: 4/11/17

Temperature should be above freezing to 6°C

Table with 2 columns: Question and Yes/No/N/A checkboxes. Rows include Chain of Custody, Short Hold Time analyses, Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match COC, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, Lead acetate strip, Potassium iodide test strip, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, Additional labels attached to 5035A / TX1005 vials.

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

Person Contacted: Date/Time:

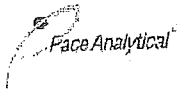
Comments/ Resolution:

Project Manager Review: [Signature] Date: 4/13/17

Sample Condition Upon Receipt Pittsburgh

30215187

KEH



Client Name: Paceys

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728560912110

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 4/5/17

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

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: _____

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-7
April 2017 Sampling Event
Laboratory Analytical Report

April 26, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60241329

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60241329001	MW-32-040417	Water	04/04/17 09:06	04/05/17 15:45
60241329002	MW-31R-040417	Water	04/04/17 10:49	04/05/17 15:45
60241329003	MW-33-040417	Water	04/04/17 12:46	04/05/17 15:45
60241329004	MW-34-040417	Water	04/04/17 15:19	04/05/17 15:45
60241329005	DUP-040417	Water	04/04/17 06:00	04/05/17 15:45

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60241329001	MW-32-040417	EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60241329002	MW-31R-040417	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	ZBM	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60241329003	MW-33-040417	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	JGP, ZBM	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60241329004	MW-34-040417	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	JGP, ZBM	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60241329005	DUP-040417	Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	ZBM	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-32-040417		Lab ID: 60241329001		Collected: 04/04/17 09:06		Received: 04/05/17 15:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.29	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:20	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/12/17 17:20	7440-41-7		
Boron, Total Recoverable	0.19	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:20	7440-42-8		
Calcium, Total Recoverable	55.7	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:20	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:20	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:20	7439-92-1		
Lithium	0.011	mg/L	0.010	1	04/06/17 11:20	04/12/17 17:20	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	04/06/17 11:20	04/07/17 12:46	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7440-48-4		
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:46	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 13:40	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	494	mg/L	5.0	1		04/06/17 15:37			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.8	Std. Units	0.10	1		04/12/17 10:47		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	94.2	mg/L	10.0	10		04/07/17 15:00	16887-00-6		
Fluoride	<0.20	mg/L	0.20	1		04/06/17 15:20	16984-48-8		
Sulfate	6.3	mg/L	1.0	1		04/06/17 15:20	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-31R-040417		Lab ID: 60241329002		Collected: 04/04/17 10:49		Received: 04/05/17 15:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.29	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:22	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/12/17 17:22	7440-41-7		
Boron, Total Recoverable	0.56	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:22	7440-42-8		
Calcium, Total Recoverable	196	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:22	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:22	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:22	7439-92-1		
Lithium	0.092	mg/L	0.010	1	04/06/17 11:20	04/12/17 17:22	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	04/06/17 11:20	04/07/17 12:54	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7440-48-4		
Molybdenum, Total Recoverable	0.0021	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 12:54	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 13:46	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	6100	mg/L	5.0	1		04/06/17 15:37			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.5	Std. Units	0.10	1		04/07/17 16:26		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	4300	mg/L	250	250		04/07/17 15:29	16887-00-6		
Fluoride	0.32	mg/L	0.20	1		04/06/17 17:01	16984-48-8		
Sulfate	114	mg/L	10.0	10		04/07/17 15:14	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-33-040417		Lab ID: 60241329003		Collected: 04/04/17 12:46		Received: 04/05/17 15:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.14	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:25	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/12/17 17:25	7440-41-7		
Boron, Total Recoverable	1.7	mg/L	0.10	1	04/06/17 11:20	04/17/17 17:05	7440-42-8		
Calcium, Total Recoverable	236	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:25	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/17/17 17:05	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:25	7439-92-1		
Lithium	0.20	mg/L	0.010	1	04/06/17 11:20	04/12/17 17:25	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0020	mg/L	0.0020	2	04/06/17 11:20	04/07/17 13:39	7440-36-0	D3	
Arsenic, Total Recoverable	0.0023	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:03	7440-38-2		
Cadmium, Total Recoverable	<0.0010	mg/L	0.0010	2	04/06/17 11:20	04/07/17 13:39	7440-43-9	D3	
Cobalt, Total Recoverable	0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:03	7440-48-4		
Molybdenum, Total Recoverable	0.0049	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:03	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:03	7782-49-2		
Thallium, Total Recoverable	<0.0020	mg/L	0.0020	2	04/06/17 11:20	04/07/17 13:39	7440-28-0	D3	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 13:48	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	12000	mg/L	5.0	1		04/06/17 15:37			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.4	Std. Units	0.10	1		04/12/17 10:50		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7150	mg/L	1000	1000		04/06/17 17:44	16887-00-6		
Fluoride	0.77	mg/L	0.20	1		04/06/17 17:15	16984-48-8		
Sulfate	260	mg/L	50.0	50		04/06/17 17:30	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-34-040417	Lab ID: 60241329004	Collected: 04/04/17 15:19		Received: 04/05/17 15:45		Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.14	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:27	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/12/17 17:27	7440-41-7	
Boron, Total Recoverable	2.1	mg/L	0.10	1	04/06/17 11:20	04/17/17 17:16	7440-42-8	
Calcium, Total Recoverable	213	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:27	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/17/17 17:16	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/17/17 17:16	7439-92-1	
Lithium	0.21	mg/L	0.010	1	04/06/17 11:20	04/12/17 17:27	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7440-36-0	
Arsenic, Total Recoverable	0.0029	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	04/06/17 11:20	04/07/17 13:12	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7440-48-4	
Molybdenum, Total Recoverable	0.0058	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:12	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 13:51	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	10800	mg/L	5.0	1		04/06/17 15:37		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.8	Std. Units	0.10	1		04/12/17 10:53		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	6000	mg/L	1000	1000		04/06/17 18:27	16887-00-6	
Fluoride	1.3	mg/L	0.20	1		04/06/17 17:59	16984-48-8	
Sulfate	402	mg/L	50.0	50		04/06/17 18:13	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: DUP-040417		Lab ID: 60241329005		Collected: 04/04/17 06:00		Received: 04/05/17 15:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.30	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:30	7440-39-3		
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/12/17 17:30	7440-41-7		
Boron, Total Recoverable	0.19	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:30	7440-42-8		
Calcium, Total Recoverable	55.1	mg/L	0.10	1	04/06/17 11:20	04/12/17 17:30	7440-70-2		
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:30	7440-47-3		
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	04/06/17 11:20	04/12/17 17:30	7439-92-1		
Lithium	0.012	mg/L	0.010	1	04/06/17 11:20	04/12/17 17:30	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7440-36-0		
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7440-38-2		
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	04/06/17 11:20	04/07/17 13:21	7440-43-9		
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7440-48-4		
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7439-98-7		
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7782-49-2		
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	04/06/17 11:20	04/07/17 13:21	7440-28-0		
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.00020	mg/L	0.00020	1	04/06/17 10:30	04/06/17 13:53	7439-97-6		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	490	mg/L	5.0	1		04/06/17 15:38			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.8	Std. Units	0.10	1		04/12/17 10:46		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	94.6	mg/L	10.0	10		04/07/17 15:44	16887-00-6		
Fluoride	<0.20	mg/L	0.20	1		04/06/17 18:42	16984-48-8		
Sulfate	6.2	mg/L	1.0	1		04/06/17 18:42	14808-79-8		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471586 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1930977 Matrix: Water
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	04/06/17 13:35	

LABORATORY CONTROL SAMPLE: 1930978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0050	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1930979 1930980

Parameter	Units	60241329001		60241329002		60241329003		60241329004		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Mercury	mg/L	<0.00020	.005	<0.00020	.005	0.0044	0.0044	0.0044	0.0044	87	87	70-130	0	20

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471627 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1931059 Matrix: Water
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.0050	0.0050	04/12/17 17:07	
Beryllium	mg/L	<0.0010	0.0010	04/12/17 17:07	
Boron	mg/L	<0.10	0.10	04/12/17 17:07	
Calcium	mg/L	<0.10	0.10	04/12/17 17:07	
Chromium	mg/L	<0.0050	0.0050	04/12/17 17:07	
Lead	mg/L	<0.0050	0.0050	04/12/17 17:07	
Lithium	mg/L	<0.010	0.010	04/12/17 17:07	

LABORATORY CONTROL SAMPLE: 1931060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.97	97	85-115	
Beryllium	mg/L	1	0.95	95	85-115	
Boron	mg/L	1	0.97	97	85-115	
Calcium	mg/L	10	9.2	92	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	1.0	100	85-115	
Lithium	mg/L	1	0.98	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931061 1931062

Parameter	Units	60241305001		1931061		1931062		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	41.1 ug/L		1	1	1.0	1.0	101	101	70-130	0	20	
Beryllium	mg/L	<0.16 ug/L		1	1	0.97	0.98	97	98	70-130	1	20	
Boron	mg/L	127 ug/L		1	1	1.2	1.2	103	104	70-130	1	20	
Calcium	mg/L	63400 ug/L		10	10	73.7	75.6	104	122	70-130	2	20	
Chromium	mg/L	1.7J ug/L		1	1	1.0	1.0	100	102	70-130	2	20	
Lead	mg/L	9.6 ug/L		1	1	1.0	1.0	99	100	70-130	1	20	
Lithium	mg/L	31.0 ug/L		1	1	1.1	1.0	102	102	70-130	0	20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471625 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1931051 Matrix: Water
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.0010	0.0010	04/07/17 12:02	
Arsenic	mg/L	<0.0010	0.0010	04/07/17 12:02	
Cadmium	mg/L	<0.00050	0.00050	04/07/17 12:02	
Cobalt	mg/L	<0.0010	0.0010	04/07/17 12:02	
Molybdenum	mg/L	<0.0010	0.0010	04/07/17 12:02	
Selenium	mg/L	<0.0010	0.0010	04/07/17 12:02	
Thallium	mg/L	<0.0010	0.0010	04/07/17 12:02	

LABORATORY CONTROL SAMPLE: 1931052

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.040	101	85-115	
Cadmium	mg/L	.04	0.040	100	85-115	
Cobalt	mg/L	.04	0.039	98	85-115	
Molybdenum	mg/L	.04	0.042	105	85-115	
Selenium	mg/L	.04	0.041	102	85-115	
Thallium	mg/L	.04	0.037	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931053 1931054

Parameter	Units	60241169003		1931053		1931054		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony	mg/L	ND	.04	.04	.04	0.040	0.041	100	101	70-130	1	20		
Arsenic	mg/L	ND	.04	.04	.04	0.041	0.042	101	102	70-130	1	20		
Cadmium	mg/L	ND	.04	.04	.04	0.039	0.039	97	98	70-130	1	20		
Cobalt	mg/L	ND	.04	.04	.04	0.039	0.039	96	97	70-130	0	20		
Molybdenum	mg/L	1.2 ug/L	.04	.04	.04	0.043	0.043	105	105	70-130	0	20		
Selenium	mg/L	ND	.04	.04	.04	0.039	0.039	97	96	70-130	1	20		
Thallium	mg/L	ND	.04	.04	.04	0.035	0.036	88	90	70-130	3	20		

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471744

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1931522

Matrix: Water

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	04/06/17 15:35	

LABORATORY CONTROL SAMPLE: 1931523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	969	97	80-120	

SAMPLE DUPLICATE: 1931524

Parameter	Units	60241391001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8970	9970	11	10	D6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471872 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60241329002

SAMPLE DUPLICATE: 1932231

Parameter	Units	60241107004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.4	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 472307 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60241329001, 60241329003, 60241329004, 60241329005

SAMPLE DUPLICATE: 1934025

Parameter	Units	60241329005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	1	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471599 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1931007 Matrix: Water
 Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/06/17 07:52	
Fluoride	mg/L	<0.20	0.20	04/06/17 07:52	
Sulfate	mg/L	<1.0	1.0	04/06/17 07:52	

LABORATORY CONTROL SAMPLE: 1931008

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	5.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931009 1931010

Parameter	Units	60241342001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Chloride	mg/L	1720	1000	1000	2800	2790	107	107	80-120	0	15		
Fluoride	mg/L	ND	500	500	494	491	99	98	80-120	1	15		
Sulfate	mg/L	ND	1000	1000	998	988	96	95	80-120	1	15		

MATRIX SPIKE SAMPLE: 1931129

Parameter	Units	60241274001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	71.7	100	170	99	80-120	
Fluoride	mg/L	ND	50	48.6	97	80-120	
Sulfate	mg/L	93.7	100	189	95	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 471826 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60241329001, 60241329002, 60241329005

METHOD BLANK: 1931915 Matrix: Water

Associated Lab Samples: 60241329001, 60241329002, 60241329005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	04/07/17 08:23	
Sulfate	mg/L	<1.0	1.0	04/07/17 08:23	

LABORATORY CONTROL SAMPLE: 1931916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931917 1931918

Parameter	Units	60241481001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Chloride	mg/L	1320	1000	2380	1000	2340	106	101	80-120	2	15	
Sulfate	mg/L	ND	1000	1100	1000	1110	98	99	80-120	1	15	

MATRIX SPIKE SAMPLE: 1931980

Parameter	Units	60241472004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	2730	1000	3860	113	80-120	
Sulfate	mg/L	3890	1000	4940	105	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-32-040417 **Lab ID: 60241329001** Collected: 04/04/17 09:06 Received: 04/05/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.68 ± 1.13 (0.746) C:NA T:93%	pCi/L	04/24/17 10:46	13982-63-3	
Radium-228	EPA 904.0	1.93 ± 0.584 (0.727) C:81% T:85%	pCi/L	04/22/17 13:47	15262-20-1	
Total Radium	Total Radium Calculation	5.61 ± 1.71 (1.47)	pCi/L	04/26/17 11:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-31R-040417 **Lab ID: 60241329002** Collected: 04/04/17 10:49 Received: 04/05/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	9.96 ± 2.02 (0.524) C:NA T:95%	pCi/L	04/24/17 10:46	13982-63-3	
Radium-228	EPA 904.0	14.7 ± 2.84 (0.829) C:81% T:79%	pCi/L	04/22/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	24.7 ± 4.86 (1.35)	pCi/L	04/26/17 11:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-33-040417 **Lab ID: 60241329003** Collected: 04/04/17 12:46 Received: 04/05/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	12.8 ± 2.40 (0.197) C:NA T:92%	pCi/L	04/24/17 10:59	13982-63-3	
Radium-228	EPA 904.0	11.6 ± 2.28 (0.793) C:79% T:87%	pCi/L	04/22/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	24.4 ± 4.68 (0.990)	pCi/L	04/26/17 11:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: MW-34-040417 **Lab ID: 60241329004** Collected: 04/04/17 15:19 Received: 04/05/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	11.7 ± 2.33 (1.32) C:NA T:91%	pCi/L	04/24/17 10:46	13982-63-3	
Radium-228	EPA 904.0	11.2 ± 2.22 (0.854) C:79% T:78%	pCi/L	04/22/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	22.9 ± 4.55 (2.17)	pCi/L	04/26/17 11:55	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Sample: DUP-040417 **Lab ID: 60241329005** Collected: 04/04/17 06:00 Received: 04/05/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.57 ± 1.02 (0.936) C:NA T:84%	pCi/L	04/24/17 10:59	13982-63-3	
Radium-228	EPA 904.0	1.86 ± 0.598 (0.798) C:81% T:80%	pCi/L	04/22/17 13:48	15262-20-1	
Total Radium	Total Radium Calculation	4.43 ± 1.62 (1.73)	pCi/L	04/26/17 11:55	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 255655 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1259161 Matrix: Water

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.228 ± 0.335 (0.720) C:77% T:79%	pCi/L	04/22/17 13:38	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60241329

QC Batch: 255650 Analysis Method: EPA 903.1

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

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

METHOD BLANK: 1259152 Matrix: Water

Associated Lab Samples: 60241329001, 60241329002, 60241329003, 60241329004, 60241329005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0769 ± 0.351 (0.208) C:NA T:85%	pCi/L	04/24/17 10:46	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60241329

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60241329001	MW-32-040417	EPA 200.7	471627	EPA 200.7	471737
60241329002	MW-31R-040417	EPA 200.7	471627	EPA 200.7	471737
60241329003	MW-33-040417	EPA 200.7	471627	EPA 200.7	471737
60241329004	MW-34-040417	EPA 200.7	471627	EPA 200.7	471737
60241329005	DUP-040417	EPA 200.7	471627	EPA 200.7	471737
60241329001	MW-32-040417	EPA 200.8	471625	EPA 200.8	471743
60241329002	MW-31R-040417	EPA 200.8	471625	EPA 200.8	471743
60241329003	MW-33-040417	EPA 200.8	471625	EPA 200.8	471743
60241329004	MW-34-040417	EPA 200.8	471625	EPA 200.8	471743
60241329005	DUP-040417	EPA 200.8	471625	EPA 200.8	471743
60241329001	MW-32-040417	EPA 245.1	471586	EPA 245.1	471653
60241329002	MW-31R-040417	EPA 245.1	471586	EPA 245.1	471653
60241329003	MW-33-040417	EPA 245.1	471586	EPA 245.1	471653
60241329004	MW-34-040417	EPA 245.1	471586	EPA 245.1	471653
60241329005	DUP-040417	EPA 245.1	471586	EPA 245.1	471653
60241329001	MW-32-040417	EPA 903.1	255650		
60241329002	MW-31R-040417	EPA 903.1	255650		
60241329003	MW-33-040417	EPA 903.1	255650		
60241329004	MW-34-040417	EPA 903.1	255650		
60241329005	DUP-040417	EPA 903.1	255650		
60241329001	MW-32-040417	EPA 904.0	255655		
60241329002	MW-31R-040417	EPA 904.0	255655		
60241329003	MW-33-040417	EPA 904.0	255655		
60241329004	MW-34-040417	EPA 904.0	255655		
60241329005	DUP-040417	EPA 904.0	255655		
60241329001	MW-32-040417	Total Radium Calculation	256483		
60241329002	MW-31R-040417	Total Radium Calculation	256483		
60241329003	MW-33-040417	Total Radium Calculation	256483		
60241329004	MW-34-040417	Total Radium Calculation	256483		
60241329005	DUP-040417	Total Radium Calculation	256483		
60241329001	MW-32-040417	SM 2540C	471744		
60241329002	MW-31R-040417	SM 2540C	471744		
60241329003	MW-33-040417	SM 2540C	471744		
60241329004	MW-34-040417	SM 2540C	471744		
60241329005	DUP-040417	SM 2540C	471744		
60241329001	MW-32-040417	SM 4500-H+B	472307		
60241329002	MW-31R-040417	SM 4500-H+B	471872		
60241329003	MW-33-040417	SM 4500-H+B	472307		
60241329004	MW-34-040417	SM 4500-H+B	472307		
60241329005	DUP-040417	SM 4500-H+B	472307		
60241329001	MW-32-040417	EPA 300.0	471599		
60241329001	MW-32-040417	EPA 300.0	471826		
60241329002	MW-31R-040417	EPA 300.0	471599		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60241329

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60241329002	MW-31R-040417	EPA 300.0	471826		
60241329003	MW-33-040417	EPA 300.0	471599		
60241329004	MW-34-040417	EPA 300.0	471599		
60241329005	DUP-040417	EPA 300.0	471599		
60241329005	DUP-040417	EPA 300.0	471826		

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Sample Condition Upon Receipt

WO#: 60241329
Barcode
60241329

Client Name: Westar

Handwritten initials

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

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

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

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

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

Cooler Temperature (°C): As-read 2.6 Corr. Factor CF +1.3 CF +0.9 Corrected 4.1

Date and initials of person examining contents: 4/5/17

Temperature should be above freezing to 6°C

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

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: [Signature] Date: 4/5/17

Chain of Custody



Workorder: 60241329 Workorder Name: LEC CCR Groundwater Owner Received Date: 4/5/2017 Results Requested By: 4/26/2017

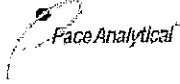
Report To		Subcontract To					Requested Analysis																														
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="border: 1px solid black; padding: 5px; background-color: #e0f0ff;"> <p>WO#: 30215487</p> <p>30215487</p> </div>																														
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	HNO3	Preserved Containers				Radium-226 & Total Sum Radium	Radium-228											LAB USE ONLY														
1	MW-32-040417	PS	4/4/2017 09:06	60241329001	Water	2					X	X																									001
2	MW-31R-040417	PS	4/4/2017 10:49	60241329002	Water	2					X	X																									002
3	MW-33-040417	PS	4/4/2017 12:46	60241329003	Water	2					X	X																									003
4	MW-34-040417	PS	4/4/2017 15:19	60241329004	Water	2					X	X																									004
5	DUP-040417	PS	4/4/2017 06:00	60241329005	Water	2					X	X																									005
Transfers		Released By		Date/Time		Received By		Date/Time		Comments																											
1		R. Wilson		4/6/17 1300		D. Sheehan (Pace)		4-7-17/0955																													
2																																					
3																																					
Cooler Temperature on Receipt			N/A			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

30215487 -

ANK



Client Name: Pace, KS Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 7285 6591 3394

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: ANK 4-7-17

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:	X			5.
-Includes date/time/ID Matrix: <u>WT</u>				
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:	X			10.
-Pace Containers Used:	X			
Containers Intact:	X			11.
Orthophosphate field filtered			X	12.
Organic Samples checked for dechlorination:			X	13.
Filtered volume received for Dissolved tests			X	14.
All containers have been checked for preservation.	X			15.
All containers needing preservation are found to be in compliance with EPA recommendation.	X			<u>PHLZ</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ANK</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			X	16.
Trip Blank Present:		X		17.
Trip Blank Custody Seals Present		X		
Rad Aqueous Samples Screened > 0.5 mrem/hr	X			Initial when completed: <u>ANK</u> Date: <u>4-7-17</u>

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-8
May 2017 Sampling Event
Laboratory Analytical Report

August 22, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60244908

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on May 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.

Revised Report_rev.1 During a review of the 300.0 chloride result for sample 60244908-003 per the client's request, we found that the chloride result was posted from the wrong dilution. The result has been revised.

Revised Report_rev.2 Per the client's request, the samples 60244908-001, -003, -004, -005, -006, -007 were re-evaluated down to the MDL.

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

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY

Adam Kneeling, Haley & Aldrich, Inc.



REPORT OF LABORATORY ANALYSIS

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August 22, 2017
Page 2

cc: JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

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

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: LEC CCR Groundwater

Pace Project No.: 60244908

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60244908001	MW-35-052217	Water	05/22/17 11:35	05/23/17 15:50
60244908002	MW-32-052217	Water	05/22/17 12:24	05/23/17 15:50
60244908003	MW-36-052217	Water	05/22/17 13:04	05/23/17 15:50
60244908004	MW-31R-052217	Water	05/23/17 07:38	05/23/17 15:50
60244908005	MW-33-052217	Water	05/23/17 08:38	05/23/17 15:50
60244908006	MW-34-052217	Water	05/23/17 09:50	05/23/17 15:50
60244908007	DUP-052217	Water	05/22/17 08:00	05/23/17 15:50

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60244908001	MW-35-052217	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60244908002	MW-32-052217	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60244908003	MW-36-052217	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
60244908004	MW-31R-052217	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60244908005	MW-33-052217	Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60244908006	MW-34-052217	EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60244908007	DUP-052217	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-35-052217		Lab ID: 60244908001	Collected: 05/22/17 11:35	Received: 05/23/17 15:50	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.14	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:51	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 13:51	7440-41-7	
Boron, Total Recoverable	1.8	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:51	7440-42-8	
Calcium, Total Recoverable	545	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:51	7440-70-2	
Chromium, Total Recoverable	0.00080J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:51	7440-47-3	
Lead, Total Recoverable	0.0039J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:51	7439-92-1	
Lithium	0.43	mg/L	0.010	1	05/25/17 15:06	06/12/17 13:51	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00053J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7440-36-0	D3
Arsenic, Total Recoverable	0.00061J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7440-38-2	D3
Cadmium, Total Recoverable	<0.00018	mg/L	0.0050	10	05/25/17 11:30	05/26/17 12:29	7440-43-9	D3
Cobalt, Total Recoverable	0.0051J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7440-48-4	D3
Molybdenum, Total Recoverable	0.0052J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7439-98-7	D3
Selenium, Total Recoverable	<0.00086	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7782-49-2	D3
Thallium, Total Recoverable	<0.00036	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:29	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:09	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	24900	mg/L	5.0	1		05/25/17 08:44		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		05/30/17 00:00		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14200	mg/L	1000	1000		05/25/17 04:34	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		05/25/17 04:04	16984-48-8	
Sulfate	650	mg/L	50.0	50		05/25/17 04:19	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-32-052217	Lab ID: 60244908002	Collected: 05/22/17 12:24	Received: 05/23/17 15:50	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.30	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:53	7440-39-3	
Beryllium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 15:06	06/12/17 13:53	7440-41-7	
Boron, Total Recoverable	0.18	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:53	7440-42-8	
Calcium, Total Recoverable	60.8	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:53	7440-70-2	
Chromium, Total Recoverable	<0.0050	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:53	7440-47-3	
Lead, Total Recoverable	<0.0050	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:53	7439-92-1	
Lithium	0.012	mg/L	0.010	1	05/25/17 15:06	06/12/17 13:53	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7440-36-0	
Arsenic, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7440-38-2	
Cadmium, Total Recoverable	<0.00050	mg/L	0.00050	1	05/25/17 11:30	05/26/17 11:53	7440-43-9	
Cobalt, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7440-48-4	
Molybdenum, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7439-98-7	
Selenium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7782-49-2	
Thallium, Total Recoverable	<0.0010	mg/L	0.0010	1	05/25/17 11:30	05/26/17 11:53	7440-28-0	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.00020	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:12	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	525	mg/L	5.0	1		05/25/17 08:44		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		05/30/17 00:00		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	102	mg/L	10.0	10		05/25/17 05:04	16887-00-6	
Fluoride	0.24	mg/L	0.20	1		05/25/17 04:49	16984-48-8	
Sulfate	6.8	mg/L	1.0	1		05/25/17 04:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-36-052217		Lab ID: 60244908003	Collected: 05/22/17 13:04	Received: 05/23/17 15:50	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.25	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:56	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 13:56	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:56	7440-42-8	
Calcium, Total Recoverable	577	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:56	7440-70-2	
Chromium, Total Recoverable	0.0021J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:56	7440-47-3	
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:56	7439-92-1	
Lithium	0.42	mg/L	0.010	1	05/25/17 15:06	06/12/17 13:56	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.0011J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7440-36-0	D3
Arsenic, Total Recoverable	0.0018J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7440-38-2	D3
Cadmium, Total Recoverable	<0.00018	mg/L	0.0050	10	05/25/17 11:30	05/26/17 12:35	7440-43-9	D3
Cobalt, Total Recoverable	0.012	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7440-48-4	
Molybdenum, Total Recoverable	0.0092J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7439-98-7	D3
Selenium, Total Recoverable	<0.00086	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7782-49-2	D3
Thallium, Total Recoverable	<0.00036	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:35	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:18	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	37800	mg/L	5.0	1		05/25/17 08:44		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		05/30/17 00:00		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	15000	mg/L	1000	1000		05/25/17 18:58	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		05/25/17 06:19	16984-48-8	
Sulfate	482	mg/L	50.0	50		05/25/17 05:19	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-31R-052217		Lab ID: 60244908004		Collected: 05/23/17 07:38		Received: 05/23/17 15:50		Matrix: Water	
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium, Total Recoverable	0.27	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:58	7440-39-3		
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 13:58	7440-41-7		
Boron, Total Recoverable	0.59	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:58	7440-42-8		
Calcium, Total Recoverable	224	mg/L	0.10	1	05/25/17 15:06	06/12/17 13:58	7440-70-2		
Chromium, Total Recoverable	<0.00072	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:58	7440-47-3		
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	05/25/17 15:06	06/12/17 13:58	7439-92-1		
Lithium	0.11	mg/L	0.010	1	05/25/17 15:06	06/12/17 13:58	7439-93-2		
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony, Total Recoverable	0.00021J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7440-36-0	D3	
Arsenic, Total Recoverable	0.00033J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7440-38-2	D3	
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	05/25/17 11:30	05/26/17 12:39	7440-43-9	D3	
Cobalt, Total Recoverable	0.00010J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7440-48-4	D3	
Molybdenum, Total Recoverable	0.0026J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7439-98-7	D3	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7782-49-2	D3	
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:39	7440-28-0	D3	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:20	7439-97-6		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	7370	mg/L	5.0	1		05/25/17 08:45			
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
pH at 25 Degrees C	7.4	Std. Units	0.10	1		05/30/17 00:00		H6	
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Chloride	3910	mg/L	250	250		05/25/17 07:03	16887-00-6		
Fluoride	0.64	mg/L	0.20	1		05/25/17 06:33	16984-48-8		
Sulfate	126	mg/L	10.0	10		05/25/17 06:48	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-33-052217		Lab ID: 60244908005	Collected: 05/23/17 08:38	Received: 05/23/17 15:50	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.13	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:01	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 14:01	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:01	7440-42-8	
Calcium, Total Recoverable	265	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:01	7440-70-2	
Chromium, Total Recoverable	0.0015J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:01	7440-47-3	
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:01	7439-92-1	
Lithium	0.21	mg/L	0.010	1	05/25/17 15:06	06/12/17 14:01	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.00026	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7440-36-0	D3
Arsenic, Total Recoverable	0.0023J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7440-38-2	D3
Cadmium, Total Recoverable	<0.00018	mg/L	0.0050	10	05/25/17 11:30	05/26/17 12:55	7440-43-9	D3
Cobalt, Total Recoverable	0.00094J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7440-48-4	D3
Molybdenum, Total Recoverable	0.0059J	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7439-98-7	D3
Selenium, Total Recoverable	<0.00086	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7782-49-2	D3
Thallium, Total Recoverable	<0.00036	mg/L	0.010	10	05/25/17 11:30	05/26/17 12:55	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:23	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	12900	mg/L	5.0	1		05/25/17 08:46		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.6	Std. Units	0.10	1		05/30/17 00:00		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	7010	mg/L	1000	1000		05/25/17 21:01	16887-00-6	
Fluoride	1.3	mg/L	0.20	1		05/25/17 20:30	16984-48-8	
Sulfate	287	mg/L	25.0	25		05/25/17 20:46	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-34-052217		Lab ID: 60244908006		Collected: 05/23/17 09:50		Received: 05/23/17 15:50		Matrix: Water	
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium, Total Recoverable	0.13	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:04	7440-39-3		
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 14:04	7440-41-7		
Boron, Total Recoverable	2.1	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:04	7440-42-8		
Calcium, Total Recoverable	236	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:04	7440-70-2		
Chromium, Total Recoverable	0.0013J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:04	7440-47-3		
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:04	7439-92-1		
Lithium	0.22	mg/L	0.010	1	05/25/17 15:06	06/12/17 14:04	7439-93-2		
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony, Total Recoverable	<0.00013	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7440-36-0	D3	
Arsenic, Total Recoverable	0.0029J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7440-38-2	D3	
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	05/25/17 11:30	05/26/17 12:58	7440-43-9	D3	
Cobalt, Total Recoverable	0.00020J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7440-48-4	D3	
Molybdenum, Total Recoverable	0.0062	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7439-98-7		
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7782-49-2	D3	
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	05/25/17 11:30	05/26/17 12:58	7440-28-0	D3	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:29	7439-97-6		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	11400	mg/L	5.0	1		05/25/17 08:46			
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
pH at 25 Degrees C	7.7	Std. Units	0.10	1		05/30/17 00:00		H6	
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Chloride	6250	mg/L	500	500		05/25/17 21:47	16887-00-6		
Fluoride	1.7	mg/L	0.20	1		05/25/17 21:16	16984-48-8		
Sulfate	418	mg/L	50.0	50		05/25/17 21:32	14808-79-8		

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: DUP-052217		Lab ID: 60244908007	Collected: 05/22/17 08:00	Received: 05/23/17 15:50	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.24	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:06	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	05/25/17 15:06	06/12/17 14:06	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:06	7440-42-8	
Calcium, Total Recoverable	582	mg/L	0.10	1	05/25/17 15:06	06/12/17 14:06	7440-70-2	
Chromium, Total Recoverable	0.00075J	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:06	7440-47-3	
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	05/25/17 15:06	06/12/17 14:06	7439-92-1	
Lithium	0.43	mg/L	0.010	1	05/25/17 15:06	06/12/17 14:06	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.0011J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7440-36-0	D3
Arsenic, Total Recoverable	0.0018J	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7440-38-2	D3
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	05/25/17 11:30	05/26/17 13:04	7440-43-9	D3
Cobalt, Total Recoverable	0.012	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7440-48-4	
Molybdenum, Total Recoverable	0.0095	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	05/25/17 11:30	05/26/17 13:04	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	06/02/17 15:45	06/05/17 10:31	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	28000	mg/L	5.0	1		05/25/17 08:45		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		06/01/17 13:00		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14000	mg/L	2000	2000		05/30/17 16:53	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		05/25/17 22:03	16984-48-8	
Sulfate	513	mg/L	50.0	50		05/30/17 16:38	14808-79-8	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch: 479454 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

METHOD BLANK: 1963749 Matrix: Water
 Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.000024	0.00020	06/05/17 10:03	

LABORATORY CONTROL SAMPLE: 1963750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0046	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1963751 1963752

Parameter	Units	60244908002		60244908003		60244908004		60244908005		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Mercury	mg/L	<0.00020	.005	.005	0.0045	0.0043	90	86	70-130	4	20		

MATRIX SPIKE SAMPLE: 1963753

Parameter	Units	60245415001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0048	93	70-130	

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

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch:	478403	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

METHOD BLANK: 1959584 Matrix: Water
Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	05/30/17 14:46	
Beryllium	mg/L	<0.00016	0.0010	05/30/17 14:46	
Boron	mg/L	<0.0035	0.10	05/30/17 14:46	
Calcium	mg/L	<0.036	0.10	05/30/17 14:46	
Chromium	mg/L	<0.00072	0.0050	05/30/17 14:46	
Lead	mg/L	<0.0024	0.0050	05/30/17 14:46	
Lithium	mg/L	<0.0029	0.010	05/30/17 14:46	

LABORATORY CONTROL SAMPLE: 1959586

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.1	106	85-115	
Beryllium	mg/L	1	1.1	106	85-115	
Boron	mg/L	1	1.0	103	85-115	
Calcium	mg/L	10	10.4	104	85-115	
Chromium	mg/L	1	1.0	103	85-115	
Lead	mg/L	1	1.1	106	85-115	
Lithium	mg/L	1	1.0	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959587 1959588

Parameter	Units	60244275002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Barium	mg/L	115 ug/L	1	1	1.2	1.2	104	104	70-130	0	20		
Beryllium	mg/L	<1.0 ug/L	1	1	1.1	1.0	105	104	70-130	1	20		
Boron	mg/L	263 ug/L	1	1	1.3	1.3	104	104	70-130	0	20		
Calcium	mg/L	73700 ug/L	10	10	81.9	81.7	82	80	70-130	0	20		
Chromium	mg/L	<5.0 ug/L	1	1	1.0	1.0	102	102	70-130	0	20		
Lead	mg/L	<5.0 ug/L	1	1	1.0	1.0	101	101	70-130	0	20		
Lithium	mg/L	34.8 ug/L	1	1	1.1	1.0	102	102	70-130	0	20		

MATRIX SPIKE SAMPLE: 1959589

Parameter	Units	60245012001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	0.11	1	1.1	97	70-130	
Beryllium	mg/L	<0.0010	1	1.0	100	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

MATRIX SPIKE SAMPLE:		1959589					
Parameter	Units	60245012001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	<0.10	1	1.1	100	70-130	
Calcium	mg/L	173	10	183	104	70-130	
Chromium	mg/L	<0.0050	1	0.99	99	70-130	
Lead	mg/L	<0.0050	1	0.95	95	70-130	
Lithium	mg/L	<0.010	1	1.0	100	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60244908

QC Batch: 478320 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

METHOD BLANK: 1959224 Matrix: Water
Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	05/26/17 11:24	
Arsenic	mg/L	<0.000052	0.0010	05/26/17 11:24	
Cadmium	mg/L	<0.000018	0.00050	05/26/17 11:24	
Cobalt	mg/L	<0.000014	0.0010	05/26/17 11:24	
Molybdenum	mg/L	<0.000058	0.0010	05/26/17 11:24	
Selenium	mg/L	<0.000086	0.0010	05/26/17 11:24	
Thallium	mg/L	0.000098J	0.0010	05/26/17 11:24	

LABORATORY CONTROL SAMPLE: 1959225

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.041	102	85-115	
Cadmium	mg/L	.04	0.040	101	85-115	
Cobalt	mg/L	.04	0.041	102	85-115	
Molybdenum	mg/L	.04	0.042	105	85-115	
Selenium	mg/L	.04	0.040	100	85-115	
Thallium	mg/L	.04	0.038	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959226 1959227

Parameter	Units	60243881003		1959226		1959227		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Antimony	mg/L	0.89J ug/L	.04	.04	0.041	0.041	101	100	70-130	1	20			
Arsenic	mg/L	0.43J ug/L	.04	.04	0.041	0.041	101	100	70-130	1	20			
Cadmium	mg/L	4.2 ug/L	.04	.04	0.043	0.043	97	97	70-130	0	20			
Cobalt	mg/L	6.0 ug/L	.04	.04	0.046	0.046	101	101	70-130	0	20			
Molybdenum	mg/L	0.77J ug/L	.04	.04	0.044	0.043	108	106	70-130	2	20			
Selenium	mg/L	0.27J ug/L	.04	.04	0.039	0.038	97	95	70-130	2	20			
Thallium	mg/L	1.2 ug/L	.04	.04	0.038	0.037	91	90	70-130	1	20			

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60244908

QC Batch:	478311	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

METHOD BLANK: 1959198 Matrix: Water
Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	05/25/17 08:40	

LABORATORY CONTROL SAMPLE: 1959199

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 1959200

Parameter	Units	60244898001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	992	967	3	10	

SAMPLE DUPLICATE: 1959201

Parameter	Units	60244908007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	28000	26800	4	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch: 478847 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006

SAMPLE DUPLICATE: 1961575

Parameter	Units	60244837001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	9.5	9.5	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch: 479125 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60244908007

SAMPLE DUPLICATE: 1962378

Parameter	Units	60245259004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.4	6.4	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch: 478213 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004

METHOD BLANK: 1958864 Matrix: Water
 Associated Lab Samples: 60244908001, 60244908002, 60244908003, 60244908004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	05/25/17 01:35	
Fluoride	mg/L	<0.10	0.20	05/25/17 01:35	
Sulfate	mg/L	<0.50	1.0	05/25/17 01:35	

LABORATORY CONTROL SAMPLE: 1958865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE SAMPLE: 1958867

Parameter	Units	60244984002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	54600	25000	80700	104	80-120	
Fluoride	mg/L	ND	12500	11900	96	80-120	
Sulfate	mg/L	17000	25000	42100	100	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch: 478369 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60244908003, 60244908005, 60244908006, 60244908007

METHOD BLANK: 1959405 Matrix: Water
 Associated Lab Samples: 60244908003, 60244908005, 60244908006, 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	05/25/17 16:24	
Fluoride	mg/L	<0.10	0.20	05/25/17 16:24	
Sulfate	mg/L	<0.50	1.0	05/25/17 16:24	

LABORATORY CONTROL SAMPLE: 1959406

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	
Fluoride	mg/L	2.5	2.7	106	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959407 1959408

Parameter	Units	6024500004		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result						
Chloride	mg/L	3200	1000	1000	4380	4370	118	118	80-120	0	15		
Fluoride	mg/L	ND	500	500	522	519	104	104	80-120	1	15		

MATRIX SPIKE SAMPLE: 1959689

Parameter	Units	60245054008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	6.7	5	12.0	107	80-120	
Fluoride	mg/L	0.27	2.5	2.9	105	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60244908

QC Batch: 478801	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60244908007	

METHOD BLANK: 1961443 Matrix: Water
Associated Lab Samples: 60244908007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	05/30/17 08:55	
Sulfate	mg/L	<0.50	1.0	05/30/17 08:55	

LABORATORY CONTROL SAMPLE: 1961444

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-35-052217 **Lab ID: 60244908001** Collected: 05/22/17 11:35 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	8.52 ± 1.76 (0.742) C:NA T:101%	pCi/L	06/06/17 21:33	13982-63-3	
Radium-228	EPA 904.0	54.3 ± 9.91 (0.826) C:74% T:83%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	62.8 ± 11.7 (1.57)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-32-052217 **Lab ID: 60244908002** Collected: 05/22/17 12:24 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.75 ± 0.939 (0.750) C:NA T:94%	pCi/L	06/06/17 21:33	13982-63-3	
Radium-228	EPA 904.0	1.58 ± 0.543 (0.753) C:74% T:81%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	4.33 ± 1.48 (1.50)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-36-052217 **Lab ID: 60244908003** Collected: 05/22/17 13:04 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	15.4 ± 2.66 (0.763) C:NA T:94%	pCi/L	06/06/17 21:33	13982-63-3	
Radium-228	EPA 904.0	52.7 ± 9.63 (0.829) C:75% T:74%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	68.1 ± 12.3 (1.59)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-31R-052217 **Lab ID: 60244908004** Collected: 05/23/17 07:38 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	4.95 ± 1.29 (0.192) C:NA T:89%	pCi/L	06/06/17 21:33	13982-63-3	
Radium-228	EPA 904.0	14.5 ± 2.78 (0.752) C:74% T:87%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	19.5 ± 4.07 (0.944)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-33-052217 **Lab ID: 60244908005** Collected: 05/23/17 08:38 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	12.3 ± 2.36 (0.780) C:NA T:84%	pCi/L	06/06/17 21:33	13982-63-3	
Radium-228	EPA 904.0	11.0 ± 2.20 (0.768) C:76% T:73%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	23.3 ± 4.56 (1.55)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: MW-34-052217 **Lab ID: 60244908006** Collected: 05/23/17 09:50 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	8.40 ± 1.76 (0.810) C:NA T:98%	pCi/L	06/06/17 21:48	13982-63-3	
Radium-228	EPA 904.0	11.9 ± 2.35 (0.794) C:74% T:81%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	20.3 ± 4.11 (1.60)	pCi/L	06/13/17 11:15	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Sample: DUP-052217 **Lab ID: 60244908007** Collected: 05/22/17 08:00 Received: 05/23/17 15:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	28.1 ± 4.17 (0.575) C:NA T:98%	pCi/L	06/06/17 21:48	13982-63-3	
Radium-228	EPA 904.0	47.3 ± 8.66 (0.776) C:73% T:79%	pCi/L	06/08/17 15:23	15262-20-1	
Total Radium	Total Radium Calculation	75.4 ± 12.8 (1.35)	pCi/L	06/13/17 11:15	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch:	259875	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

METHOD BLANK:	1280122	Matrix:	Water
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0635 ± 0.482 (0.953) C:NA T:95%	pCi/L	06/06/17 21:33	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60244908

QC Batch:	260159	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

METHOD BLANK:	1281556	Matrix:	Water
Associated Lab Samples:	60244908001, 60244908002, 60244908003, 60244908004, 60244908005, 60244908006, 60244908007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.406 ± 0.353 (0.708) C:77% T:77%	pCi/L	06/08/17 11:34	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60244908

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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: LEC CCR Groundwater

Pace Project No.: 60244908

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60244908001	MW-35-052217	EPA 200.7	478403	EPA 200.7	478490
60244908002	MW-32-052217	EPA 200.7	478403	EPA 200.7	478490
60244908003	MW-36-052217	EPA 200.7	478403	EPA 200.7	478490
60244908004	MW-31R-052217	EPA 200.7	478403	EPA 200.7	478490
60244908005	MW-33-052217	EPA 200.7	478403	EPA 200.7	478490
60244908006	MW-34-052217	EPA 200.7	478403	EPA 200.7	478490
60244908007	DUP-052217	EPA 200.7	478403	EPA 200.7	478490
60244908001	MW-35-052217	EPA 200.8	478320	EPA 200.8	478451
60244908002	MW-32-052217	EPA 200.8	478320	EPA 200.8	478451
60244908003	MW-36-052217	EPA 200.8	478320	EPA 200.8	478451
60244908004	MW-31R-052217	EPA 200.8	478320	EPA 200.8	478451
60244908005	MW-33-052217	EPA 200.8	478320	EPA 200.8	478451
60244908006	MW-34-052217	EPA 200.8	478320	EPA 200.8	478451
60244908007	DUP-052217	EPA 200.8	478320	EPA 200.8	478451
60244908001	MW-35-052217	EPA 245.1	479454	EPA 245.1	479500
60244908002	MW-32-052217	EPA 245.1	479454	EPA 245.1	479500
60244908003	MW-36-052217	EPA 245.1	479454	EPA 245.1	479500
60244908004	MW-31R-052217	EPA 245.1	479454	EPA 245.1	479500
60244908005	MW-33-052217	EPA 245.1	479454	EPA 245.1	479500
60244908006	MW-34-052217	EPA 245.1	479454	EPA 245.1	479500
60244908007	DUP-052217	EPA 245.1	479454	EPA 245.1	479500
60244908001	MW-35-052217	EPA 903.1	259875		
60244908002	MW-32-052217	EPA 903.1	259875		
60244908003	MW-36-052217	EPA 903.1	259875		
60244908004	MW-31R-052217	EPA 903.1	259875		
60244908005	MW-33-052217	EPA 903.1	259875		
60244908006	MW-34-052217	EPA 903.1	259875		
60244908007	DUP-052217	EPA 903.1	259875		
60244908001	MW-35-052217	EPA 904.0	260159		
60244908002	MW-32-052217	EPA 904.0	260159		
60244908003	MW-36-052217	EPA 904.0	260159		
60244908004	MW-31R-052217	EPA 904.0	260159		
60244908005	MW-33-052217	EPA 904.0	260159		
60244908006	MW-34-052217	EPA 904.0	260159		
60244908007	DUP-052217	EPA 904.0	260159		
60244908001	MW-35-052217	Total Radium Calculation	261676		
60244908002	MW-32-052217	Total Radium Calculation	261676		
60244908003	MW-36-052217	Total Radium Calculation	261676		
60244908004	MW-31R-052217	Total Radium Calculation	261676		
60244908005	MW-33-052217	Total Radium Calculation	261676		
60244908006	MW-34-052217	Total Radium Calculation	261676		
60244908007	DUP-052217	Total Radium Calculation	261676		
60244908001	MW-35-052217	SM 2540C	478311		
60244908002	MW-32-052217	SM 2540C	478311		
60244908003	MW-36-052217	SM 2540C	478311		
60244908004	MW-31R-052217	SM 2540C	478311		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60244908

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60244908005	MW-33-052217	SM 2540C	478311		
60244908006	MW-34-052217	SM 2540C	478311		
60244908007	DUP-052217	SM 2540C	478311		
60244908001	MW-35-052217	SM 4500-H+B	478847		
60244908002	MW-32-052217	SM 4500-H+B	478847		
60244908003	MW-36-052217	SM 4500-H+B	478847		
60244908004	MW-31R-052217	SM 4500-H+B	478847		
60244908005	MW-33-052217	SM 4500-H+B	478847		
60244908006	MW-34-052217	SM 4500-H+B	478847		
60244908007	DUP-052217	SM 4500-H+B	479125		
60244908001	MW-35-052217	EPA 300.0	478213		
60244908002	MW-32-052217	EPA 300.0	478213		
60244908003	MW-36-052217	EPA 300.0	478213		
60244908003	MW-36-052217	EPA 300.0	478369		
60244908004	MW-31R-052217	EPA 300.0	478213		
60244908005	MW-33-052217	EPA 300.0	478369		
60244908006	MW-34-052217	EPA 300.0	478369		
60244908007	DUP-052217	EPA 300.0	478369		
60244908007	DUP-052217	EPA 300.0	478801		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60244908



Client Name: Westar Energy

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

Tracking #: _____ Pace Shipping Label Used? Yes [] No []

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

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

Thermometer Used: T-266 CF +2.9 T-239 CF +0.2 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 3.8 2.6 Corr. Factor CF +2.9 CF +0.2 Corrected 4.0 2.8

Date and initials of person examining contents: 5/23/17

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Amw

Date: 5/24/17

Chain of Custody

WO#: 30219840



30219840



Workorder: 60244908

Workorder Name: LEC CCR Groundwater

Owner Received Date: 5/23/2017 Results Requested By: 6/15/2017

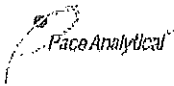
Report To		Subcontract To				Requested Analysis																							
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600																											
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Radium-228	Radium-226 & Total Radium	Requested Analysis									LAB USE ONLY							
						HNO3																							
1	MW-35-052217	PS	5/22/2017 11:35	60244908001	Water	2						X	X																001
2	MW-32-052217	PS	5/22/2017 12:24	60244908002	Water	2						X	X																002
3	MW-36-052217	PS	5/22/2017 13:04	60244908003	Water	2						X	X																003
4	MW-31R-052217	PS	5/23/2017 07:38	60244908004	Water	2						X	X																004
5	MW-33-052217	PS	5/23/2017 08:38	60244908005	Water	2						X	X																005
6	MW-34-052217	PS	5/23/2017 09:50	60244908006	Water	2						X	X																006
7	DUP-052217	PS	5/22/2017 08:00	60244908007	Water	2						X	X																007

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	5/24/17 1700	<i>[Signature]</i>	5/25/17 1000	
2					
3					

Cooler Temperature on Receipt	MA °C	Custody Seal	<input checked="" type="radio"/> Y or <input type="radio"/> N	Received on Ice	Y or <input checked="" type="radio"/> N	Samples Intact	<input checked="" type="radio"/> Y or <input type="radio"/> N
-------------------------------	-------	--------------	---	-----------------	---	----------------	---

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

Sample Condition Upon Receipt Pittsburgh



Client Name: Pace Kansas

Project # 30219840

KEH

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728565927357

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

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp NA °C Correction Factor: N/A °C Final Temp: NA °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KEH 5/25/17

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: <u>W</u>	/			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.	/			15. <u>PHC2</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>KEH</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):			/	16.
Trip Blank Present:			/	17.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>KEH</u> Date: <u>5/25/17</u>

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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

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

ATTACHMENT 1-9
June 2017 Sampling Event
Laboratory Analytical Report

August 22, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR GROUNDWATER
Pace Project No.: 60246222

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on June 09, 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.

Revised Report_rev.1 Per the client's request, the samples 60246222-001 and -002 were re-evaluated down to the MDL.

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

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

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

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: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60246222001	MW-35-060917	Water	06/09/17 11:40	06/09/17 15:45
60246222002	MW-36-060917	Water	06/09/17 12:43	06/09/17 15:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60246222001	MW-35-060917	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		60246222002	MW-36-060917	EPA 200.7	SMW
EPA 200.8	JGP			7	PASI-K
EPA 245.1	JRS			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	LDF			1	PASI-K
SM 4500-H+B	JSS			1	PASI-K
EPA 300.0	RAD			3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Sample: MW-35-060917	Lab ID: 60246222001	Collected: 06/09/17 11:40	Received: 06/09/17 15:45	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.13	mg/L	0.0050	1	06/20/17 14:15	06/21/17 17:03	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	06/20/17 14:15	06/21/17 17:03	7440-41-7	
Boron, Total Recoverable	1.9	mg/L	0.10	1	06/20/17 14:15	06/21/17 17:03	7440-42-8	
Calcium, Total Recoverable	518	mg/L	0.10	1	06/20/17 14:15	06/21/17 17:03	7440-70-2	M1
Chromium, Total Recoverable	0.0023J	mg/L	0.0050	1	06/20/17 14:15	06/21/17 17:03	7440-47-3	
Lead, Total Recoverable	<0.0048	mg/L	0.010	2	06/20/17 14:15	06/22/17 16:55	7439-92-1	D3
Lithium	0.45	mg/L	0.010	1	06/20/17 14:15	06/21/17 17:03	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	0.00030J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7440-36-0	D3
Arsenic, Total Recoverable	0.00081J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7440-38-2	D3
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	06/19/17 10:45	06/26/17 13:08	7440-43-9	D3
Cobalt, Total Recoverable	0.0040J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7440-48-4	D3
Molybdenum, Total Recoverable	0.0052	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7782-49-2	D3
Thallium, Total Recoverable	0.00021J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:08	7440-28-0	D3
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	0.00011J	mg/L	0.00020	1	06/14/17 11:14	06/14/17 15:26	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	1490	mg/L	5.0	1		06/14/17 08:34		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.2	Std. Units	0.10	1		06/13/17 14:46		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	14300	mg/L	1000	1000		06/13/17 01:00	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		06/13/17 01:46	16984-48-8	
Sulfate	587	mg/L	50.0	50		06/13/17 00:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Sample: MW-36-060917	Lab ID: 60246222002	Collected: 06/09/17 12:43		Received: 06/09/17 15:45		Matrix: Water		
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.23	mg/L	0.0050	1	06/20/17 14:15	06/21/17 17:10	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	06/20/17 14:15	06/21/17 17:10	7440-41-7	
Boron, Total Recoverable	1.8	mg/L	0.20	2	06/20/17 14:15	06/22/17 16:58	7440-42-8	
Calcium, Total Recoverable	546	mg/L	0.10	1	06/20/17 14:15	06/21/17 17:10	7440-70-2	
Chromium, Total Recoverable	0.0032J	mg/L	0.010	2	06/20/17 14:15	06/22/17 16:58	7440-47-3	D3
Lead, Total Recoverable	<0.0048	mg/L	0.010	2	06/20/17 14:15	06/22/17 16:58	7439-92-1	D3
Lithium	0.45	mg/L	0.010	1	06/20/17 14:15	06/21/17 17:10	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00044J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7440-36-0	D3
Arsenic, Total Recoverable	0.0015J	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7440-38-2	D3
Cadmium, Total Recoverable	<0.00089	mg/L	0.0025	5	06/19/17 10:45	06/26/17 13:25	7440-43-9	D3
Cobalt, Total Recoverable	0.0088	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7440-48-4	
Molybdenum, Total Recoverable	0.0083	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	06/19/17 10:45	06/26/17 13:25	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	06/14/17 11:14	06/14/17 15:28	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	27700	mg/L	5.0	1		06/14/17 08:34		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		06/14/17 09:26		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14600	mg/L	1000	1000		06/13/17 16:07	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		06/13/17 02:01	16984-48-8	
Sulfate	464	mg/L	50.0	50		06/13/17 02:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480952 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1969978 Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.000024	0.00020	06/14/17 14:42	

LABORATORY CONTROL SAMPLE: 1969979

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0051	103	85-115	

MATRIX SPIKE SAMPLE: 1969980

Parameter	Units	60245960002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.024 ug/L	.005	0.0050	99	70-130	

MATRIX SPIKE SAMPLE: 1969981

Parameter	Units	60246130001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.20 ug/L	.005	0.0050	101	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 481746 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1973515 Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	06/21/17 17:00	
Beryllium	mg/L	<0.00016	0.0010	06/21/17 17:00	
Boron	mg/L	<0.0035	0.10	06/21/17 17:00	
Calcium	mg/L	<0.036	0.10	06/21/17 17:00	
Chromium	mg/L	<0.00072	0.0050	06/21/17 17:00	
Lead	mg/L	<0.0024	0.0050	06/21/17 17:00	
Lithium	mg/L	<0.0029	0.010	06/21/17 17:00	

LABORATORY CONTROL SAMPLE: 1973516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	102	85-115	
Beryllium	mg/L	1	1.0	101	85-115	
Boron	mg/L	1	0.98	98	85-115	
Calcium	mg/L	10	9.9	99	85-115	
Chromium	mg/L	1	0.99	99	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	1.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1973517 1973518

Parameter	Units	60246222001		1973518		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.13	1	1	1.1	1.1	101	101	70-130	0	20
Beryllium	mg/L	<0.00016	1	1	0.96	0.95	96	95	70-130	0	20
Boron	mg/L	1.9	1	1	2.8	2.9	96	101	70-130	2	20
Calcium	mg/L	518	10	10	513	516	-54	-29	70-130	0	20 M1
Chromium	mg/L	0.0023J	1	1	0.91	0.91	91	91	70-130	0	20
Lead	mg/L	<0.0048	1	1	0.82	0.83	82	82	70-130	1	20
Lithium	mg/L	0.45	1	1	1.7	1.7	128	130	70-130	1	20

MATRIX SPIKE SAMPLE: 1973519

Parameter	Units	60246614001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	33.1 ug/L	1	1.0	101	70-130	
Beryllium	mg/L	ND	1	0.99	99	70-130	
Boron	mg/L	5420 ug/L	1	6.4	96	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

MATRIX SPIKE SAMPLE:		1973519					
Parameter	Units	60246614001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Calcium	mg/L	318000 ug/L	10	326	77	70-130	
Chromium	mg/L	ND	1	0.96	96	70-130	
Lead	mg/L	ND	1	0.93	93	70-130	
Lithium	mg/L	63.2 ug/L	1	1.2	110	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 481519 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1972876 Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	06/21/17 14:35	
Arsenic	mg/L	<0.000052	0.0010	06/21/17 14:35	
Cadmium	mg/L	<0.000018	0.00050	06/21/17 14:35	
Cobalt	mg/L	<0.000014	0.0010	06/21/17 14:35	
Molybdenum	mg/L	<0.000058	0.0010	06/21/17 14:35	
Selenium	mg/L	<0.000086	0.0010	06/21/17 14:35	
Thallium	mg/L	0.000037J	0.0010	06/21/17 14:35	

LABORATORY CONTROL SAMPLE: 1972877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.040	99	85-115	
Cadmium	mg/L	.04	0.040	99	85-115	
Cobalt	mg/L	.04	0.040	99	85-115	
Molybdenum	mg/L	.04	0.042	104	85-115	
Selenium	mg/L	.04	0.040	99	85-115	
Thallium	mg/L	.04	0.038	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1972878 1972879

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Antimony	mg/L	ND	.04	.04	0.040	0.040	99	99	70-130	1	20
Arsenic	mg/L	1.4 ug/L	.04	.04	0.040	0.041	98	98	70-130	1	20
Cadmium	mg/L	ND	.04	.04	0.037	0.037	92	93	70-130	0	20
Cobalt	mg/L	ND	.04	.04	0.038	0.038	94	94	70-130	0	20
Molybdenum	mg/L	4.3 ug/L	.04	.04	0.049	0.049	111	111	70-130	0	20
Selenium	mg/L	ND	.04	.04	0.037	0.037	91	91	70-130	1	20
Thallium	mg/L	ND	.04	.04	0.041	0.041	102	102	70-130	0	20

MATRIX SPIKE SAMPLE: 1972880

Parameter	Units	60246474001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	<1.0 ug/L	.04	0.040	98	70-130	
Arsenic	mg/L	<1.0 ug/L	.04	0.040	99	70-130	
Cadmium	mg/L	<0.50 ug/L	.04	0.037	93	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

MATRIX SPIKE SAMPLE:		1972880					
Parameter	Units	60246474001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	<1.0 ug/L	.04	0.038	94	70-130	
Molybdenum	mg/L	2.4 ug/L	.04	0.046	109	70-130	
Selenium	mg/L	<1.0 ug/L	.04	0.038	93	70-130	
Thallium	mg/L	<1.0 ug/L	.04	0.040	101	70-130	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480914

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1969866

Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	06/14/17 08:28	

LABORATORY CONTROL SAMPLE: 1969867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 1969868

Parameter	Units	60246227005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	382	396	4	10	

SAMPLE DUPLICATE: 1969869

Parameter	Units	60246186001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	473	436	8	10	

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480836 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60246222001

SAMPLE DUPLICATE: 1969559

Parameter	Units	60245357003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.3	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480913 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60246222002

SAMPLE DUPLICATE: 1969865

Parameter	Units	60245968002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.8	6.8	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480615

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1968961

Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	06/12/17 08:52	
Fluoride	mg/L	<0.10	0.20	06/12/17 08:52	
Sulfate	mg/L	<0.50	1.0	06/12/17 08:52	

LABORATORY CONTROL SAMPLE: 1968962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1968963 1968964

Parameter	Units	60246016001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	20.5	25	25	25	46.8	46.6	105	104	80-120	0	15			
Fluoride	mg/L	0.26	2.5	2.5	2.5	2.8	2.8	102	103	80-120	1	15			
Sulfate	mg/L	49.2	25	25	25	74.8	74.6	102	101	80-120	0	15			

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QUALITY CONTROL DATA

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 480760

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60246222002

METHOD BLANK: 1969311

Matrix: Water

Associated Lab Samples: 60246222002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	06/13/17 09:11	

LABORATORY CONTROL SAMPLE: 1969312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1969313 1969314

Parameter	Units	60246271001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	18.1	50	50	66.8	66.5	98	97	80-120	1	15				

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Sample: MW-35-060917 **Lab ID: 60246222001** Collected: 06/09/17 11:40 Received: 06/09/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	34.1 ± 4.87 (0.662) C:NA T:98%	pCi/L	06/21/17 22:47	13982-63-3	
Radium-228	EPA 904.0	60.6 ± 11.0 (0.912) C:76% T:84%	pCi/L	06/24/17 19:09	15262-20-1	
Total Radium	Total Radium Calculation	94.7 ± 15.9 (1.57)	pCi/L	06/28/17 14:21	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Sample: MW-36-060917 **Lab ID: 60246222002** Collected: 06/09/17 12:43 Received: 06/09/17 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	28.1 ± 4.19 (0.586) C:NA T:97%	pCi/L	06/21/17 23:01	13982-63-3	
Radium-228	EPA 904.0	52.6 ± 9.57 (0.735) C:79% T:86%	pCi/L	06/24/17 19:09	15262-20-1	
Total Radium	Total Radium Calculation	80.7 ± 13.8 (1.32)	pCi/L	06/28/17 14:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch:	261823	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60246222001, 60246222002		

METHOD BLANK:	1289181	Matrix:	Water
Associated Lab Samples:	60246222001, 60246222002		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.587 ± 0.340 (0.613) C:78% T:82%	pCi/L	06/24/17 19:09	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

QC Batch: 261819

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60246222001, 60246222002

METHOD BLANK: 1289173

Matrix: Water

Associated Lab Samples: 60246222001, 60246222002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.137 ± 0.313 (0.738) C:NA T:92%	pCi/L	06/21/17 22:29	

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QUALIFIERS

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR GROUNDWATER

Pace Project No.: 60246222

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60246222001	MW-35-060917	EPA 200.7	481746	EPA 200.7	481947
60246222002	MW-36-060917	EPA 200.7	481746	EPA 200.7	481947
60246222001	MW-35-060917	EPA 200.8	481519	EPA 200.8	481633
60246222002	MW-36-060917	EPA 200.8	481519	EPA 200.8	481633
60246222001	MW-35-060917	EPA 245.1	480952	EPA 245.1	481024
60246222002	MW-36-060917	EPA 245.1	480952	EPA 245.1	481024
60246222001	MW-35-060917	EPA 903.1	261819		
60246222002	MW-36-060917	EPA 903.1	261819		
60246222001	MW-35-060917	EPA 904.0	261823		
60246222002	MW-36-060917	EPA 904.0	261823		
60246222001	MW-35-060917	Total Radium Calculation	263482		
60246222002	MW-36-060917	Total Radium Calculation	263482		
60246222001	MW-35-060917	SM 2540C	480914		
60246222002	MW-36-060917	SM 2540C	480914		
60246222001	MW-35-060917	SM 4500-H+B	480836		
60246222002	MW-36-060917	SM 4500-H+B	480913		
60246222001	MW-35-060917	EPA 300.0	480615		
60246222002	MW-36-060917	EPA 300.0	480615		
60246222002	MW-36-060917	EPA 300.0	480760		

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Sample Condition Upon Receipt

WO#: 60246222



Client Name: Westat

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

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

Cooler Temperature (°C): As-read 1.6 Corr. Factor CF +2.9 / CF +0.2 Corrected 1.6

Date and initials of person examining contents: RB 6/10/17

Temperature should be above freezing to 6°C

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

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

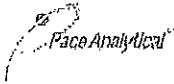
Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AMW

Date: 6/12/17

Sample Condition Upon Receipt Pittsburgh



Client Name: PACE - KANSAS

Project # 30221429 - 1

ZH.

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728565932448

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

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

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

Temp should be above freezing to 6°C

Date and Initials of person examining contents: ZH 6/13/17

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

PHLZ

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.

ATTACHMENT 1-10
July 2017 Sampling Event
Laboratory Analytical Report

August 22, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60248763

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 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.

Revised Report_rev.1 Per the client's request, the samples 60248763-001 and -002 were re-evaluated down to the MDL.

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

Sincerely,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60248763

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

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: LEC CCR Groundwater

Pace Project No.: 60248763

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60248763001	MW-35-071417	Water	07/14/17 09:57	07/14/17 16:20
60248763002	MW-36-071417	Water	07/14/17 10:44	07/14/17 16:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60248763001	MW-35-071417	EPA 200.7	JGP	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		60248763002	MW-36-071417	EPA 200.7	JGP
EPA 200.8	JGP			7	PASI-K
EPA 245.1	SMW			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	RMK			1	PASI-PA
SM 2540C	JSS			1	PASI-K
SM 4500-H+B	HMM			1	PASI-K
EPA 300.0	OL			3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Sample: MW-35-071417	Lab ID: 60248763001	Collected: 07/14/17 09:57	Received: 07/14/17 16:20	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total								
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium, Total Recoverable	0.12	mg/L	0.0050	1	07/27/17 12:22	07/30/17 17:58	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	07/27/17 12:22	07/30/17 17:58	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.10	1	07/27/17 12:22	07/30/17 17:58	7440-42-8	
Calcium, Total Recoverable	513	mg/L	0.10	1	07/27/17 12:22	07/30/17 17:58	7440-70-2	M1
Chromium, Total Recoverable	<0.00072	mg/L	0.0050	1	07/27/17 12:22	07/30/17 17:58	7440-47-3	
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	07/27/17 12:22	07/30/17 17:58	7439-92-1	
Lithium	0.43	mg/L	0.010	1	07/27/17 12:22	07/30/17 17:58	7439-93-2	
200.8 MET ICPMS								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony, Total Recoverable	<0.00053	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7440-36-0	D3
Arsenic, Total Recoverable	0.0016J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7440-38-2	D3
Cadmium, Total Recoverable	<0.00036	mg/L	0.010	20	07/19/17 10:57	07/20/17 16:20	7440-43-9	D3
Cobalt, Total Recoverable	0.0041J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7440-48-4	D3
Molybdenum, Total Recoverable	0.0058J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7439-98-7	D3
Selenium, Total Recoverable	<0.0017	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7782-49-2	D3
Thallium, Total Recoverable	<0.00073	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:20	7440-28-0	D3
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	<0.000024	mg/L	0.00020	1	07/25/17 17:15	07/26/17 15:38	7439-97-6	
2540C Total Dissolved Solids								
Analytical Method: SM 2540C								
Total Dissolved Solids	24900	mg/L	5.0	1		07/18/17 08:47		
4500H+ pH, Electrometric								
Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	7.1	Std. Units	0.10	1		07/18/17 09:03		H6
300.0 IC Anions 28 Days								
Analytical Method: EPA 300.0								
Chloride	14900	mg/L	1000	1000		07/31/17 11:33	16887-00-6	
Fluoride	1.6J	mg/L	2.0	10		07/31/17 11:04	16984-48-8	D3
Sulfate	666	mg/L	50.0	50		07/31/17 11:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Sample: MW-36-071417		Lab ID: 60248763002		Collected: 07/14/17 10:44		Received: 07/14/17 16:20		Matrix: Water	
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium, Total Recoverable	0.20	mg/L	0.0050	1	07/27/17 12:22	07/30/17 18:10	7440-39-3		
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	07/27/17 12:22	07/30/17 18:10	7440-41-7		
Boron, Total Recoverable	1.6	mg/L	0.10	1	07/27/17 12:22	07/30/17 18:10	7440-42-8		
Calcium, Total Recoverable	554	mg/L	0.10	1	07/27/17 12:22	07/30/17 18:10	7440-70-2		
Chromium, Total Recoverable	0.0014J	mg/L	0.0050	1	07/27/17 12:22	07/30/17 18:10	7440-47-3		
Lead, Total Recoverable	0.0036J	mg/L	0.0050	1	07/27/17 12:22	07/30/17 18:10	7439-92-1		
Lithium	0.41	mg/L	0.010	1	07/27/17 12:22	07/30/17 18:10	7439-93-2		
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony, Total Recoverable	0.00060J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:28	7440-36-0	D3	
Arsenic, Total Recoverable	0.0034J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:28	7440-38-2	D3	
Cadmium, Total Recoverable	<0.00036	mg/L	0.010	20	07/19/17 10:57	07/20/17 16:28	7440-43-9	D3	
Cobalt, Total Recoverable	0.0091J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:28	7440-48-4	D3	
Molybdenum, Total Recoverable	0.011J	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:28	7439-98-7	D3	
Selenium, Total Recoverable	<0.0017	mg/L	0.020	20	07/19/17 10:57	07/20/17 16:28	7782-49-2	D3	
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	07/19/17 10:57	07/21/17 11:19	7440-28-0	D3	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Mercury	<0.000024	mg/L	0.00020	1	07/25/17 17:15	07/26/17 15:41	7439-97-6		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	25800	mg/L	5.0	1		07/18/17 08:48			
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
pH at 25 Degrees C	7.0	Std. Units	0.10	1		07/18/17 09:05		H6	
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Chloride	13600	mg/L	1000	1000		07/31/17 12:56	16887-00-6		
Fluoride	1.6J	mg/L	2.0	10		07/31/17 12:27	16984-48-8	D3	
Sulfate	502	mg/L	50.0	50		07/31/17 12:42	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 486931 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1994327 Matrix: Water

Associated Lab Samples: 60248763001, 60248763002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.000024	0.00020	07/26/17 15:23	

LABORATORY CONTROL SAMPLE: 1994328

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0048	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994329 1994330

Parameter	Units	60248730001		60248730003		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Mercury	mg/L	ND	.005	.005	0.0049	0.0050	98	100	70-130	2	20		

MATRIX SPIKE SAMPLE: 1994331

Parameter	Units	60249386003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0024	47	70-130	M1

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: LEC CCR Groundwater
Pace Project No.: 60248763

QC Batch: 487042 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1994745 Matrix: Water
Associated Lab Samples: 60248763001, 60248763002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	07/30/17 17:54	
Beryllium	mg/L	<0.00016	0.0010	07/30/17 17:54	
Boron	mg/L	<0.0035	0.10	07/30/17 17:54	
Calcium	mg/L	<0.036	0.10	07/30/17 17:54	
Chromium	mg/L	<0.00072	0.0050	07/30/17 17:54	
Lead	mg/L	<0.0024	0.0050	07/30/17 17:54	
Lithium	mg/L	<0.0029	0.010	07/30/17 17:54	

LABORATORY CONTROL SAMPLE: 1994746

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.98	98	85-115	
Beryllium	mg/L	1	1.0	100	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	9.9	99	85-115	
Chromium	mg/L	1	0.97	97	85-115	
Lead	mg/L	1	1.0	101	85-115	
Lithium	mg/L	1	1.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1994747 1994748

Parameter	Units	60248763001		1994748		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Barium	mg/L	0.12	1	1	1.1	1.1	97	95	70-130	2	20	
Beryllium	mg/L	<0.00016	1	1	0.97	0.95	97	95	70-130	2	20	
Boron	mg/L	1.7	1	1	2.6	2.5	87	84	70-130	1	20	
Calcium	mg/L	513	10	10	503	500	-104	-137	70-130	1	20	M1
Chromium	mg/L	<0.00072	1	1	0.93	0.91	93	91	70-130	3	20	
Lead	mg/L	<0.0024	1	1	0.84	0.82	84	82	70-130	3	20	
Lithium	mg/L	0.43	1	1	1.6	1.5	115	108	70-130	4	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: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 486060 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1990507 Matrix: Water

Associated Lab Samples: 60248763001, 60248763002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	07/20/17 13:54	
Arsenic	mg/L	<0.000052	0.0010	07/20/17 13:54	
Cadmium	mg/L	<0.000018	0.00050	07/20/17 13:54	
Cobalt	mg/L	<0.000014	0.0010	07/20/17 13:54	
Molybdenum	mg/L	<0.000058	0.0010	07/20/17 13:54	
Selenium	mg/L	<0.000086	0.0010	07/20/17 13:54	
Thallium	mg/L	0.000051J	0.0010	07/20/17 13:54	

LABORATORY CONTROL SAMPLE: 1990508

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.039	97	85-115	
Arsenic	mg/L	.04	0.039	97	85-115	
Cadmium	mg/L	.04	0.039	97	85-115	
Cobalt	mg/L	.04	0.041	103	85-115	
Molybdenum	mg/L	.04	0.042	105	85-115	
Selenium	mg/L	.04	0.036	89	85-115	
Thallium	mg/L	.04	0.041	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1990509 1990510

Parameter	Units	60248566001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	mg/L	6.9 ug/L	.04	.04	0.045	0.045	95	95	70-130	0	20		
Arsenic	mg/L	17.5 ug/L	.04	.04	0.056	0.056	95	96	70-130	1	20		
Cadmium	mg/L	<1.0 ug/L	.04	.04	0.036	0.036	90	90	70-130	1	20		
Cobalt	mg/L	<2.0 ug/L	.04	.04	0.039	0.040	96	97	70-130	1	20		
Molybdenum	mg/L	49.0 ug/L	.04	.04	0.093	0.093	109	111	70-130	1	20		
Selenium	mg/L	5.7 ug/L	.04	.04	0.040	0.040	85	86	70-130	1	20		
Thallium	mg/L	<2.0 ug/L	.04	.04	0.045	0.046	112	114	70-130	2	20		

MATRIX SPIKE SAMPLE: 1990511

Parameter	Units	60248763002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.00060J	.04	0.038	94	70-130	
Arsenic	mg/L	0.0034J	.04	0.042	98	70-130	
Cadmium	mg/L	<0.00036	.04	0.035	86	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60248763

MATRIX SPIKE SAMPLE:		1990511					
Parameter	Units	60248763002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cobalt	mg/L	0.0091J	.04	0.046	92	70-130	
Molybdenum	mg/L	0.011J	.04	0.054	107	70-130	
Selenium	mg/L	<0.0017	.04	0.033	78	70-130	
Thallium	mg/L	<0.00018	.04	0.035	88	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 485816

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1989766

Matrix: Water

Associated Lab Samples: 60248763001, 60248763002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	07/18/17 08:44	

LABORATORY CONTROL SAMPLE: 1989767

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	951	95	80-120	

SAMPLE DUPLICATE: 1989768

Parameter	Units	60248738001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3140	3050	3	10	

SAMPLE DUPLICATE: 1989769

Parameter	Units	60248825001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	904	898	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 485704 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60248763001, 60248763002

SAMPLE DUPLICATE: 1989393

Parameter	Units	60248647002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.7	8.7	0	5	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60248763

QC Batch: 487607 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1997075 Matrix: Water
Associated Lab Samples: 60248763001, 60248763002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	07/31/17 07:49	
Fluoride	mg/L	<0.10	0.20	07/31/17 07:49	
Sulfate	mg/L	<0.50	1.0	07/31/17 07:49	

LABORATORY CONTROL SAMPLE: 1997076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1997120 1997121

Parameter	Units	60249581001		60249581002		MSD		MS		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Chloride	mg/L	895	250	250	1340	1090	177	79	80-120	20	15	M1,R1	
Fluoride	mg/L	ND	125	125	137	136	110	109	80-120	1	15		
Sulfate	mg/L	834	250	250	1230	1020	160	73	80-120	19	15	M1,R1	

MATRIX SPIKE SAMPLE: 1997122

Parameter	Units	60249581002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	869	250	1100	90	80-120	
Fluoride	mg/L	ND	125	132	105	80-120	
Sulfate	mg/L	658	250	876	87	80-120	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Sample: MW-35-071417 **Lab ID: 60248763001** Collected: 07/14/17 09:57 Received: 07/14/17 16:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	31.1 ± 4.51 (0.792) C:NA T:89%	pCi/L	07/31/17 23:13	13982-63-3	
Radium-228	EPA 904.0	73.6 ± 13.3 (0.789) C:77% T:86%	pCi/L	08/01/17 11:32	15262-20-1	
Total Radium	Total Radium Calculation	105 ± 17.8 (1.58)	pCi/L	08/04/17 12:01	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Sample: MW-36-071417 **Lab ID: 60248763002** Collected: 07/14/17 10:44 Received: 07/14/17 16:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	35.1 ± 4.98 (0.798) C:NA T:94%	pCi/L	07/31/17 23:29	13982-63-3	
Radium-228	EPA 904.0	55.1 ± 10.0 (0.871) C:82% T:87%	pCi/L	08/01/17 11:32	15262-20-1	
Total Radium	Total Radium Calculation	90.2 ± 15.0 (1.67)	pCi/L	08/04/17 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 265644

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1308210

Matrix: Water

Associated Lab Samples: 60248763001, 60248763002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.209 ± 0.373 (0.816) C:81% T:70%	pCi/L	08/01/17 11:32	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60248763

QC Batch: 265633

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60248763001, 60248763002

METHOD BLANK: 1308197

Matrix: Water

Associated Lab Samples: 60248763001, 60248763002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.130 ± 0.297 (0.176) C:NA T:95%	pCi/L	07/31/17 23:13	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60248763

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60248763

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60248763001	MW-35-071417	EPA 200.7	487042	EPA 200.7	487303
60248763002	MW-36-071417	EPA 200.7	487042	EPA 200.7	487303
60248763001	MW-35-071417	EPA 200.8	486060	EPA 200.8	486160
60248763002	MW-36-071417	EPA 200.8	486060	EPA 200.8	486160
60248763001	MW-35-071417	EPA 245.1	486931	EPA 245.1	487027
60248763002	MW-36-071417	EPA 245.1	486931	EPA 245.1	487027
60248763001	MW-35-071417	EPA 903.1	265633		
60248763002	MW-36-071417	EPA 903.1	265633		
60248763001	MW-35-071417	EPA 904.0	265644		
60248763002	MW-36-071417	EPA 904.0	265644		
60248763001	MW-35-071417	Total Radium Calculation	267345		
60248763002	MW-36-071417	Total Radium Calculation	267345		
60248763001	MW-35-071417	SM 2540C	485816		
60248763002	MW-36-071417	SM 2540C	485816		
60248763001	MW-35-071417	SM 4500-H+B	485704		
60248763002	MW-36-071417	SM 4500-H+B	485704		
60248763001	MW-35-071417	EPA 300.0	487607		
60248763002	MW-36-071417	EPA 300.0	487607		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60248763



Client Name: Westar Energy

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

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

Cooler Temperature (°C): As-read 3.8 Corr. Factor CF +2.9 CF +0.2 Corrected 4.0

Date and initials of person examining contents:

pu 7/15/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<u>pu 7/15/17</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <u>PH</u>
Rush Turn Around Time requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

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

Person Contacted: _____ Date/Time: _____

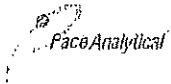
Comments/ Resolution: _____

Project Manager Review: [Signature]

Date: 7/17/17

Sample Condition Upon Receipt Pittsburgh

30224447



Client Name: PACE - KS

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728565943158

Label <u>Z.H.</u>
LIMS Login <u>PHV</u>

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

Thermometer Used _____ 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 7/18/17

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

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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

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.

August 21, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60249708

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on July 28, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60249708

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

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60249708001	MW-35-072717	Water	07/27/17 08:39	07/28/17 08:00
60249708002	MW-36-072717	Water	07/27/17 09:25	07/28/17 08:00
60249708003	DUP-072717	Water	07/27/17 06:00	07/28/17 08:00

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60249708001	MW-35-072717	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	NSM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JMC1	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		60249708002	MW-36-072717	EPA 200.7	SMW
EPA 200.8	JGP			7	PASI-K
EPA 245.1	NSM			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	JMC1			1	PASI-K
SM 4500-H+B	HMM			1	PASI-K
EPA 300.0	OL			3	PASI-K
60249708003	DUP-072717			EPA 200.7	SMW
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	NSM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JMC1	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: MW-35-072717		Lab ID: 60249708001		Collected: 07/27/17 08:39		Received: 07/28/17 08:00		Matrix: Water	
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium, Total Recoverable	0.12	mg/L	0.0050	1	07/31/17 16:51	08/13/17 15:22	7440-39-3		
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	07/31/17 16:51	08/13/17 15:22	7440-41-7		
Boron, Total Recoverable	1.8	mg/L	0.20	2	07/31/17 16:51	08/16/17 18:44	7440-42-8		
Calcium, Total Recoverable	480	mg/L	0.10	1	07/31/17 16:51	08/13/17 15:22	7440-70-2	M1	
Chromium, Total Recoverable	0.0015J	mg/L	0.010	2	07/31/17 16:51	08/16/17 18:44	7440-47-3		
Lead, Total Recoverable	<0.0048	mg/L	0.010	2	07/31/17 16:51	08/16/17 18:44	7439-92-1	D3	
Lithium	0.42	mg/L	0.010	1	07/31/17 16:51	08/13/17 15:22	7439-93-2		
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Total Recoverable	<0.00013	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7440-36-0	D3	
Arsenic, Total Recoverable	0.00096J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7440-38-2	D3	
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	07/31/17 10:19	08/03/17 17:52	7440-43-9	D3	
Cobalt, Total Recoverable	0.0040J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7440-48-4	D3	
Molybdenum, Total Recoverable	0.0043J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7439-98-7	D3	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7782-49-2	D3	
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:52	7440-28-0	D3	
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1							
Mercury	<0.000024	mg/L	0.00020	1	08/16/17 19:00	08/17/17 09:22	7439-97-6	M1	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	24400	mg/L	5.0	1		08/02/17 15:29			
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1	Std. Units	0.10	1		07/29/17 16:07		H6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	14300	mg/L	1000	1000		08/06/17 21:19	16887-00-6		
Fluoride	<0.10	mg/L	0.20	1		08/05/17 22:46	16984-48-8		
Sulfate	619	mg/L	100	100		08/06/17 20:40	14808-79-8		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: MW-36-072717		Lab ID: 60249708002	Collected: 07/27/17 09:25	Received: 07/28/17 08:00	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.21	mg/L	0.010	2	07/31/17 16:51	08/16/17 18:47	7440-39-3	
Beryllium, Total Recoverable	<0.00033	mg/L	0.0020	2	07/31/17 16:51	08/16/17 18:47	7440-41-7	D3
Boron, Total Recoverable	1.7	mg/L	0.20	2	07/31/17 16:51	08/16/17 18:47	7440-42-8	
Calcium, Total Recoverable	621	mg/L	0.20	2	07/31/17 16:51	08/16/17 18:47	7440-70-2	
Chromium, Total Recoverable	0.0022J	mg/L	0.010	2	07/31/17 16:51	08/16/17 18:47	7440-47-3	
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	07/31/17 16:51	08/13/17 15:34	7439-92-1	
Lithium	0.38	mg/L	0.020	2	07/31/17 16:51	08/16/17 18:47	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00015J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7440-36-0	D3
Arsenic, Total Recoverable	0.0025J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7440-38-2	D3
Cadmium, Total Recoverable	<0.00089	mg/L	0.0025	5	07/31/17 10:19	08/03/17 17:59	7440-43-9	D3
Cobalt, Total Recoverable	0.0075	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7440-48-4	
Molybdenum, Total Recoverable	0.0070	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	07/31/17 10:19	08/03/17 17:59	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	08/16/17 19:00	08/17/17 09:29	7439-97-6	M1
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	26800	mg/L	5.0	1		08/02/17 15:30		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		07/29/17 16:10		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14000	mg/L	1000	1000		08/06/17 22:36	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		08/05/17 23:01	16984-48-8	
Sulfate	481	mg/L	50.0	50		08/06/17 22:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: DUP-072717		Lab ID: 60249708003	Collected: 07/27/17 06:00	Received: 07/28/17 08:00	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.17	mg/L	0.0050	1	07/31/17 16:51	08/13/17 15:36	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	07/31/17 16:51	08/13/17 15:36	7440-41-7	
Boron, Total Recoverable	1.7	mg/L	0.20	2	07/31/17 16:51	08/16/17 18:49	7440-42-8	
Calcium, Total Recoverable	548	mg/L	0.10	1	07/31/17 16:51	08/13/17 15:36	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	07/31/17 16:51	08/16/17 18:49	7440-47-3	D3
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	07/31/17 16:51	08/13/17 15:36	7439-92-1	
Lithium	0.33	mg/L	0.010	1	07/31/17 16:51	08/13/17 15:36	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00026J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7440-36-0	D3
Arsenic, Total Recoverable	0.0022J	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7440-38-2	D3
Cadmium, Total Recoverable	<0.00089	mg/L	0.0025	5	07/31/17 10:19	08/03/17 18:05	7440-43-9	D3
Cobalt, Total Recoverable	0.0086	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7440-48-4	
Molybdenum, Total Recoverable	0.0081	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	07/31/17 10:19	08/03/17 18:05	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	08/16/17 19:00	08/17/17 09:33	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	24600	mg/L	5.0	1		08/02/17 15:30		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.0	Std. Units	0.10	1		07/29/17 16:01		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14800	mg/L	1000	1000		08/06/17 23:02	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		08/05/17 23:16	16984-48-8	
Sulfate	510	mg/L	50.0	50		08/06/17 22:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 490179 Analysis Method: EPA 245.1
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
 Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 2006565 Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.000024	0.00020	08/17/17 09:18	

LABORATORY CONTROL SAMPLE: 2006566

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0052	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2006567 2006568

Parameter	Units	2006567		2006568		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60249708001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/L	<0.000024	.005	.005	0.0027	0.0027	54	54	70-130	1	20 M1

MATRIX SPIKE SAMPLE: 2006569

Parameter	Units	60249708002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	<0.000024	.005	0.0025	50	70-130	M1

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 487830 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 1997596 Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	08/13/17 15:20	
Beryllium	mg/L	<0.00016	0.0010	08/13/17 15:20	
Boron	mg/L	<0.0035	0.10	08/13/17 15:20	
Calcium	mg/L	<0.036	0.10	08/13/17 15:20	
Chromium	mg/L	<0.00072	0.0050	08/13/17 15:20	
Lead	mg/L	<0.0024	0.0050	08/13/17 15:20	
Lithium	mg/L	<0.0029	0.010	08/13/17 15:20	

LABORATORY CONTROL SAMPLE: 1997597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	102	85-115	
Beryllium	mg/L	1	1.0	102	85-115	
Boron	mg/L	1	0.97	97	85-115	
Calcium	mg/L	10	9.6	96	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	1.0	104	85-115	
Lithium	mg/L	1	1.1	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1997598 1997599

Parameter	Units	60249708001		1997598		1997599		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Barium	mg/L	0.12	1	1	1	1.1	1.2	100	104	70-130	4	20	
Beryllium	mg/L	<0.00016	1	1	1	0.98	1.0	98	104	70-130	6	20	
Boron	mg/L	1.8	1	1	1	2.8	2.8	98	105	70-130	3	20	
Calcium	mg/L	480	10	10	10	508	587	280	1070	70-130	15	20 M1	
Chromium	mg/L	0.0015J	1	1	1	1.0	1.0	101	103	70-130	1	20	
Lead	mg/L	<0.0048	1	1	1	0.89	0.90	89	90	70-130	1	20	
Lithium	mg/L	0.42	1	1	1	1.5	1.5	111	105	70-130	5	20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 487637 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 1997155 Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	08/01/17 10:32	
Arsenic	mg/L	<0.000052	0.0010	08/01/17 10:32	
Cadmium	mg/L	<0.000018	0.00050	08/01/17 10:32	
Cobalt	mg/L	<0.000014	0.0010	08/01/17 10:32	
Molybdenum	mg/L	0.00013J	0.0010	08/01/17 10:32	
Selenium	mg/L	<0.000086	0.0010	08/01/17 10:32	
Thallium	mg/L	0.00026J	0.0010	08/01/17 10:32	

LABORATORY CONTROL SAMPLE: 1997156

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	99	85-115	
Arsenic	mg/L	.04	0.040	100	85-115	
Cadmium	mg/L	.04	0.039	98	85-115	
Cobalt	mg/L	.04	0.040	99	85-115	
Molybdenum	mg/L	.04	0.040	100	85-115	
Selenium	mg/L	.04	0.039	97	85-115	
Thallium	mg/L	.04	0.036	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1997157 1997158

Parameter	Units	60249776001		1997157		1997158		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/L	ND	.04	.04	0.040	0.040	97	98	70-130	1	20		
Arsenic	mg/L	57.9 ug/L	.04	.04	0.099	0.099	103	102	70-130	1	20		
Cadmium	mg/L	ND	.04	.04	0.038	0.038	95	94	70-130	2	20		
Cobalt	mg/L	7.3 ug/L	.04	.04	0.046	0.046	96	96	70-130	1	20		
Molybdenum	mg/L	ND	.04	.04	0.042	0.042	102	103	70-130	0	20		
Selenium	mg/L	ND	.04	.04	0.038	0.041	94	100	70-130	6	20		
Thallium	mg/L	ND	.04	.04	0.036	0.037	90	91	70-130	1	20		

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 488160

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 1998724

Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/02/17 15:27	

LABORATORY CONTROL SAMPLE: 1998725

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

SAMPLE DUPLICATE: 1998726

Parameter	Units	60249753001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	686	697	2	10	

SAMPLE DUPLICATE: 1998727

Parameter	Units	60249753005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	666	656	2	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 487571 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60249708001, 60249708002, 60249708003

SAMPLE DUPLICATE: 1996835

Parameter	Units	60249596001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 488540 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 2000546 Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.10	0.20	08/05/17 17:38	

LABORATORY CONTROL SAMPLE: 2000547

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	103	90-110	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 488592 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 2000742 Matrix: Water
 Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	08/06/17 20:14	
Sulfate	mg/L	<0.50	1.0	08/06/17 20:14	

LABORATORY CONTROL SAMPLE: 2000743

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2000744 2000745

Parameter	Units	60249708001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	14300	5000	5000	20000	19800	115	111	80-120	1	15	
Sulfate	mg/L	619	500	500	1070	1080	90	93	80-120	1	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: MW-35-072717 **Lab ID: 60249708001** Collected: 07/27/17 08:39 Received: 07/28/17 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	33.6 ± 4.68 (0.724) C:NA T:97%	pCi/L	08/16/17 10:27	13982-63-3	
Radium-228	EPA 904.0	61.0 ± 11.1 (0.504) C:82% T:85%	pCi/L	08/11/17 15:21	15262-20-1	
Total Radium	Total Radium Calculation	94.6 ± 15.8 (1.23)	pCi/L	08/21/17 12:03	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: MW-36-072717 **Lab ID: 60249708002** Collected: 07/27/17 09:25 Received: 07/28/17 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	36.9 ± 5.49 (1.08) C:NA T:94%	pCi/L	08/16/17 10:27	13982-63-3	
Radium-228	EPA 904.0	54.3 ± 9.85 (0.522) C:78% T:92%	pCi/L	08/11/17 15:21	15262-20-1	
Total Radium	Total Radium Calculation	91.2 ± 15.3 (1.60)	pCi/L	08/21/17 12:03	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Sample: DUP-072717 **Lab ID: 60249708003** Collected: 07/27/17 06:00 Received: 07/28/17 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	34.1 ± 4.73 (0.477) C:NA T:96%	pCi/L	08/16/17 10:46	13982-63-3	
Radium-228	EPA 904.0	45.7 ± 8.34 (0.598) C:76% T:90%	pCi/L	08/11/17 15:21	15262-20-1	
Total Radium	Total Radium Calculation	79.8 ± 13.1 (1.08)	pCi/L	08/21/17 12:03	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60249708

QC Batch: 267154

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60249708001, 60249708002, 60249708003

METHOD BLANK: 1315209

Matrix: Water

Associated Lab Samples: 60249708001, 60249708002, 60249708003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.545 ± 0.365 (0.699) C:77% T:82%	pCi/L	08/11/17 15:20	

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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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60249708

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60249708

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60249708001	MW-35-072717	EPA 200.7	487830	EPA 200.7	487911
60249708002	MW-36-072717	EPA 200.7	487830	EPA 200.7	487911
60249708003	DUP-072717	EPA 200.7	487830	EPA 200.7	487911
60249708001	MW-35-072717	EPA 200.8	487637	EPA 200.8	487864
60249708002	MW-36-072717	EPA 200.8	487637	EPA 200.8	487864
60249708003	DUP-072717	EPA 200.8	487637	EPA 200.8	487864
60249708001	MW-35-072717	EPA 245.1	490179	EPA 245.1	490214
60249708002	MW-36-072717	EPA 245.1	490179	EPA 245.1	490214
60249708003	DUP-072717	EPA 245.1	490179	EPA 245.1	490214
60249708001	MW-35-072717	EPA 903.1	267153		
60249708002	MW-36-072717	EPA 903.1	267153		
60249708003	DUP-072717	EPA 903.1	267153		
60249708001	MW-35-072717	EPA 904.0	267154		
60249708002	MW-36-072717	EPA 904.0	267154		
60249708003	DUP-072717	EPA 904.0	267154		
60249708001	MW-35-072717	Total Radium Calculation	268953		
60249708002	MW-36-072717	Total Radium Calculation	268953		
60249708003	DUP-072717	Total Radium Calculation	268953		
60249708001	MW-35-072717	SM 2540C	488160		
60249708002	MW-36-072717	SM 2540C	488160		
60249708003	DUP-072717	SM 2540C	488160		
60249708001	MW-35-072717	SM 4500-H+B	487571		
60249708002	MW-36-072717	SM 4500-H+B	487571		
60249708003	DUP-072717	SM 4500-H+B	487571		
60249708001	MW-35-072717	EPA 300.0	488540		
60249708001	MW-35-072717	EPA 300.0	488592		
60249708002	MW-36-072717	EPA 300.0	488540		
60249708002	MW-36-072717	EPA 300.0	488592		
60249708003	DUP-072717	EPA 300.0	488540		
60249708003	DUP-072717	EPA 300.0	488592		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60249708



60249708

Client Name: Westar Energy

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

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

Cooler Temperature (°C): As-read 1-2 Corr. Factor CF 0.0 / CF +0.3 Corrected 1.2

Date and initials of person examining contents: HV
7/28/17

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature]

Date: 7/28/17

Chain of Custody



Workorder: 60249708

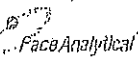
Workorder Name: LEC CCR Groundwater

Owner Received Date: 7/28/2017 Results Requested By: 8/21/2017

Report To		Subcontract To					Requested Analysis										
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600					<div style="text-align: center;"> <p>WIO#: 30225842</p> <p>30225842</p> </div>										
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				HNO3	Radium-228	Radium-226 & Total Radium	LAB USE ONLY				
1	MW-35-072717	PS	7/27/2017 08:39	60249708001	Water	1					X	X				001	
2	MW-36-072717	PS	7/27/2017 09:25	60249708002	Water	1					X	X				002	
3	DUP-072717	PS	7/27/2017 06:00	60249708003	Water	1					X	X				003	
4																	
5																	
Transfers	Released By	Date/Time	Received By	Date/Time	Comments												
1		7/31/17 1700		8/1/17 0955													
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



Client Name: PACE, KS Project # 30225842

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____
 Tracking #: 6090

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

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

Thermometer Used _____ 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 8/1/17

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: <u>(N)</u>	/			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.	/			15. <u>P142</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				
				Initial when completed: <u>ZH</u> Date/Time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	16.
Trip Blank Present:			/	17.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>ZH</u> Date: <u>8/1/17</u>

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

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

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)
 *PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

ATTACHMENT 1-11
August 2017 Sampling Event
Laboratory Analytical Report

September 06, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60250784

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on August 11, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60250784

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

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: LEC CCR Groundwater

Pace Project No.: 60250784

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60250784001	MW-35-081117	Water	08/11/17 07:58	08/11/17 18:55
60250784002	MW-36-081117	Water	08/11/17 08:52	08/11/17 18:55

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60250784001	MW-35-081117	EPA 200.7	SMW	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	NSM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		60250784002	MW-36-081117	EPA 200.7	SMW
EPA 200.8	JGP			7	PASI-K
EPA 245.1	NSM			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	RMK			1	PASI-PA
SM 2540C	JSS			1	PASI-K
SM 4500-H+B	HMM			1	PASI-K
EPA 300.0	OL			3	PASI-K

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Sample: MW-35-081117		Lab ID: 60250784001		Collected: 08/11/17 07:58	Received: 08/11/17 18:55	Matrix: Water		
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.12	mg/L	0.0050	1	08/16/17 09:53	08/17/17 17:15	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	08/16/17 09:53	08/17/17 17:15	7440-41-7	
Boron, Total Recoverable	1.9	mg/L	0.20	2	08/16/17 09:53	08/22/17 16:02	7440-42-8	
Calcium, Total Recoverable	532	mg/L	0.10	1	08/16/17 09:53	08/17/17 17:15	7440-70-2	M1
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	08/16/17 09:53	08/22/17 16:02	7440-47-3	D3
Lead, Total Recoverable	0.0050J	mg/L	0.010	2	08/16/17 09:53	08/22/17 16:02	7439-92-1	
Lithium	0.43	mg/L	0.010	1	08/16/17 09:53	08/17/17 17:15	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.00013	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7440-36-0	D3
Arsenic, Total Recoverable	0.00092J	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7440-38-2	
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	08/23/17 15:28	08/28/17 16:21	7440-43-9	D3
Cobalt, Total Recoverable	0.0038J	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7440-48-4	
Molybdenum, Total Recoverable	0.0048J	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:21	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	0.000058J	mg/L	0.00020	1	08/29/17 11:40	08/29/17 16:24	7439-97-6	B
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	26800	mg/L	5.0	1		08/14/17 16:46		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		08/15/17 13:16		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	12200	mg/L	2000	2000		08/18/17 19:49	16887-00-6	
Fluoride	1.5	mg/L	0.20	1		08/16/17 16:30	16984-48-8	
Sulfate	656	mg/L	50.0	50		08/16/17 16:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Sample: MW-36-081117	Lab ID: 60250784002	Collected: 08/11/17 08:52	Received: 08/11/17 18:55	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.19	mg/L	0.0050	1	08/16/17 09:53	08/17/17 17:22	7440-39-3	
Beryllium, Total Recoverable	<0.00016	mg/L	0.0010	1	08/16/17 09:53	08/17/17 17:22	7440-41-7	
Boron, Total Recoverable	1.8	mg/L	0.20	2	08/16/17 09:53	08/22/17 16:05	7440-42-8	
Calcium, Total Recoverable	544	mg/L	0.10	1	08/16/17 09:53	08/17/17 17:22	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	08/16/17 09:53	08/22/17 16:05	7440-47-3	D3
Lead, Total Recoverable	<0.0048	mg/L	0.010	2	08/16/17 09:53	08/22/17 16:05	7439-92-1	D3
Lithium	0.41	mg/L	0.010	1	08/16/17 09:53	08/17/17 17:22	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.00013	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7440-36-0	D3
Arsenic, Total Recoverable	0.0020J	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7440-38-2	
Cadmium, Total Recoverable	<0.000089	mg/L	0.0025	5	08/23/17 15:28	08/28/17 16:40	7440-43-9	D3
Cobalt, Total Recoverable	0.0070	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7440-48-4	
Molybdenum, Total Recoverable	0.0072	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	08/23/17 15:28	08/28/17 16:40	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	0.000057J	mg/L	0.00020	1	08/29/17 11:40	08/29/17 16:26	7439-97-6	B
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	26700	mg/L	5.0	1		08/14/17 16:46		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.1	Std. Units	0.10	1		08/15/17 13:16		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	13000	mg/L	2000	2000		08/18/17 20:04	16887-00-6	
Fluoride	1.4	mg/L	0.20	1		08/16/17 17:02	16984-48-8	
Sulfate	513	mg/L	50.0	50		08/16/17 17:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60250784

QC Batch: 491873 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2013080 Matrix: Water
Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	0.000057J	0.00020	08/29/17 16:08	

LABORATORY CONTROL SAMPLE: 2013081

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0051	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013082 2013083

Parameter	Units	60251349001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Mercury	mg/L	ND	.005	.005	.0051	0.0052	102	103	70-130	2	20		

MATRIX SPIKE SAMPLE: 2013084

Parameter	Units	60251349002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0052	104	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 490028 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2005868 Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	08/17/17 17:13	
Beryllium	mg/L	<0.00016	0.0010	08/17/17 17:13	
Boron	mg/L	0.0039J	0.10	08/17/17 17:13	
Calcium	mg/L	<0.036	0.10	08/17/17 17:13	
Chromium	mg/L	<0.00072	0.0050	08/17/17 17:13	
Lead	mg/L	<0.0024	0.0050	08/17/17 17:13	
Lithium	mg/L	<0.0029	0.010	08/17/17 17:13	

LABORATORY CONTROL SAMPLE: 2005869

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	1.0	100	85-115	
Beryllium	mg/L	1	1.0	102	85-115	
Boron	mg/L	1	1.0	101	85-115	
Calcium	mg/L	10	9.7	97	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	1.0	102	85-115	
Lithium	mg/L	1	1.0	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2005870 2005871

Parameter	Units	60250784001		2005871		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Barium	mg/L	0.12	1	1	1.1	1.1	100	103	70-130	2	20	
Beryllium	mg/L	<0.00016	1	1	0.99	1.0	99	101	70-130	2	20	
Boron	mg/L	1.9	1	1	2.9	2.9	98	95	70-130	1	20	
Calcium	mg/L	532	10	10	524	516	-81	-160	70-130	2	20	M1
Chromium	mg/L	<0.0014	1	1	1.0	1.0	101	103	70-130	2	20	
Lead	mg/L	0.0050J	1	1	0.90	0.90	89	90	70-130	0	20	
Lithium	mg/L	0.43	1	1	1.6	1.6	112	113	70-130	1	20	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 491169 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2010358 Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	08/28/17 15:43	
Arsenic	mg/L	<0.000052	0.0010	08/28/17 15:43	
Cadmium	mg/L	<0.000018	0.00050	08/28/17 15:43	
Cobalt	mg/L	<0.000014	0.0010	08/28/17 15:43	
Molybdenum	mg/L	0.000064J	0.0010	08/28/17 15:43	
Selenium	mg/L	<0.000086	0.0010	08/28/17 15:43	
Thallium	mg/L	<0.000036	0.0010	08/28/17 15:43	

LABORATORY CONTROL SAMPLE: 2010359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.041	102	85-115	
Cadmium	mg/L	.04	0.040	99	85-115	
Cobalt	mg/L	.04	0.040	101	85-115	
Molybdenum	mg/L	.04	0.040	101	85-115	
Selenium	mg/L	.04	0.039	99	85-115	
Thallium	mg/L	.04	0.040	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2010360 2010361

Parameter	Units	2010360		2010361		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/L	<0.00013	.04	.04	0.037	0.036	91	89	70-130	3	20
Arsenic	mg/L	0.00092J	.04	.04	0.036	0.036	88	87	70-130	1	20
Cadmium	mg/L	<0.000089	.04	.04	0.032	0.031	80	79	70-130	2	20
Cobalt	mg/L	0.0038J	.04	.04	0.039	0.038	87	86	70-130	1	20
Molybdenum	mg/L	0.0048J	.04	.04	0.048	0.048	109	107	70-130	1	20
Selenium	mg/L	<0.00043	.04	.04	0.030	0.031	75	77	70-130	4	20
Thallium	mg/L	<0.00018	.04	.04	0.033	0.033	83	81	70-130	2	20

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 489748

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2004925

Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/14/17 16:36	

LABORATORY CONTROL SAMPLE: 2004926

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1020	102	80-120	

SAMPLE DUPLICATE: 2004927

Parameter	Units	60250823002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	443	3	10	

SAMPLE DUPLICATE: 2004928

Parameter	Units	60250778001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	17500	17900	3	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 489805 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60250784001, 60250784002

SAMPLE DUPLICATE: 2005118

Parameter	Units	60250784001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 490010

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2005821

Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.10	0.20	08/16/17 14:07	
Sulfate	mg/L	<0.50	1.0	08/16/17 14:07	

LABORATORY CONTROL SAMPLE: 2005822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2005823 2005824

Parameter	Units	60250463002		2005823		2005824		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	ND	5	5	4.9	4.9	91	92	80-120	1	15
Sulfate	mg/L	26.9	10	10	36.7	36.9	98	100	80-120	0	15

MATRIX SPIKE SAMPLE: 2005825

Parameter	Units	60250558001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	500	483	97	80-120	
Sulfate	mg/L	ND	1000	1090	97	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 490466

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 2007839

Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	08/18/17 14:51	

LABORATORY CONTROL SAMPLE: 2007840

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	

MATRIX SPIKE SAMPLE: 2007843

Parameter	Units	60250475001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	16.3	5	22.0	113	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Sample: MW-35-081117 **Lab ID: 60250784001** Collected: 08/11/17 07:58 Received: 08/11/17 18:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	40.2 ± 5.76 (0.546) C:NA T:86%	pCi/L	08/22/17 11:05	13982-63-3	
Radium-228	EPA 904.0	71.0 ± 12.9 (0.655) C:79% T:78%	pCi/L	08/31/17 12:02	15262-20-1	
Total Radium	Total Radium Calculation	111 ± 18.7 (1.20)	pCi/L	09/05/17 12:59	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Sample: MW-36-081117 **Lab ID: 60250784002** Collected: 08/11/17 08:52 Received: 08/11/17 18:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	42.4 ± 6.00 (0.539) C:NA T:89%	pCi/L	08/22/17 11:12	13982-63-3	
Radium-228	EPA 904.0	53.3 ± 9.72 (0.665) C:78% T:77%	pCi/L	08/31/17 12:02	15262-20-1	
Total Radium	Total Radium Calculation	95.7 ± 15.7 (1.20)	pCi/L	09/05/17 12:59	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 268900

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 1323966

Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.180 ± 0.266 (0.572) C:79% T:90%	pCi/L	08/28/17 12:04	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60250784

QC Batch: 268531

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60250784001, 60250784002

METHOD BLANK: 1321780

Matrix: Water

Associated Lab Samples: 60250784001, 60250784002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0754 ± 0.344 (0.700) C:NA T:87%	pCi/L	08/22/17 10:12	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60250784

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60250784

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60250784001	MW-35-081117	EPA 200.7	490028	EPA 200.7	490117
60250784002	MW-36-081117	EPA 200.7	490028	EPA 200.7	490117
60250784001	MW-35-081117	EPA 200.8	491169	EPA 200.8	491198
60250784002	MW-36-081117	EPA 200.8	491169	EPA 200.8	491198
60250784001	MW-35-081117	EPA 245.1	491873	EPA 245.1	492022
60250784002	MW-36-081117	EPA 245.1	491873	EPA 245.1	492022
60250784001	MW-35-081117	EPA 903.1	268531		
60250784002	MW-36-081117	EPA 903.1	268531		
60250784001	MW-35-081117	EPA 904.0	268900		
60250784002	MW-36-081117	EPA 904.0	268900		
60250784001	MW-35-081117	Total Radium Calculation	270486		
60250784002	MW-36-081117	Total Radium Calculation	270486		
60250784001	MW-35-081117	SM 2540C	489748		
60250784002	MW-36-081117	SM 2540C	489748		
60250784001	MW-35-081117	SM 4500-H+B	489805		
60250784002	MW-36-081117	SM 4500-H+B	489805		
60250784001	MW-35-081117	EPA 300.0	490010		
60250784001	MW-35-081117	EPA 300.0	490466		
60250784002	MW-36-081117	EPA 300.0	490010		
60250784002	MW-36-081117	EPA 300.0	490466		

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Sample Condition Upon Receipt

WO# : 60250784

60250784

Client Name: Westar

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

Tracking #: _____ 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-00 / T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 4.3 Corr. Factor CF 0.0 CF +0.3 Corrected 4.3

HW
 Date and initials of person examining contents: 8/11/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>8/11/17</u> <u>pl</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

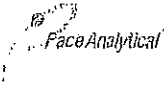
Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature]

Date: 8/14/17

Sample Condition Upon Receipt Pittsburgh



Client Name: PACE, KS

Project # 30227234

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728565957794

Label: <u>CO</u>
LIMS Login: <u>AMW</u>

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

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

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C
Temp should be above freezing to 6°C

Date and Initials of person examining contents: ZH 8/15/12

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

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ Contacted By: _____
 Comments/ Resolution: Received 2 containers for each sample

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.

September 26, 2017

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC CCR Groundwater
Pace Project No.: 60251805

Dear Brandon Griffin:

Enclosed are the analytical results for sample(s) received by the laboratory on August 25, 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,



Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: LEC CCR Groundwater

Pace Project No.: 60251805

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

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: LEC CCR Groundwater

Pace Project No.: 60251805

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60251805001	MW-35-082517	Water	08/25/17 09:05	08/25/17 15:35
60251805002	MW-36-082517	Water	08/25/17 10:28	08/25/17 15:35
60251805003	DUP-082517	Water	08/25/17 06:00	08/25/17 15:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60251805001	MW-35-082517	EPA 200.7	TDS	7	PASI-K
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		60251805002	MW-36-082517	EPA 200.7	TDS
EPA 200.8	JGP			7	PASI-K
EPA 245.1	SMW			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	JSS			1	PASI-K
SM 4500-H+B	HMM			1	PASI-K
EPA 300.0	OL			3	PASI-K
60251805003	DUP-082517			EPA 200.7	TDS
		EPA 200.8	JGP	7	PASI-K
		EPA 245.1	SMW	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: MW-35-082517	Lab ID: 60251805001	Collected: 08/25/17 09:05	Received: 08/25/17 15:35	Matrix: Water				
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.12	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:08	7440-39-3	
Beryllium, Total Recoverable	<0.00033	mg/L	0.0020	2	08/29/17 12:19	08/30/17 16:15	7440-41-7	D3
Boron, Total Recoverable	1.8	mg/L	0.20	2	08/29/17 12:19	08/30/17 16:15	7440-42-8	
Calcium, Total Recoverable	537	mg/L	0.10	1	08/29/17 12:19	08/30/17 14:08	7440-70-2	M1
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	08/29/17 12:19	08/30/17 16:15	7440-47-3	D3
Lead, Total Recoverable	0.0028J	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:08	7439-92-1	
Lithium	0.54	mg/L	0.010	1	08/29/17 12:19	08/30/17 14:08	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	<0.00013	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7440-36-0	D3
Arsenic, Total Recoverable	0.00096J	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7440-38-2	
Cadmium, Total Recoverable	<0.00089	mg/L	0.0025	5	08/29/17 12:19	09/05/17 12:15	7440-43-9	D3
Cobalt, Total Recoverable	0.0038J	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7440-48-4	
Molybdenum, Total Recoverable	0.0045J	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7439-98-7	
Selenium, Total Recoverable	<0.00043	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7782-49-2	D3
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:15	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	09/13/17 16:05	09/14/17 12:21	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	23900	mg/L	5.0	1		08/29/17 09:38		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		08/30/17 09:35		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14900	mg/L	1000	1000		09/17/17 10:47	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		09/15/17 10:42	16984-48-8	
Sulfate	627	mg/L	50.0	50		09/17/17 08:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: MW-36-082517		Lab ID: 60251805002	Collected: 08/25/17 10:28	Received: 08/25/17 15:35	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.21	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:19	7440-39-3	
Beryllium, Total Recoverable	<0.00033	mg/L	0.0020	2	08/29/17 12:19	08/30/17 16:23	7440-41-7	D3
Boron, Total Recoverable	1.7	mg/L	0.20	2	08/29/17 12:19	08/30/17 16:23	7440-42-8	
Calcium, Total Recoverable	562	mg/L	0.10	1	08/29/17 12:19	08/30/17 14:19	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	08/29/17 12:19	08/30/17 16:23	7440-47-3	D3
Lead, Total Recoverable	<0.0024	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:19	7439-92-1	
Lithium	0.50	mg/L	0.010	1	08/29/17 12:19	08/30/17 14:19	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.00011J	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:01	7440-36-0	M1
Arsenic, Total Recoverable	0.0022	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:01	7440-38-2	M1
Cadmium, Total Recoverable	<0.00018	mg/L	0.00050	1	08/29/17 12:19	09/05/17 13:01	7440-43-9	M1
Cobalt, Total Recoverable	0.0072	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:01	7440-48-4	M1
Molybdenum, Total Recoverable	0.0074	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:01	7439-98-7	
Selenium, Total Recoverable	<0.000086	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:01	7782-49-2	M1
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:22	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	09/13/17 16:05	09/14/17 12:23	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	25700	mg/L	5.0	1		08/29/17 09:38		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		08/30/17 09:36		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	15200	mg/L	1000	1000		09/17/17 12:19	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		09/15/17 11:57	16984-48-8	
Sulfate	510	mg/L	50.0	50		09/17/17 12:04	14808-79-8	

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ANALYTICAL RESULTS

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: DUP-082517		Lab ID: 60251805003	Collected: 08/25/17 06:00	Received: 08/25/17 15:35	Matrix: Water			
Parameters	Results	Units	PQL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7						
Barium, Total Recoverable	0.13	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:23	7440-39-3	
Beryllium, Total Recoverable	<0.00033	mg/L	0.0020	2	08/29/17 12:19	08/31/17 15:38	7440-41-7	D3
Boron, Total Recoverable	1.8	mg/L	0.20	2	08/29/17 12:19	08/31/17 15:38	7440-42-8	
Calcium, Total Recoverable	528	mg/L	0.10	1	08/29/17 12:19	08/30/17 14:23	7440-70-2	
Chromium, Total Recoverable	<0.0014	mg/L	0.010	2	08/29/17 12:19	08/31/17 15:38	7440-47-3	D3
Lead, Total Recoverable	0.0028J	mg/L	0.0050	1	08/29/17 12:19	08/30/17 14:23	7439-92-1	
Lithium	0.48	mg/L	0.010	1	08/29/17 12:19	08/30/17 14:23	7439-93-2	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Antimony, Total Recoverable	0.000065J	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:22	7440-36-0	
Arsenic, Total Recoverable	0.00077J	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:22	7440-38-2	
Cadmium, Total Recoverable	<0.000018	mg/L	0.00050	1	08/29/17 12:19	09/05/17 13:22	7440-43-9	
Cobalt, Total Recoverable	0.0032	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:22	7440-48-4	
Molybdenum, Total Recoverable	0.0044	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:22	7439-98-7	
Selenium, Total Recoverable	<0.000086	mg/L	0.0010	1	08/29/17 12:19	09/05/17 13:22	7782-49-2	
Thallium, Total Recoverable	<0.00018	mg/L	0.0050	5	08/29/17 12:19	09/05/17 12:41	7440-28-0	D3
245.1 Mercury		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	<0.000024	mg/L	0.00020	1	09/13/17 16:05	09/14/17 12:25	7439-97-6	
2540C Total Dissolved Solids		Analytical Method: SM 2540C						
Total Dissolved Solids	24900	mg/L	5.0	1		08/29/17 09:38		
4500H+ pH, Electrometric		Analytical Method: SM 4500-H+B						
pH at 25 Degrees C	7.2	Std. Units	0.10	1		08/30/17 09:38		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0						
Chloride	14600	mg/L	1000	1000		09/17/17 12:50	16887-00-6	
Fluoride	<0.10	mg/L	0.20	1		09/15/17 12:41	16984-48-8	
Sulfate	596	mg/L	50.0	50		09/17/17 12:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 494071

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury

Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2021073

Matrix: Water

Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.000024	0.00020	09/14/17 12:07	

LABORATORY CONTROL SAMPLE: 2021074

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	.005	0.0051	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2021075 2021076

Parameter	Units	60251633001		2021075		2021076		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.					
Mercury	mg/L	<0.00020	.005	.005	.005	0.0042	0.0044	85	88	70-130	4	20

MATRIX SPIKE SAMPLE: 2021077

Parameter	Units	60252592002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	.005	0.0049	98	70-130	

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

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 491981 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2013430 Matrix: Water

Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	mg/L	<0.00091	0.0050	08/30/17 14:00	
Beryllium	mg/L	<0.00016	0.0010	08/30/17 14:00	
Boron	mg/L	<0.0035	0.10	08/30/17 14:00	
Calcium	mg/L	<0.036	0.10	08/30/17 14:00	
Chromium	mg/L	<0.00072	0.0050	08/30/17 14:00	
Lead	mg/L	<0.0024	0.0050	08/30/17 14:00	
Lithium	mg/L	<0.0029	0.010	08/30/17 14:00	

LABORATORY CONTROL SAMPLE: 2013431

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	mg/L	1	0.99	99	85-115	
Beryllium	mg/L	1	0.99	99	85-115	
Boron	mg/L	1	0.96	96	85-115	
Calcium	mg/L	10	9.6	96	85-115	
Chromium	mg/L	1	0.98	98	85-115	
Lead	mg/L	1	1.0	103	85-115	
Lithium	mg/L	1	0.99	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013432 2013433

Parameter	Units	2013432		2013433		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Barium	mg/L	0.12	1	1	1.2	1.2	106	105	70-130	1	20	
Beryllium	mg/L	<0.00033	1	1	1.0	1.0	104	102	70-130	2	20	
Boron	mg/L	1.8	1	1	2.9	2.8	109	98	70-130	4	20	
Calcium	mg/L	537	10	10	539	528	24	-87	70-130	2	20	M1
Chromium	mg/L	<0.0014	1	1	1.0	0.98	103	98	70-130	5	20	
Lead	mg/L	0.0028J	1	1	0.89	0.91	89	91	70-130	2	20	
Lithium	mg/L	0.54	1	1	1.8	1.7	124	119	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater
Pace Project No.: 60251805

QC Batch: 491980 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2013424 Matrix: Water
Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	mg/L	<0.000026	0.0010	09/05/17 11:42	
Arsenic	mg/L	<0.000052	0.0010	09/05/17 11:42	
Cadmium	mg/L	<0.000018	0.00050	09/05/17 11:42	
Cobalt	mg/L	<0.000014	0.0010	09/05/17 11:42	
Molybdenum	mg/L	<0.000058	0.0010	09/05/17 11:42	
Selenium	mg/L	<0.000086	0.0010	09/05/17 11:42	
Thallium	mg/L	<0.000036	0.0010	09/05/17 11:42	

LABORATORY CONTROL SAMPLE: 2013425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	.04	0.040	100	85-115	
Arsenic	mg/L	.04	0.041	102	85-115	
Cadmium	mg/L	.04	0.040	101	85-115	
Cobalt	mg/L	.04	0.040	101	85-115	
Molybdenum	mg/L	.04	0.041	102	85-115	
Selenium	mg/L	.04	0.040	101	85-115	
Thallium	mg/L	.04	0.039	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2013426 2013427

Parameter	Units	2013426		2013427		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	mg/L	0.00011J	.04	.04	0.027	0.027	67	67	70-130	0	20 M1
Arsenic	mg/L	0.0022	.04	.04	0.027	0.027	63	63	70-130	1	20 M1
Cadmium	mg/L	<0.000018	.04	.04	0.022	0.022	55	55	70-130	0	20 M1
Cobalt	mg/L	0.0072	.04	.04	0.034	0.034	67	67	70-130	0	20 M1
Molybdenum	mg/L	0.0074	.04	.04	0.042	0.041	86	84	70-130	2	20
Selenium	mg/L	<0.000086	.04	.04	0.022	0.022	55	55	70-130	1	20 M1
Thallium	mg/L	<0.00018	.04	.04	0.035	0.035	87	88	70-130	1	20

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 491906

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2013226

Matrix: Water

Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	08/29/17 09:32	

LABORATORY CONTROL SAMPLE: 2013227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	977	98	80-120	

SAMPLE DUPLICATE: 2013228

Parameter	Units	60251761003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	468	467	0	10	

SAMPLE DUPLICATE: 2013229

Parameter	Units	60251856007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	159	162	1	10	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 492058 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60251805001, 60251805002, 60251805003

SAMPLE DUPLICATE: 2013862

Parameter	Units	60251761001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.6	5.6	0	5	H6

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 494285 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2022059 Matrix: Water

Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.10	0.20	09/15/17 08:24	

LABORATORY CONTROL SAMPLE: 2022060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.3	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2022061 2022062

Parameter	Units	60252473001		2022061		2022062		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Fluoride	mg/L	ND	125	125	119	119	95	95	80-120	0	15

MATRIX SPIKE SAMPLE: 2022063

Parameter	Units	60252473002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	125	124	99	80-120	

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QUALITY CONTROL DATA

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch: 494446

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60251805001, 60251805002, 60251805003

METHOD BLANK: 2022928

Matrix: Water

Associated Lab Samples: 60251805001, 60251805002, 60251805003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	09/17/17 07:22	
Sulfate	mg/L	<0.50	1.0	09/17/17 07:22	

LABORATORY CONTROL SAMPLE: 2022929

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2022930 2022931

Parameter	Units	60251805001		2022930		2022931		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	14900	5000	20700	20500	116	112	80-120	1	15	
Sulfate	mg/L	627	250	869	864	97	95	80-120	1	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: MW-35-082517 **Lab ID: 60251805001** Collected: 08/25/17 09:05 Received: 08/25/17 15:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	38.0 ± 5.49 (0.865) C:NA T:89%	pCi/L	09/25/17 11:24	13982-63-3	
Radium-228	EPA 904.0	70.7 ± 12.8 (0.818) C:72% T:86%	pCi/L	09/12/17 11:22	15262-20-1	
Total Radium	Total Radium Calculation	109 ± 18.3 (1.68)	pCi/L	09/26/17 09:43	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: MW-36-082517 **Lab ID: 60251805002** Collected: 08/25/17 10:28 Received: 08/25/17 15:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	37.4 ± 5.50 (0.951) C:NA T:84%	pCi/L	09/25/17 11:24	13982-63-3	
Radium-228	EPA 904.0	55.4 ± 10.1 (0.682) C:68% T:95%	pCi/L	09/12/17 11:22	15262-20-1	
Total Radium	Total Radium Calculation	92.8 ± 15.6 (1.63)	pCi/L	09/26/17 09:43	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Sample: DUP-082517 **Lab ID: 60251805003** Collected: 08/25/17 06:00 Received: 08/25/17 15:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	39.4 ± 5.66 (1.02) C:NA T:86%	pCi/L	09/25/17 11:24	13982-63-3	
Radium-228	EPA 904.0	78.8 ± 14.3 (0.845) C:67% T:73%	pCi/L	09/12/17 11:22	15262-20-1	
Total Radium	Total Radium Calculation	118 ± 20.0 (0.845)	pCi/L	09/26/17 09:43	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch:	272333	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60251805001, 60251805002, 60251805003		

METHOD BLANK:	1339817	Matrix:	Water
Associated Lab Samples:	60251805001, 60251805002, 60251805003		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.299 ± 0.360 (0.550) C:NA T:88%	pCi/L	09/25/17 11:06	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: LEC CCR Groundwater

Pace Project No.: 60251805

QC Batch:	270011	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60251805001, 60251805002, 60251805003		

METHOD BLANK:	1328713	Matrix:	Water
Associated Lab Samples:	60251805001, 60251805002, 60251805003		

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	

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QUALIFIERS

Project: LEC CCR Groundwater

Pace Project No.: 60251805

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-K Pace Analytical Services - Kansas City

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC CCR Groundwater

Pace Project No.: 60251805

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60251805001	MW-35-082517	EPA 200.7	491981	EPA 200.7	492041
60251805002	MW-36-082517	EPA 200.7	491981	EPA 200.7	492041
60251805003	DUP-082517	EPA 200.7	491981	EPA 200.7	492041
60251805001	MW-35-082517	EPA 200.8	491980	EPA 200.8	492040
60251805002	MW-36-082517	EPA 200.8	491980	EPA 200.8	492040
60251805003	DUP-082517	EPA 200.8	491980	EPA 200.8	492040
60251805001	MW-35-082517	EPA 245.1	494071	EPA 245.1	494160
60251805002	MW-36-082517	EPA 245.1	494071	EPA 245.1	494160
60251805003	DUP-082517	EPA 245.1	494071	EPA 245.1	494160
60251805001	MW-35-082517	EPA 903.1	272333		
60251805002	MW-36-082517	EPA 903.1	272333		
60251805003	DUP-082517	EPA 903.1	272333		
60251805001	MW-35-082517	EPA 904.0	270011		
60251805002	MW-36-082517	EPA 904.0	270011		
60251805003	DUP-082517	EPA 904.0	270011		
60251805001	MW-35-082517	Total Radium Calculation	273102		
60251805002	MW-36-082517	Total Radium Calculation	273102		
60251805003	DUP-082517	Total Radium Calculation	273102		
60251805001	MW-35-082517	SM 2540C	491906		
60251805002	MW-36-082517	SM 2540C	491906		
60251805003	DUP-082517	SM 2540C	491906		
60251805001	MW-35-082517	SM 4500-H+B	492058		
60251805002	MW-36-082517	SM 4500-H+B	492058		
60251805003	DUP-082517	SM 4500-H+B	492058		
60251805001	MW-35-082517	EPA 300.0	494285		
60251805001	MW-35-082517	EPA 300.0	494446		
60251805002	MW-36-082517	EPA 300.0	494285		
60251805002	MW-36-082517	EPA 300.0	494446		
60251805003	DUP-082517	EPA 300.0	494285		
60251805003	DUP-082517	EPA 300.0	494446		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60251805



Client Name: Westar

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

Tracking #: _____ 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 4.0 Corr. Factor CF 0.0 / CF +0.3 Corrected 4.0

Date and initials of person examining contents: HU 8-25-17

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Amw

Date: 8/28/17

Chain of Custody



Workorder: 60251805 Workorder Name: LEC CCR Groundwater Owner Received Date: 8/25/2017 Results Requested By: 9/19/2017

Report To		Subcontract To					Requested Analysis											
Heather Wilson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1407		Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600																
						Radium-228 Radium-226 & Total Radium												
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					LAB USE ONLY							
						HNO3												
1	MW-35-082517	PS	8/25/2017 09:05	60251805001	Water	2							X	X				001
2	MW-36-082517	PS	8/25/2017 10:28	60251805002	Water	2							X	X				002
3	DUP-082517	PS	8/25/2017 06:00	60251805003	Water	2							X	X				003
4																		
5																		
Transfers													Comments					
Released By	Date/Time	Received By	Date/Time															
<i>[Signature]</i>	8/28/17 12:00	<i>[Signature]</i>	8/29/17 10:30															
Cooler Temperature on Receipt		Custody Seal		Received on Ice		Samples Intact												
N/A °C		Y or N		Y or N		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

30228477



Client Name: PACE, KS

Project # _____

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Tracking #: 728565962690

Label <u>AM</u>
LIMS Login <u>AM</u>

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

Thermometer Used N/A ²⁴ Type of Ice: Wet Blue None

Cooler Temperature Observed Temp N/A °C Correction Factor: 0.0 °C Final Temp: N/A °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:	/			5.
-Includes date/time/ID Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	/			6.
Short Hold Time Analysis (<72hr remaining):		/		7.
Rush Turn Around Time Requested:		/		8.
Sufficient Volume:	/			9.
Correct Containers Used:	/			10.
-Pace Containers Used:	/			
Containers Intact:	/			11.
Orthophosphate field filtered			/	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			/	13.
Organic Samples checked for dechlorination:			/	14.
Filtered volume received for Dissolved tests			/	15.
All containers have been checked for preservation.	/			16. <u>PH 42</u>
All containers needing preservation are found to be in compliance with EPA recommendation.	/			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed: <u>ZH</u> Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			/	17.
Trip Blank Present:			/	18.
Trip Blank Custody Seals Present			/	
Rad Aqueous Samples Screened > 0.5 mrem/hr		/		Initial when completed: <u>ZH</u> Date: <u>8/29/17</u>

Client Notification/ Resolution:

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

Comments/ Resolution: _____

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







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

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

ATTACHMENT 2
Groundwater Potentiometric Maps

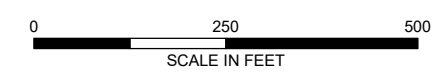


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), AUGUST 2016
- 815.26**
-  MONITORING WELL
-  WATER QUALITY ONLY
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  847 LANDFILL
-  FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 16 AUGUST 2016.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 16 AUGUST 2016 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
AUGUST 16, 2016



OCTOBER 2022

FIGURE 2

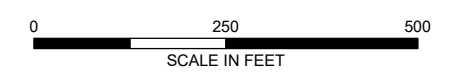


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), SEPTEMBER 2016
- 815.26** 815.26
- MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 19 SEPTEMBER 2016.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 19 SEPTEMBER 2016 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
SEPTEMBER 19, 2016



OCTOBER 2022

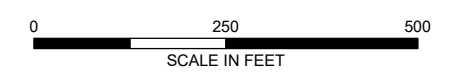


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), OCTOBER 2016
- 815.26**
- MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 31 OCTOBER 2016.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 31 OCTOBER 2016 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
OCTOBER 31, 2016



OCTOBER 2022

FIGURE 4

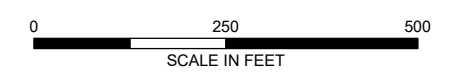


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), DECEMBER 2016
- 815.26** MONITORING WELL
- MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 12 DECEMBER 2016.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 12 DECEMBER 2016 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
DECEMBER 12, 2016



OCTOBER 2022

FIGURE 5

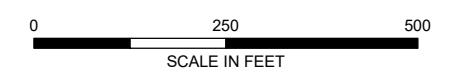


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), FEBRUARY 2017
- 815.26** 815.26
- MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 06 FEBRUARY 2017.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 06 FEBRUARY 2017 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
FEBRUARY 6, 2017



OCTOBER 2022

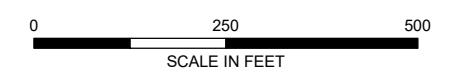


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), APRIL 2017
- 815.26** MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 04 APRIL 2017.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 04 APRIL 2017 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
APRIL 4, 2017



OCTOBER 2022

FIGURE 7

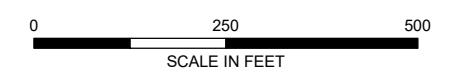


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MAY 2017
- 815.26** 815.26
- MONITORING WELL
- WATER QUALITY ONLY
- ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
- GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
- 847 LANDFILL
- FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 22 MAY 2017.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 22 MAY 2017 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS







847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MAY 22, 2017



OCTOBER 2022

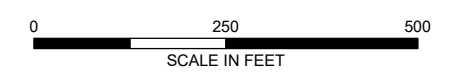


LEGEND

- MW-L** WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), JUNE 2017
- 815.26**
-  MONITORING WELL
-  WATER QUALITY ONLY
-  ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
-  GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
-  847 LANDFILL
-  FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 26 JUNE 2017.
3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.
4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 26 JUNE 2017 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.
5. AERIAL IMAGERY SOURCE: ESRI, 17 APRIL 2018



EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
JUNE 26, 2017



OCTOBER 2022