HALEY ALDRICH

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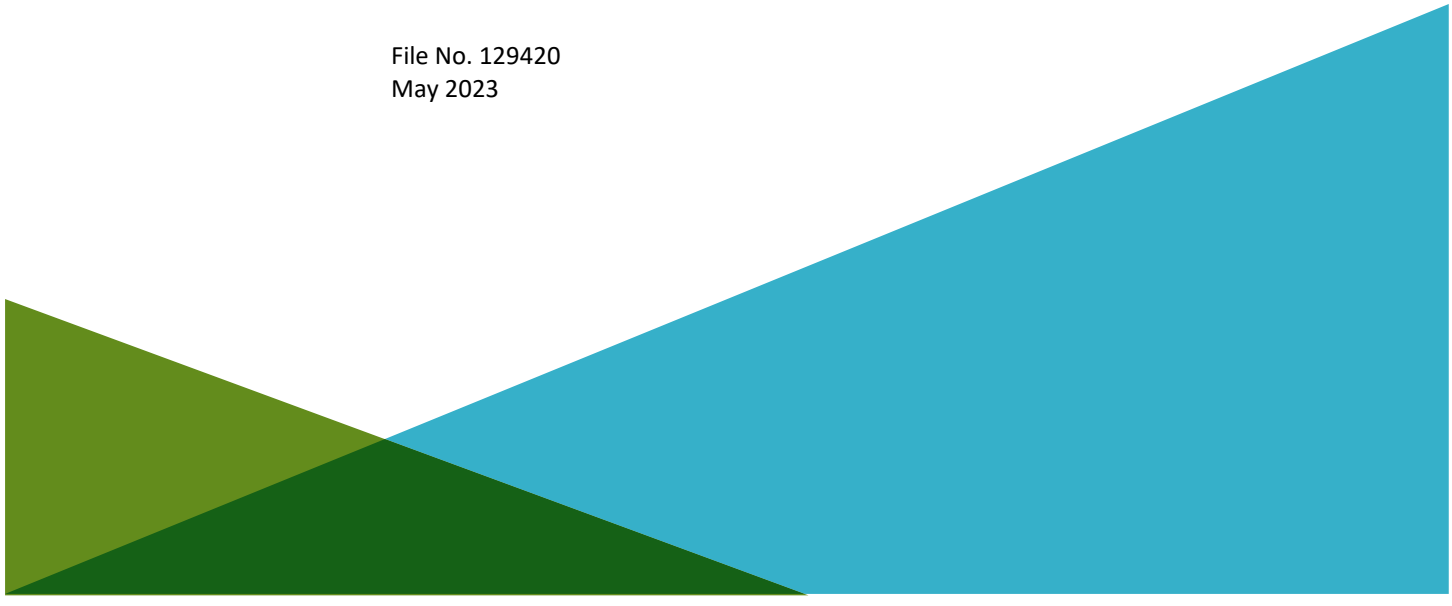
2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ADDENDUM SEDIMENTATION POND A.B. BROWN GENERATING STATION POSEY COUNTY, INDIANA

by
Haley & Aldrich, Inc.
Greenville, South Carolina

for
Southern Indiana Gas and Electric Company
Evansville, Indiana

File No. 129420
May 2023



HALEY & ALDRICH, INC.
400 Augusta Street
Suite 100
Greenville, SC 29601
864.214.8750

23 May 2023
File No. 129420

SUBJECT: 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum
Southern Indiana Gas and Electric Company
Sedimentation Pond
A.B. Brown Generating Station; Posey County, Indiana

The Sedimentation Pond at A.B. Brown Generating Station is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through § 257.98 (Rule). An *Annual Groundwater Monitoring and Corrective Action Report* (Annual Groundwater Report) documenting the activities in 2019 for the Sedimentation Pond was completed and placed in the facilities operating record on 31 January 2020, as required by the Rule. The Annual Groundwater Report contained the specific information listed in § 257.90(e).

This addendum has been prepared to supplement the operating record in recognition of comments issued by the United States Environmental Protection Agency (U.S. EPA) on 11 January 2022, to various utilities regarding their respective Part A extension applications, and U.S. EPA's "proposed finding that GWMCA reports are incomplete and lack clarity of visual representation of data" in the proposed conditional approval for the A.B. Brown Generating Station that was released on 5 October 2022. Those comments, proposed findings, and U.S. EPA clarifications were understood to be U.S. EPA's expectations regarding the contents of the facility's Annual Groundwater Report. In addition to the information listed in § 257.90(e), the U.S. EPA indicated in their comments that annual reports should contain:

- water level gauging data for each sampling event, including groundwater elevation data, a determination of groundwater flow direction(s) and rate(s), and updated potentiometric surface map(s);
- laboratory analytical reports to verify that groundwater sampling and analysis requirements outlined in § 257.93 are being met; and finally,
- statistical analyses, including detailed discussion of the statistical analyses (e.g., statistical method applied, confidence levels, and normality test results).

While this information is not specifically referred to in the in 257.90(e) of the Rule for inclusion in the annual reports, it has been routinely collected and maintained in Southern Indiana Gas and Electric Company's files, and is being provided in the attachments to this addendum as follows:

Attachment 1 – Groundwater Gauging Data

- Summary of groundwater gauging data

Attachment 2 – Updated Potentiometric Surface Map Containing Most Recent Groundwater Elevation Data

- Water table configuration map – June 2019
- Water table configuration map – October 2019

Water table maps include groundwater flow direction arrows and groundwater velocity calculations.

Attachment 3 – Laboratory Analytical Reports

- Laboratory data packages

Includes supporting information, such as, case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation.

Attachment 4 – Statistical Analyses

- Statistical evaluation of the June and August 2018 *Groundwater Assessment Monitoring*
- Statistical evaluation of the May 2019 *Semi-annual Groundwater Assessment*

Includes a discussion of the statistical analysis utilized along with a table summarizing the statistical outputs (e.g., frequency of detection, maximum detection, variance, standard deviation, coefficient of variance, outlier tests, trends, upper and lower confidence limits, and comparison against Groundwater Protection Standards), and supporting backup.

G:\129420 Vectren\Deliverables\AB_Brown\Annual Report\2020\Sedimentation Pond\Addendum for EPA\2023-0523_ABB Sedimentation Pond 2019 Annual Report Addendum_F.docx

ATTACHMENT 1

Groundwater Gauging Data

VECTREN - AB BROWN STATION

Groundwater Sampling Event

Gauging Date: June 14, 2019

ATC Project No. 170LF00738

WELL ID	DTW FROM TOC
CCR-AP-1R	14.64
CCR-AP-2R	36.10
CCR-AP-2I	25.95
CCR-AP-3R	33.77
CCR-AP-3I	22.61
CCR-AP-4R	30.84
CCR-AP-5	34.93
CCR-AP-6	13.25
CCR-AP-7R	32.41
CCR-AP-8	4.02
CCR-AP-9	10.81
CCR-AP-10	35.05
CCR-LF-1	6.99
CCR-LF-2	24.97
CCR-LF-3	27.37
CCR-LF-4	45.28
CCR-LF-5	18.72
CCR-LF-6	7.88
CCR-SP-1	10.23
CCR-SP-2	12.99
CCR-SP-3	5.89
CCR-BK-1R	dry to top of pump
CCR-BK-2	12.98

DTW= Depth to Water

TOC= Top of Casing

VECTREN - AB BROWN STATION
CCR Groundwater Sampling Event
Gauging Dates: October 14 and October 17, 2019*
ATC Project No. 170LF00739

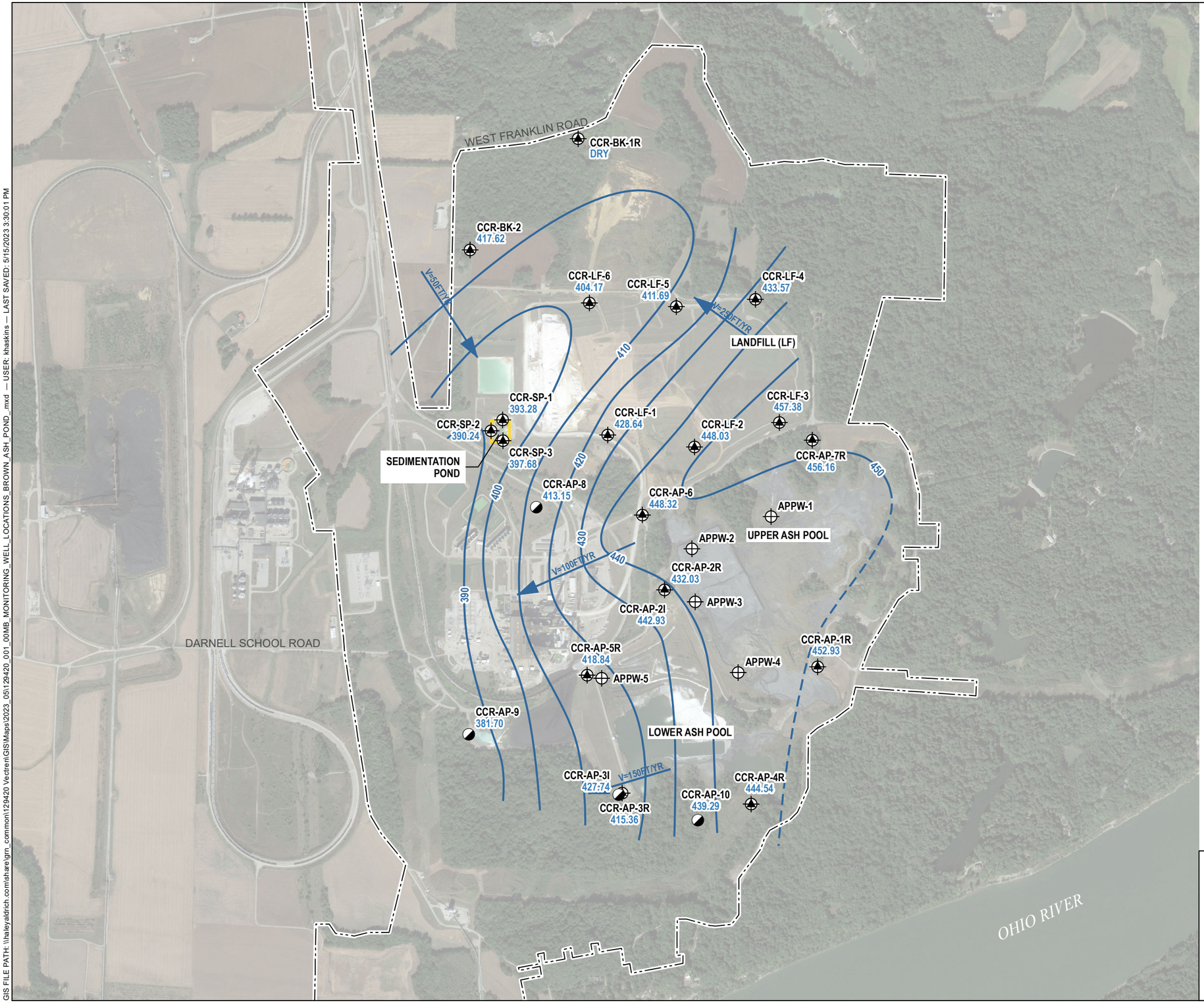
WELL ID	DATE	TIME	DTW FROM TOC
Ash Pond Wells			
CCR-AP-1R	10/14/2019	12:45	18.42
CCR-AP-2R	10/14/2019	17:10	42.11
CCR-AP-2I	10/14/2019	17:05	39.30
CCR-AP-3R	10/14/2019	16:25	39.30
CCR-AP-3I	10/14/2019	16:30	23.33
CCR-AP-4R	10/14/2019	16:00	35.62
CCR-AP-5	10/14/2019	16:35	37.80
CCR-AP-6	10/14/2019	14:10	16.87
CCR-AP-7R	10/14/2019	14:20	35.15
CCR-AP-8	10/14/2019	14:30	5.86
CCR-AP-9	10/14/2019	13:45	8.82
CCR-AP-10	10/14/2019	16:10	38.68
Landfill Wells			
CCR-LF-1	10/14/2019	10:25	9.97
CCR-LF-2	10/14/2019	10:30	26.87
CCR-LF-3	10/14/2019	10:35	29.00
CCR-LF-4	10/14/2019	14:00	47.30
CCR-LF-5	10/14/2019	10:00	22.09
CCR-LF-6	10/14/2019	11:35	8.03
Sedimentation Pond Wells			
CCR-SP-1	10/14/2019	10:55	14.66
CCR-SP-2	10/17/2019	9:05	16.00
CCR-SP-3	10/14/2019	11:00	14.98
Background Wells			
CCR-BK-1R	10/14/2019	13:16	60.50
CCR-BK-2	10/14/2019	12:23	23.40

DTW= Depth to Water
TOC= Top of Casing

*CCR-SP-2 was not located until October 17, 2019; it had been covered by washout from adjacent road.

ATTACHMENT 2

Updated Potentiometric Surface Map Containing Most Recent Groundwater Elevation Data



LEGEND

- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- PROPERTY BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. CCR REGULATED UNITS INCLUDE THE ASH POND, LANDFILL, AND SEDIMENTATION POND.
3. GROUNDWATER ELEVATIONS WERE MEASURED 14 JUNE 2019.
4. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING

$$V = \frac{k(i)}{n_e}$$

WHERE:
V = GROUNDWATER FLOW VELOCITY (FT/YR)
k = HORIZONTAL HYDRAULIC CONDUCTIVITY (FT/DAY)
i = HORIZONTAL GROUNDWATER GRADIENT (FT/FT)
n_e = ASSUMED EFFECTIVE POROSITY

5. AERIAL IMAGERY SOURCE: GOOGLE, 2019

N

0 1,100 2,200
SCALE IN FEET

HALEY ALDRICH

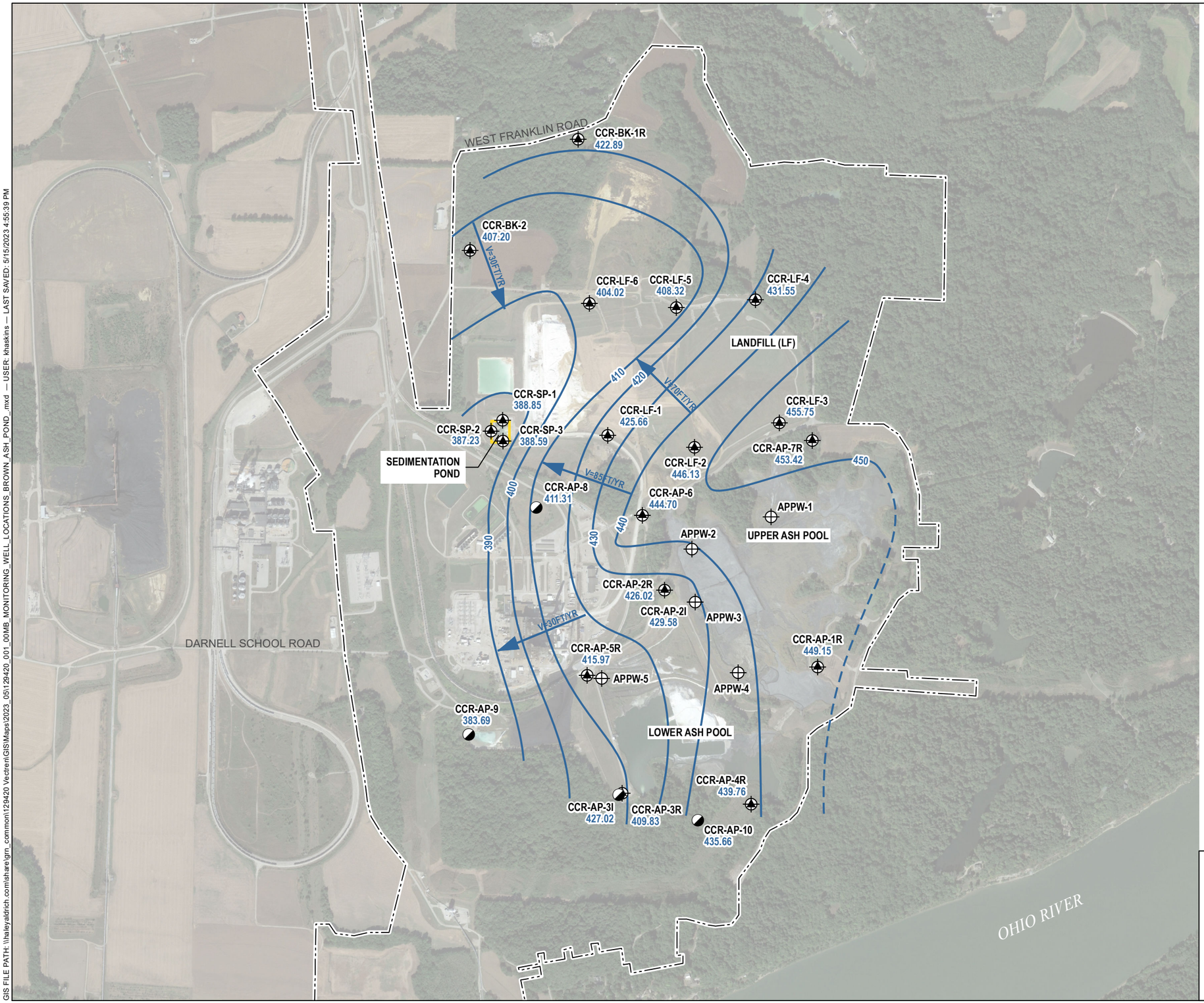
SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA

SHALLOW GROUNDWATER ELEVATION CONTOURS - JUNE 2019

JULY 2019

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\gm_common\129420 Vectren\GIS\Maps\2023_05\129420_001_00MB_MONITORING_WELL_LOCATIONS_BROWN_ASH_POND_.mxd — USER: khaskins — LAST SAVED: 5/15/2023 3:30:01 PM



LEGEND

- CCR MONITORING WELL
- NATURE AND EXTENT MONITORING WELL
- CCR PIEZOMETER WELL
- GROUNDWATER ELEVATION CONTOUR, 10-FT INTERVAL, DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- APPROXIMATE UNIT BOUNDARY
- PROPERTY BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. CCR REGULATED UNITS INCLUDE THE ASH POND, LANDFILL, AND SEDIMENTATION POND.
3. GROUNDWATER ELEVATIONS WERE MEASURED 14 OCTOBER 2019.
4. APPROXIMATE GROUNDWATER FLOW RATE CALCULATED USING

$$V = \frac{k(i)}{n_e}$$

WHERE:
V = GROUNDWATER FLOW VELOCITY (FT/YR)
k = HORIZONTAL HYDRAULIC CONDUCTIVITY (FT/DAY)
i = HORIZONTAL GROUNDWATER GRADIENT (FT/FT)
n_e = ASSUMED EFFECTIVE POROSITY

5. AERIAL IMAGERY SOURCE: GOOGLE, 2019

N

0 1,100 2,200
SCALE IN FEET

HALEY ALDRICH

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
A.B. BROWN GENERATING STATION
MOUNT VERNON, INDIANA

SHALLOW GROUNDWATER ELEVATION CONTOURS - OCTOBER 2019

NOVEMBER 2019

FIGURE 2

ATTACHMENT 3

Laboratory Analytical Reports

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-90606-1
Client Project/Site: CCR Groundwater Monitoring AB Brown

For:
Vectren Corporation
PO BOX 209
Evansville, Indiana 47702

Attn: Accounts Payable

Veronica Bortot

Authorized for release by:
8/14/2019 2:43:51 PM

Veronica Bortot, Senior Project Manager
(412)963-2435
veronica.bortot@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-90606-1

Laboratory: Eurofins TestAmerica, Pittsburgh

Narrative

Job Narrative
180-90606-1

Comments
No additional comments.

Receipt
The samples were received on 5/29/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 1.8º C, 2.1º C, 2.3º C, 2.5º C and 2.8º C.

Anions
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method(s) 6020A: The following sample was diluted to bring the concentration of boron within the calibration range: CCR-AP-2R (180-90606-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

RAD
Method(s) 903.0, 9315: Ra-226 Prep Batch 160-431020

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
CCR-SP-1 (180-90606-1), CCR-SP-2 (180-90606-2), CCR-SP-3 (180-90606-3), (LCS 160-431020/1-A), (MB 160-431020/23-A), (600-184470-C-19-A), (600-184470-D-19-A MS) and (600-184470-C-19-B MSD)

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-431125

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
CCR-AP-1R (180-90606-4), CCR-AP-2R (180-90606-5), BLIND DUPLICATE 3 (180-90606-6), FIIELD BLANK 3 (180-90606-7), (LCS 160-431125/1-A), (MB 160-431125/23-A), (180-90609-B-7-A) and (180-90609-I-7-A DU)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-431030

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
CCR-SP-1 (180-90606-1), CCR-SP-2 (180-90606-2), CCR-SP-3 (180-90606-3), (LCS 160-431030/1-A), (MB 160-431030/23-A), (600-184470-C-19-C), (600-184470-D-19-B MS) and (600-184470-C-19-D MSD)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-431128

Job ID: 180-90606-1 (Continued)

Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
CCR-AP-1R (180-90606-4), CCR-AP-2R (180-90606-5), BLIND DUPLICATE 3 (180-90606-6), FIIELD BLANK 3 (180-90606-7), (LCS 160-431128/1-A), (MB 160-431128/23-A), (180-90609-B-7-B) and (180-90609-I-7-B DU)

Definitions/Glossary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arkansas DEQ	State Program	6	88-0690	06-27-20
California	State		2891	04-30-20
California	State Program	9	2891	04-30-20
Connecticut	State		PH-0688	09-30-20
Connecticut	State Program	1	PH-0688	09-30-20
Florida	NELAP	4	E871008	06-30-20
Illinois	NELAP	5	200005	06-30-20
Kansas	NELAP	7	E-10350	01-31-20
Kansas	NELAP		E-10350	03-31-20
Kentucky (UST)	State Program	4	162013	04-30-20
Kentucky (WW)	State		KY98043	12-31-19
Kentucky (WW)	State Program	4	KY98043	12-31-19
Louisiana	NELAP	6	04041	06-30-20
Minnesota	NELAP	5	042-999-482	12-31-19
Nevada	State Program	9	PA00164	07-31-20
New Hampshire	NELAP	1	2030	04-04-20
New Jersey	NELAP	2	PA005	06-30-20
New York	NELAP	2	11182	03-31-20
New York	NELAP		11182	04-01-20
North Carolina (WW/SW)	State Program	4	434	12-31-19
North Dakota	State Program	8	R-227	04-30-20
Oregon	NELAP	10	PA-2151	02-06-20
Oregon	NELAP		PA-2151	02-06-20
Pennsylvania	NELAP	3	02-00416	04-30-20
Pennsylvania	NELAP		02-00416	04-30-20
Rhode Island	State Program	1	LAO00362	12-30-19
South Carolina	State Program	4	89014	04-30-20
Texas	NELAP	6	T104704528-15-2	03-31-20
US Fish & Wildlife	Federal		LE94312A-1	07-31-19
US Fish & Wildlife	US Federal Programs		058448	07-31-20
USDA	Federal		P-Soil-01	06-26-22
Utah	NELAP	8	PA001462015-4	05-31-20
Utah	NELAP		PA001462019-8	05-31-20
Virginia	NELAP	3	460189	09-14-19
Virginia	NELAP		10043	09-14-19
West Virginia DEP	State		142	01-31-20
West Virginia DEP	State Program	3	142	01-31-20
Wisconsin	State		998027800	08-31-19
Wisconsin	State Program	5	998027800	08-31-19

Accreditation/Certification Summary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State		2886	06-30-20
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Hawaii	State Program	9	NA	06-30-20
Illinois	NELAP	5	200023	11-30-19
Illinois	NELAP		004553	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State		KY90125	12-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Louisiana (DW)	State		LA011	12-31-19
Maryland	State		310	09-30-20
Maryland	State Program	3	310	09-30-20
Michigan	State Program	5	9005	06-30-20
Missouri	State		780	06-30-22
Missouri	State Program	7	780	06-30-20
New Jersey	NELAP	2	MO002	06-30-20
New Jersey	NELAP		MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-20
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-20
Texas	NELAP	6	T104704193-19-14	07-31-20
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-20
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542019-11	07-31-20
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-90606-1	CCR-SP-1	Water	05/24/19 11:30	05/29/19 09:30	
180-90606-2	CCR-SP-2	Water	05/24/19 12:30	05/29/19 09:30	
180-90606-3	CCR-SP-3	Water	05/24/19 13:50	05/29/19 09:30	
180-90606-4	CCR-AP-1R	Water	05/24/19 10:30	05/29/19 09:30	
180-90606-5	CCR-AP-2R	Water	05/24/19 09:40	05/29/19 09:30	
180-90606-6	BLIND DUPLICATE 3	Water	05/24/19 00:00	05/29/19 09:30	
180-90606-7	FIIELD BLANK 3	Water	05/24/19 14:00	05/29/19 09:30	

Method Summary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 7470A	Mercury (CVAA)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

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

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Client Sample ID: CCR-SP-1
Lab Sample ID: 180-90606-1
Date Collected: 05/24/19 11:30
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 10:05	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			280440	06/03/19 10:20	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 17:45	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 11:56	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:44	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:31	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.32 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315		1			434025	07/08/19 05:37	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.32 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320		1			433323	07/01/19 09:55	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-SP-2
Lab Sample ID: 180-90606-2
Date Collected: 05/24/19 12:30
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 07:40	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		5			280440	06/03/19 07:55	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 17:54	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:06	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:45	KAK	TAL PIT
	Instrument ID: HGZ									

Lab Chronicle

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Client Sample ID: CCR-SP-2
Lab Sample ID: 180-90606-2
Date Collected: 05/24/19 12:30
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:33	RJP	TAL PIT
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.39 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315		1			434025	07/08/19 05:37	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.39 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320		1			433323	07/01/19 09:56	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-SP-3
Lab Sample ID: 180-90606-3
Date Collected: 05/24/19 13:50
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 07:25	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 17:57	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 12:59	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:09	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:45	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:34	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.75 mL	1.0 g	431020	06/06/19 06:46	EJQ	TAL SL
Total/NA	Analysis	9315		1			434025	07/08/19 05:38	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.75 mL	1.0 g	431030	06/06/19 07:23	EJQ	TAL SL
Total/NA	Analysis	9320		1			433358	07/01/19 09:59	CDR	TAL SL
	Instrument ID: GFPCPROTEAN									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-1R

Lab Sample ID: 180-90606-4

Date Collected: 05/24/19 10:30

Matrix: Water

Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 10:35	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			280440	06/03/19 10:50	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 18:00	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:12	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:46	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:37	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.19 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315		1			439048	08/09/19 15:21	CDR	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.19 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320		1			435710	07/19/19 12:26	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-AP-2R

Lab Sample ID: 180-90606-5

Date Collected: 05/24/19 09:40

Matrix: Water

Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			280440	06/03/19 12:07	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		25			280440	06/03/19 12:22	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 18:03	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:15	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		10			281393	06/11/19 09:02	RSK	TAL PIT
	Instrument ID: A									

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-90606-1

Client Sample ID: CCR-AP-2R

Lab Sample ID: 180-90606-5
Matrix: Water
Date Collected: 05/24/19 09:40
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:47	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:40	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.86 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315		1			439047	08/09/19 17:23	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Prep	PrecSep_0			1000.86 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320		1			435710	07/19/19 12:26	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: BLIND DUPLICATE 3

Lab Sample ID: 180-90606-6
Matrix: Water
Date Collected: 05/24/19 00:00
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 11:06	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		5			280440	06/03/19 11:21	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 18:06	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:18	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:48	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:42	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			999.98 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315		1			439047	08/09/19 17:23	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Prep	PrecSep_0			999.98 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320		1			435710	07/19/19 12:26	CDR	TAL SL
	Instrument ID: GFPCORANGE									

Lab Chronicle

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Client Sample ID: BLIND DUPLICATE 3
Lab Sample ID: 180-90606-6
Date Collected: 05/24/19 00:00
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL

Client Sample ID: FIIELD BLANK 3
Lab Sample ID: 180-90606-7
Date Collected: 05/24/19 14:00
Matrix: Water
Date Received: 05/29/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			280440	06/03/19 08:17	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281140	06/07/19 18:09	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	280522	06/03/19 13:03	NAM	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			281159	06/08/19 12:22	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Prep	7470A			50 mL	50 mL	280477	06/03/19 09:31	JJZ	TAL PIT
Total/NA	Analysis	EPA 7470A		1			280561	06/03/19 16:49	KAK	TAL PIT
	Instrument ID: HGZ									
Total/NA	Analysis	EPA 9040C		1			280283	05/31/19 14:43	RJP	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	280217	05/30/19 14:24	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.48 mL	1.0 g	431125	06/07/19 07:24	EJQ	TAL SL
Total/NA	Analysis	9315		1			439047	08/09/19 17:24	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Prep	PrecSep_0			1000.48 mL	1.0 g	431128	06/07/19 08:17	EJQ	TAL SL
Total/NA	Analysis	9320		1			435710	07/19/19 12:26	CDR	TAL SL
	Instrument ID: GFPCORANGE									
Total/NA	Analysis	Ra226_Ra228		1			439354	08/13/19 08:59	SMP	TAL SL
	Instrument ID: NOEQUIP									

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-90606-1

Analyst References:

Lab: TAL PIT

Batch Type: Prep

JJZ = Joseph Zubrow
NAM = Nicole Marfisi

Batch Type: Analysis

AVS = Abbey Smith
KAK = Kayla Kalamasz
MJH = Matthew Hartman
RJP = Rockwell Pokrant
RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

EJQ = Erin Quinn

Batch Type: Analysis

CDR = Conrad Reuscher
SMP = Siobhan Perry

Client Sample ID: CCR-SP-1
Lab Sample ID: 180-90606-1

Date Collected: 05/24/19 11:30
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**130**		1.0	0.71	mg/L			06/03/19 10:05	1
Fluoride	**0.20**		0.10	0.026	mg/L			06/03/19 10:05	1
Sulfate	**1000**		10	3.8	mg/L			06/03/19 10:20	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0036**		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:45	1
Boron	**0.34**		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 11:56	1
Barium	**0.089**	**B**	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:45	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 11:56	1
Calcium	**270**		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:45	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Cobalt	**0.0078**		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:45	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:45	1
Molybdenum	**0.0012**	**J**	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:45	1
Lead	**0.00020**	**J**	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:45	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:45	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:45	1
Lithium	**5.9**		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 11:56	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2000**		20	20	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.0**	**HF**	0.1	0.1	SU			05/31/19 14:31	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.149**		0.0912	0.0922	1.00	0.120	pCi/L	06/06/19 06:46	07/08/19 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.3*		*40 - 110*	*06/06/19 06:46*	*07/08/19 05:37*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.335	U	0.320	0.321	1.00	0.518	pCi/L	06/06/19 07:23	07/01/19 09:55	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.3*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:55*	*1*
Y Carrier	*86.7*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:55*	*1*

Client Sample ID: CCR-SP-1
Lab Sample ID: 180-90606-1
Date Collected: 05/24/19 11:30
Matrix: Water
Date Received: 05/29/19 09:30

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.483	U	0.333	0.334	5.00	0.518	pCi/L		08/13/19 08:59	1

Client Sample ID: CCR-SP-2
Lab Sample ID: 180-90606-2
Date Collected: 05/24/19 12:30
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**66**		1.0	0.71	mg/L			06/03/19 07:40	1
Fluoride	**0.32**		0.10	0.026	mg/L			06/03/19 07:40	1
Sulfate	**330**		5.0	1.9	mg/L			06/03/19 07:55	5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0014**		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:54	1
Boron	**0.15**		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 12:06	1
Barium	**0.12**	**B**	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:54	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 12:06	1
Calcium	**160**		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:54	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Cobalt	**0.0021**		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:54	1
Chromium	**0.0020**		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:54	1
Molybdenum	**0.0014**	**J**	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:54	1
Lead	**0.00086**	**J**	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:54	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:54	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:54	1
Lithium	**7.0**		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 12:06	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.2**	**HF**	0.1	0.1	SU			05/31/19 14:33	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.258**		0.119	0.121	1.00	0.136	pCi/L	06/06/19 06:46	07/08/19 05:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.8*		*40 - 110*	*06/06/19 06:46*	*07/08/19 05:37*	*1*

Client Sample ID: CCR-SP-2
Lab Sample ID: 180-90606-2
Date Collected: 05/24/19 12:30
Matrix: Water
Date Received: 05/29/19 09:30

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.320	U	0.272	0.273	1.00	0.432	pCi/L	06/06/19 07:23	07/01/19 09:56	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.8*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:56*	*1*
Y Carrier	*80.7*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:56*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.578**		0.297	0.299	5.00	0.432	pCi/L		08/13/19 08:59	1

Client Sample ID: CCR-SP-3
Lab Sample ID: 180-90606-3
Date Collected: 05/24/19 13:50
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**23**		1.0	0.71	mg/L			06/03/19 07:25	1
Fluoride	**0.25**		0.10	0.026	mg/L			06/03/19 07:25	1
Sulfate	**36**		1.0	0.38	mg/L			06/03/19 07:25	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0017**		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 17:57	1
Boron	ND		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 12:09	1
Barium	**0.057**	**B**	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 17:57	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 12:09	1
Calcium	**93**		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 17:57	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Cobalt	**0.00026**	**J**	0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 17:57	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 17:57	1
Molybdenum	**0.0016**	**J**	0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 17:57	1
Lead	**0.00015**	**J**	0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 17:57	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 17:57	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 17:57	1
Lithium	**4.0**	**J**	5.0	3.1	ug/L		06/03/19 12:59	06/08/19 12:09	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**580**		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1	0.1	SU			05/31/19 14:34	1

Client Sample ID: CCR-SP-3

Date Collected: 05/24/19 13:50
Date Received: 05/29/19 09:30

Lab Sample ID: 180-90606-3
Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0325	U	0.0464	0.0465	1.00	0.121	pCi/L	06/06/19 06:46	07/08/19 05:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*40 - 110*	*06/06/19 06:46*	*07/08/19 05:38*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.174	U	0.344	0.345	1.00	0.583	pCi/L	06/06/19 07:23	07/01/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.4*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:59*	*1*
Y Carrier	*78.5*		*40 - 110*	*06/06/19 07:23*	*07/01/19 09:59*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.141	U	0.347	0.348	5.00	0.583	pCi/L		08/13/19 08:59	1

Client Sample ID: CCR-AP-1R

Date Collected: 05/24/19 10:30
Date Received: 05/29/19 09:30

Lab Sample ID: 180-90606-4
Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**69**		1.0	0.71	mg/L			06/03/19 10:35	1
Fluoride	**0.57**		0.10	0.026	mg/L			06/03/19 10:35	1
Sulfate	**530**		10	3.8	mg/L			06/03/19 10:50	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00047**	**J**	0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:00	1
Boron	**4.5**		0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:12	1
Barium	**0.025**	**B**	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:00	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:12	1
Calcium	**68**		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:00	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Cobalt	**0.00021**	**J**	0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:00	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:00	1
Molybdenum	**0.0042**	**J**	0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:00	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:00	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:00	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:00	1
Lithium	**3.6**	**J**	5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:12	1

Client Sample ID: CCR-AP-1R
Lab Sample ID: 180-90606-4
Date Collected: 05/24/19 10:30
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1500**		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.5**	**HF**	0.1	0.1	SU			05/31/19 14:37	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0879	U	0.0693	0.0697	1.00	0.101	pCi/L	06/07/19 07:24	08/09/19 15:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*40 - 110*	*06/07/19 07:24*	*08/09/19 15:21*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0354	U	0.241	0.241	1.00	0.444	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*
Y Carrier	*77.4*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0526	U	0.251	0.251	5.00	0.444	pCi/L		08/13/19 08:59	1

Client Sample ID: CCR-AP-2R
Lab Sample ID: 180-90606-5
Date Collected: 05/24/19 09:40
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**530**		25	18	mg/L			06/03/19 12:22	25
Fluoride	**0.47**		0.25	0.066	mg/L			06/03/19 12:07	2.5
Sulfate	**2600**		25	9.5	mg/L			06/03/19 12:22	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00053**	**J**	0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:03	1
Boron	**11**		0.80	0.30	mg/L		06/03/19 13:03	06/11/19 09:02	10
Barium	**0.042**	**B**	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:03	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:15	1
Calcium	**300**		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:03	1
Cadmium	**0.00059**	**J**	0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1

Client Sample ID: CCR-AP-2R
Lab Sample ID: 180-90606-5
Date Collected: 05/24/19 09:40
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.0026**		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:03	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:03	1
Molybdenum	**1.9**		0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:03	1
Lead	**0.00016**	**J**	0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:03	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:03	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:03	1
Lithium	**33**		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:15	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**4100**		40	40	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1	0.1	SU			05/31/19 14:40	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.264**		0.0996	0.102	1.00	0.103	pCi/L	06/07/19 07:24	08/09/19 17:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*40 - 110*	*06/07/19 07:24*	*08/09/19 17:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.448**		0.288	0.291	1.00	0.439	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*
Y Carrier	*78.9*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.713**		0.305	0.308	5.00	0.439	pCi/L		08/13/19 08:59	1

Client Sample ID: BLIND DUPLICATE 3
Lab Sample ID: 180-90606-6
Date Collected: 05/24/19 00:00
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**65**		1.0	0.71	mg/L			06/03/19 11:06	1

Client Sample ID: BLIND DUPLICATE 3

Date Collected: 05/24/19 00:00
Date Received: 05/29/19 09:30

Lab Sample ID: 180-90606-6

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**0.29**		0.10	0.026	mg/L			06/03/19 11:06	1
Sulfate	**320**		5.0	1.9	mg/L			06/03/19 11:21	5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0021**		0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:06	1
Boron	**0.26**		0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:18	1
Barium	**0.13**	**B**	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:06	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:18	1
Calcium	**170**		0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:06	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Cobalt	**0.0025**		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:06	1
Chromium	**0.0025**		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:06	1
Molybdenum	**0.0017**	**J**	0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:06	1
Lead	**0.0015**		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:06	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:06	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:06	1
Lithium	**9.7**		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:18	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1000**		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**7.3**	**HF**	0.1	0.1	SU			05/31/19 14:42	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.121**		0.0792	0.0799	1.00	0.110	pCi/L	06/07/19 07:24	08/09/19 17:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.7*		*40 - 110*	*06/07/19 07:24*	*08/09/19 17:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.188	U	0.323	0.324	1.00	0.546	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.7*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*
Y Carrier	*81.9*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*

Client Sample ID: BLIND DUPLICATE 3
Lab Sample ID: 180-90606-6
Date Collected: 05/24/19 00:00
Matrix: Water
Date Received: 05/29/19 09:30

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.309	U	0.333	0.334	5.00	0.546	pCi/L		08/13/19 08:59	1

Client Sample ID: FIIELD BLANK 3
Lab Sample ID: 180-90606-7
Date Collected: 05/24/19 14:00
Matrix: Water
Date Received: 05/29/19 09:30

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			06/03/19 08:17	1
Fluoride	**0.18**		0.10	0.026	mg/L			06/03/19 08:17	1
Sulfate	ND		1.0	0.38	mg/L			06/03/19 08:17	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		06/03/19 13:03	06/07/19 18:09	1
Boron	**0.069**	**J**	0.080	0.030	mg/L		06/03/19 13:03	06/08/19 12:22	1
Barium	**0.0085**	**J B**	0.010	0.0015	mg/L		06/03/19 13:03	06/07/19 18:09	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 13:03	06/08/19 12:22	1
Calcium	**0.14**	**J**	0.50	0.12	mg/L		06/03/19 13:03	06/07/19 18:09	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Cobalt	ND		0.00050	0.000075	mg/L		06/03/19 13:03	06/07/19 18:09	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 13:03	06/07/19 18:09	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/03/19 13:03	06/07/19 18:09	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 13:03	06/07/19 18:09	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 13:03	06/07/19 18:09	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 13:03	06/07/19 18:09	1
Lithium	ND		5.0	3.1	ug/L		06/03/19 13:03	06/08/19 12:22	1

Method: EPA 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/30/19 14:24	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.5**	**HF**	0.1	0.1	SU			05/31/19 14:43	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0430	U	0.0657	0.0658	1.00	0.113	pCi/L	06/07/19 07:24	08/09/19 17:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*40 - 110*	*06/07/19 07:24*	*08/09/19 17:24*	*1*

Client Sample Results

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

Client Sample ID: FIIELD BLANK 3
Lab Sample ID: 180-90606-7
Date Collected: 05/24/19 14:00
Matrix: Water
Date Received: 05/29/19 09:30

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0227	U	0.466	0.466	1.00	0.838	pCi/L	06/07/19 08:17	07/19/19 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*
Y Carrier	*45.6*		*40 - 110*	*06/07/19 08:17*	*07/19/19 12:26*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0204	U	0.471	0.471	5.00	0.838	pCi/L		08/13/19 08:59	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-280440/6
Matrix: Water
Analysis Batch: 280440

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.71	mg/L			06/03/19 05:02	1
Fluoride	ND		0.10	0.026	mg/L			06/03/19 05:02	1
Sulfate	ND		1.0	0.38	mg/L			06/03/19 05:02	1

Lab Sample ID: LCS 180-280440/5
Matrix: Water
Analysis Batch: 280440

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.0		mg/L		100	80 - 120
Fluoride	1.25	1.28		mg/L		102	80 - 120
Sulfate	25.0	24.5		mg/L		98	80 - 120

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-280522/1-A
Matrix: Water
Analysis Batch: 281140

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		06/03/19 12:59	06/07/19 16:42	1
Barium	0.00154	J	0.010	0.0015	mg/L		06/03/19 12:59	06/07/19 16:42	1
Calcium	ND		0.50	0.12	mg/L		06/03/19 12:59	06/07/19 16:42	1
Cadmium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1
Cobalt	ND		0.00050	0.000075	mg/L		06/03/19 12:59	06/07/19 16:42	1
Chromium	ND		0.0020	0.0015	mg/L		06/03/19 12:59	06/07/19 16:42	1
Molybdenum	ND		0.0050	0.00061	mg/L		06/03/19 12:59	06/07/19 16:42	1
Lead	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1
Antimony	ND		0.0020	0.00038	mg/L		06/03/19 12:59	06/07/19 16:42	1
Selenium	ND		0.0050	0.0026	mg/L		06/03/19 12:59	06/07/19 16:42	1
Thallium	ND		0.0010	0.00013	mg/L		06/03/19 12:59	06/07/19 16:42	1

Lab Sample ID: MB 180-280522/1-A
Matrix: Water
Analysis Batch: 281159

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.030	mg/L		06/03/19 12:59	06/08/19 10:49	1
Beryllium	ND		0.0010	0.00016	mg/L		06/03/19 12:59	06/08/19 10:49	1
Lithium	ND		5.0	3.1	ug/L		06/03/19 12:59	06/08/19 10:49	1

Lab Sample ID: LCS 180-279554/2-C
Matrix: Water
Analysis Batch: 281140

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.936		mg/L		94	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Calcium	25.0	25.0		mg/L		100	80 - 120
Cadmium	0.500	0.505		mg/L		101	80 - 120

Method: EPA 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 180-279554/2-C
Matrix: Water
Analysis Batch: 281140

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	0.500	0.469		mg/L		94	80 - 120
Chromium	0.500	0.507		mg/L		101	80 - 120
Molybdenum	0.500	0.501		mg/L		100	80 - 120
Lead	0.500	0.503		mg/L		101	80 - 120
Antimony	0.250	0.259		mg/L		103	80 - 120
Selenium	1.00	0.928		mg/L		93	80 - 120
Thallium	1.00	1.00		mg/L		100	80 - 120

Lab Sample ID: LCS 180-279554/2-C
Matrix: Water
Analysis Batch: 281159

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.23		mg/L		98	80 - 120
Beryllium	0.500	0.478		mg/L		96	80 - 120
Lithium	500	478		ug/L		96	80 - 120

Lab Sample ID: LCS 180-280522/2-A
Matrix: Water
Analysis Batch: 281140

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.998		mg/L		100	80 - 120
Barium	1.00	1.05		mg/L		105	80 - 120
Calcium	25.0	26.9		mg/L		108	80 - 120
Cadmium	0.500	0.534		mg/L		107	80 - 120
Cobalt	0.500	0.499		mg/L		100	80 - 120
Chromium	0.500	0.540		mg/L		108	80 - 120
Molybdenum	0.500	0.537		mg/L		107	80 - 120
Lead	0.500	0.538		mg/L		108	80 - 120
Antimony	0.250	0.274		mg/L		110	80 - 120
Selenium	1.00	0.992		mg/L		99	80 - 120
Thallium	1.00	1.06		mg/L		106	80 - 120

Lab Sample ID: LCS 180-280522/2-A
Matrix: Water
Analysis Batch: 281159

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 280522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.29		mg/L		103	80 - 120
Beryllium	0.500	0.514		mg/L		103	80 - 120
Lithium	500	505		ug/L		101	80 - 120

Method: EPA 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-280477/1-A
Matrix: Water
Analysis Batch: 280561

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 280477

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		06/03/19 09:31	06/03/19 16:13	1

Lab Sample ID: LCS 180-280477/2-A
Matrix: Water
Analysis Batch: 280561

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280477

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00250	0.00245		mg/L		98	80 - 120

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-280283/1
Matrix: Water
Analysis Batch: 280283

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-90606-4 DU
Matrix: Water
Analysis Batch: 280283

Client Sample ID: CCR-AP-1R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	HF	7.5		SU		0.5	2

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-280217/2
Matrix: Water
Analysis Batch: 280217

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/30/19 14:24	1

Lab Sample ID: LCS 180-280217/1
Matrix: Water
Analysis Batch: 280217

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	201	222		mg/L		110	80 - 120

Lab Sample ID: 180-90606-3 DU
Matrix: Water
Analysis Batch: 280217

Client Sample ID: CCR-SP-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	580		568		mg/L		1	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-431020/23-A
Matrix: Water
Analysis Batch: 434025

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431020

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.04950	U	0.0811	0.0812	1.00	0.140	pCi/L	06/06/19 06:46	07/08/19 05:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.7*		*40 - 110*	*06/06/19 06:46*	*07/08/19 05:38*	*1*

Lab Sample ID: LCS 160-431020/1-A
Matrix: Water
Analysis Batch: 433742

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431020

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	10.35		1.13	1.00	0.131	pCi/L	91	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*99.2*		*40 - 110*

Lab Sample ID: MB 160-431125/23-A
Matrix: Water
Analysis Batch: 439116

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431125

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03539	U	0.0538	0.0539	1.00	0.0926	pCi/L	06/07/19 07:24	08/10/19 14:51	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*06/07/19 07:24*	*08/10/19 14:51*	*1*

Lab Sample ID: LCS 160-431125/1-A
Matrix: Water
Analysis Batch: 439048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431125

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	9.581		1.01	1.00	0.0926	pCi/L	84	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.2*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-431030/23-A
Matrix: Water
Analysis Batch: 433358

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431030

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1723	U	0.224	0.225	1.00	0.430	pCi/L	06/06/19 07:23	07/01/19 09:59	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110	06/06/19 07:23	07/01/19 09:59	1
Y Carrier	86.7		40 - 110	06/06/19 07:23	07/01/19 09:59	1

Lab Sample ID: LCS 160-431030/1-A
Matrix: Water
Analysis Batch: 433226

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431030

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.07	10.95		1.33	1.00	0.540	pCi/L	121	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.2		40 - 110
Y Carrier	59.4		40 - 110

Lab Sample ID: MB 160-431128/23-A
Matrix: Water
Analysis Batch: 435708

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431128

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.08967	U	0.295	0.295	1.00	0.540	pCi/L	06/07/19 08:17	07/19/19 12:31	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	06/07/19 08:17	07/19/19 12:31	1
Y Carrier	66.2		40 - 110	06/07/19 08:17	07/19/19 12:31	1

Lab Sample ID: LCS 160-431128/1-A
Matrix: Water
Analysis Batch: 435710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431128

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.01	10.71		1.28	1.00	0.494	pCi/L	119	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	91.2		40 - 110
Y Carrier	75.1		40 - 110

QC Association Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-90606-1

HPLC/IC

Analysis Batch: 280440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9056A	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9056A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	EPA 9056A	
MB 180-280440/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-280440/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Metals

Filtration Batch: 279554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	Filtration	

Prep Batch: 280477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	7470A	
180-90606-2	CCR-SP-2	Total/NA	Water	7470A	
180-90606-3	CCR-SP-3	Total/NA	Water	7470A	
180-90606-4	CCR-AP-1R	Total/NA	Water	7470A	
180-90606-5	CCR-AP-2R	Total/NA	Water	7470A	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	7470A	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	7470A	
MB 180-280477/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-280477/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 280522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	3005A	
180-90606-2	CCR-SP-2	Total Recoverable	Water	3005A	
180-90606-3	CCR-SP-3	Total Recoverable	Water	3005A	
180-90606-4	CCR-AP-1R	Total Recoverable	Water	3005A	
180-90606-5	CCR-AP-2R	Total Recoverable	Water	3005A	
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	3005A	
180-90606-7	FIIELD BLANK 3	Total Recoverable	Water	3005A	
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	3005A	279554
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 280561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 7470A	280477
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 7470A	280477
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 7470A	280477

Metals (Continued)

Analysis Batch: 280561 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 7470A	280477
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 7470A	280477
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 7470A	280477
180-90606-7	FIIELD BLANK 3	Total/NA	Water	EPA 7470A	280477
MB 180-280477/1-A	Method Blank	Total/NA	Water	EPA 7470A	280477
LCS 180-280477/2-A	Lab Control Sample	Total/NA	Water	EPA 7470A	280477

Analysis Batch: 281140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	280522
180-90606-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	280522
180-90606-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	280522
180-90606-4	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	280522
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	280522
180-90606-7	FIIELD BLANK 3	Total Recoverable	Water	EPA 6020A	280522
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	280522
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522

Analysis Batch: 281159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	280522
180-90606-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	280522
180-90606-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	280522
180-90606-4	CCR-AP-1R	Total Recoverable	Water	EPA 6020A	280522
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522
180-90606-6	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	280522
180-90606-7	FIIELD BLANK 3	Total Recoverable	Water	EPA 6020A	280522
MB 180-280522/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	280522
LCS 180-279554/2-C	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522
LCS 180-280522/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	280522

Analysis Batch: 281393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-5	CCR-AP-2R	Total Recoverable	Water	EPA 6020A	280522

General Chemistry

Analysis Batch: 280217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	SM 2540C	
180-90606-2	CCR-SP-2	Total/NA	Water	SM 2540C	
180-90606-3	CCR-SP-3	Total/NA	Water	SM 2540C	
180-90606-4	CCR-AP-1R	Total/NA	Water	SM 2540C	
180-90606-5	CCR-AP-2R	Total/NA	Water	SM 2540C	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	SM 2540C	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	SM 2540C	
MB 180-280217/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-280217/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-90606-3 DU	CCR-SP-3	Total/NA	Water	SM 2540C	

QC Association Summary

Client: Vectren Corporation
Job ID: 180-90606-1
Project/Site: CCR Groundwater Monitoring AB Brown

General Chemistry

Analysis Batch: 280283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	EPA 9040C	
180-90606-2	CCR-SP-2	Total/NA	Water	EPA 9040C	
180-90606-3	CCR-SP-3	Total/NA	Water	EPA 9040C	
180-90606-4	CCR-AP-1R	Total/NA	Water	EPA 9040C	
180-90606-5	CCR-AP-2R	Total/NA	Water	EPA 9040C	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	EPA 9040C	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	EPA 9040C	
LCS 180-280283/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-90606-4 DU	CCR-AP-1R	Total/NA	Water	EPA 9040C	

Rad

Prep Batch: 431020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	PrecSep-21	
180-90606-2	CCR-SP-2	Total/NA	Water	PrecSep-21	
180-90606-3	CCR-SP-3	Total/NA	Water	PrecSep-21	
MB 160-431020/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431020/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 431030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-1	CCR-SP-1	Total/NA	Water	PrecSep_0	
180-90606-2	CCR-SP-2	Total/NA	Water	PrecSep_0	
180-90606-3	CCR-SP-3	Total/NA	Water	PrecSep_0	
MB 160-431030/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431030/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Prep Batch: 431125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	PrecSep-21	
180-90606-5	CCR-AP-2R	Total/NA	Water	PrecSep-21	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	PrecSep-21	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	PrecSep-21	
MB 160-431125/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431125/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 431128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-90606-4	CCR-AP-1R	Total/NA	Water	PrecSep_0	
180-90606-5	CCR-AP-2R	Total/NA	Water	PrecSep_0	
180-90606-6	BLIND DUPLICATE 3	Total/NA	Water	PrecSep_0	
180-90606-7	FIIELD BLANK 3	Total/NA	Water	PrecSep_0	
MB 160-431128/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431128/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Jacob Winsett	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-49738-8017.1
Client Contact: Angela Casbon Scheller	Phone: (812) 228-9422	E-Mail: veronica.bortot@testamericainc.com		Page: Page 1 of 1
Company: Vectren Corporation				Job #:
Address: PO BOX 209	Due Date Requested:			
City: Evansville	TAT Requested (days):			
State, Zip: IN, 47702				
Phone: 864-214-8750(Tel)	PO #: Purchase Order Requested			
Email: acscheller@Vectren.com	WO #:			
Project Name: CCR Groundwater Monitoring - AB Brown	Project #: 18016014			
Site: AB Brown	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226, 9320_Ra228	9040C, 9056A_ORGFM_28D	6020A, 7470A	2540C_Calcd - TDS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N	D	N		
~~CCR-AP-2I~~ CCR-SP-1	5-27-19	1130	G	Water			X	X	X	X		Appendix III & Appendix IV
~~CCR-AP-3I~~ CCR-SP-2		1230		Water								analytes needed; No Sb, Ve, Tl
~~CCR-AP-8~~ CCR-SP-3		1350		Water								
~~CCR-AP-9~~ CCR-AP-1R		1030		Water								
~~CCR-AP-10~~ CCR-AP-2R		0940		Water								
~~CCR-AP-~~ Blind Duplicate 3		—		Water								
Field Blank 3		1400		L								

180-90606 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☒ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Fedex

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Jacob Winsett	5-28-19 / 1930	ATC	Fedex		
	Relinquished by:	Date/Time:	Company	Received by: Allen Watson	Date/Time: 5-29-19	Company TAP IT
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9:30	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

ORIGIN ID:EVVA (812) 477-1176
BRIAN KLEEMAN

1149 WEDEKING AVENUE
BUILDING D, SUITE 2
EVANSVILLE, IN 47715
UNITED STATES US

SHIP DATE: 28MAY19
ACTWGT: 50.00 LB
CAD: 106997842/INET4100
DIMS: 18x13x10 IN

BILL SENDER

TO VERONICA BORTOT
TESTAMERICA
301 ALPHA DRIVE

PITTSBURGH PA 15238
(412) 963-7058 REF: 170LF00739 + 170LF00738
INV: 170LF00739 + 170LF00738
PO: DEPT:

565J1/D66C/23AD

FedEx Express

E

J191019010701uv

WED - 29 MAY 10:30A
PRIORITY OVERNIGHT

4 of 5
MPS# 7753 2860 3324
0263
Mstr# 7753 2860 3302
0201

15238
PIT
PA-US

NA AGCA

Uncorrected temp 2.5 C
Thermometer ID 10
CF 0 Initials JJ
PT-WI-SR-001 effective 11/8/18

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

180-90606 Waybill

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
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ORIGIN ID:EVVA (812) 477-1176
BRIAN KLEEMAN

1149 WEDEKING AVENUE
BUILDING D, SUITE 2
EVANSVILLE, IN 47715
UNITED STATES US

SHIP DATE: 28MAY19
ACTWGT: 50.00 LB
CAD: 106997842/INET4100
DIMS: 18x13x10 IN

BILL SENDER

TO VERONICA BORTOT
TESTAMERICA
301 ALPHA DRIVE

PITTSBURGH PA 15238

(412) 963-7058 REF: 170LF00739 + 170LF00738
INV: 170LF00739 + 170LF00738
PO: DEPT:

565J1/D66C/23AD

FedEx Express

J1910190107uu

WED - 29 MAY 10:30A
PRIORITY OVERNIGHT

5 of 5

MPS# 7753 2860 3482
0263
Mstr# 7753 2860 3302

0201

15238
PIT

NA AGCA

PA-US

Uncorrected temp 21 °C
Thermometer ID 10
CF 0 Initials 13

PT-WI-SR-001 effective 11/8/18

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Eurofins TestAmerica, Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone: 412-963-7058 Fax: 412-963-2468

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-364426.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: veronica.bortot@testamericainc.com	State of Origin: Indiana	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 180-90606-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/10/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CCR Groundwater Monitoring FB Culley	Project #: 18016014			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
CCR-SP-1 (180-90606-1)	5/24/19	11:30 Eastern		Water			X	X	X	2	
CCR-SP-2 (180-90606-2)	5/24/19	12:30 Eastern		Water			X	X	X	2	
CCR-SP-3 (180-90606-3)	5/24/19	13:50 Eastern		Water			X	X	X	2	
CCR-AP-1R (180-90606-4)	5/24/19	10:30 Eastern		Water			X	X	X	2	
CCR-AP-2R (180-90606-5)	5/24/19	09:40 Eastern		Water			X	X	X	2	
BLIND DUPLICATE 3 (180-90606-6)	5/24/19	Eastern		Water			X	X	X	2	
FIIELD BLANK 3 (180-90606-7)	5/24/19	14:00 Eastern		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 5/31/19 1700	Company FD PTS	Received by: Michael Hum	Date/Time: 6-1-19 8:50	Company TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-90606-1

Login Number: 90606
List Number: 1
Creator: Watson, Debbie

List Source: Eurofins TestAmerica, Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-90606-1

Login Number: 90606
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 06/01/19 11:11 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	22.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-97469-1
Client Project/Site: CCR Groundwater Monitoring AB Brown

For:
Vectren Corporation
PO BOX 209
Evansville, Indiana 47702

Attn: Accounts Payable

Authorized for release by:
11/25/2019 10:00:16 AM

Veronica Bortot, Senior Project Manager
(412)963-2435
veronica.bortot@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-97469-1

Laboratory: Eurofins TestAmerica, Pittsburgh

Narrative

Job Narrative
180-97469-1

Receipt
The samples were received on 10/18/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

Receipt Exceptions
The Chain of Custody was received without any analyses selected. The requested tests are listed on the COC; however they are not checked. The tests were chosen from the container labels.

Anions
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Radiological 226/228
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
CCR-SP-1 (180-97469-1), CCR-SP-2 (180-97469-2), CCR-SP-3 (180-97469-3), BLIND DUPLICATE 3 (180-97469-4), FIELD BLANK 3 (180-97469-5), (LCS 160-447760/1-A), (LCSD 160-447760/2-A) and (MB 160-447760/20-A)

The following samples had matrix observations: CCR-SP-3 (180-97469-3). Samples 180-97624-B-1 and 180-97469-A-3 had white cloudy discoloration.

Insufficient sample volume was available to perform a sample duplicate for the following samples: CCR-SP-1 (180-97469-1), CCR-SP-2 (180-97469-2), CCR-SP-3 (180-97469-3), BLIND DUPLICATE 3 (180-97469-4) and FIELD BLANK 3 (180-97469-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision. Sample 400-178335-A-4 was also reduced due to insufficient volume available.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Methods 6020A, 6020B: The following samples were diluted due to the nature of the sample matrix: (180-97385-E-2-B ^10), (180-97385-E-2-C MS ^10), (180-97385-E-2-D MSD ^10), (180-97385-E-2-B PDS ^10) and (180-97385-E-2-B SD ^50). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Vectren Corporation
Job ID: 180-97469-1
Project/Site: CCR Groundwater Monitoring AB Brown

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Vectren Corporation
Job ID: 180-97469-1
Project/Site: CCR Groundwater Monitoring AB Brown

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State	434	12-31-19
North Dakota	State	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
South Carolina	State	89014	04-30-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	01-31-20
Wisconsin	State	998027800	08-31-20

Accreditation/Certification Summary

Client: Vectren Corporation
Job ID: 180-97469-1
Project/Site: CCR Groundwater Monitoring AB Brown

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-19
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	12-01-19

Sample Summary

Client: Vectren Corporation
Job ID: 180-97469-1
Project/Site: CCR Groundwater Monitoring AB Brown

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-97469-1	CCR-SP-1	Water	10/15/19 13:35	10/18/19 09:00	
180-97469-2	CCR-SP-2	Water	10/17/19 10:20	10/18/19 09:00	
180-97469-3	CCR-SP-3	Water	10/15/19 15:40	10/18/19 09:00	
180-97469-4	BLIND DUPLICATE 3	Water	10/15/19 00:00	10/18/19 09:00	
180-97469-5	FIELD BLANK 3	Water	10/17/19 08:50	10/18/19 09:00	

Method Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058
TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

Client Sample ID: CCR-SP-1

Date Collected: 10/15/19 13:35
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			297483	11/08/19 15:46	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296046	10/24/19 19:07	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296189	10/25/19 15:37	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	EPA 9040C		1			296369	10/29/19 16:48	PM	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	295452	10/19/19 10:37	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.43 mL	1.0 g	447760	10/25/19 14:07	ORM	TAL SL
Total/NA	Analysis	9315		1			450917	11/18/19 07:23	SCB	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.43 mL	1.0 g	447768	10/25/19 15:47	ORM	TAL SL
Total/NA	Analysis	9320		1			448789	11/05/19 12:53	KLS	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			451330	11/20/19 07:54	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-SP-2

Date Collected: 10/17/19 10:20
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			298011	11/13/19 15:24	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		5			298011	11/13/19 15:40	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296046	10/24/19 19:11	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296189	10/25/19 15:40	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	EPA 9040C		1			296369	10/29/19 17:00	PM	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	295454	10/19/19 10:44	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.61 mL	1.0 g	447760	10/25/19 14:07	ORM	TAL SL
Total/NA	Analysis	9315		1			450917	11/18/19 07:23	SCB	TAL SL
	Instrument ID: GFPCBLUE									

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

Client Sample ID: CCR-SP-2

Lab Sample ID: 180-97469-2
Date Collected: 10/17/19 10:20
Matrix: Water
Date Received: 10/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			1000.61 mL	1.0 g	447768	10/25/19 15:47	ORM	TAL SL
Total/NA	Analysis	9320		1			448789	11/05/19 12:53	KLS	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			451330	11/20/19 07:54	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: CCR-SP-3

Lab Sample ID: 180-97469-3
Date Collected: 10/15/19 15:40
Matrix: Water
Date Received: 10/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			297483	11/08/19 16:49	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296046	10/24/19 19:14	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296189	10/25/19 15:43	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	EPA 9040C		1			296369	10/29/19 16:58	PM	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	295452	10/19/19 10:37	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.46 mL	1.0 g	447760	10/25/19 14:07	ORM	TAL SL
Total/NA	Analysis	9315		1			450917	11/18/19 07:23	SCB	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.46 mL	1.0 g	447768	10/25/19 15:47	ORM	TAL SL
Total/NA	Analysis	9320		1			448789	11/05/19 12:53	KLS	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			451330	11/20/19 07:54	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: BLIND DUPLICATE 3

Lab Sample ID: 180-97469-4
Date Collected: 10/15/19 00:00
Matrix: Water
Date Received: 10/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			297483	11/08/19 17:21	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296046	10/24/19 19:24	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296189	10/25/19 15:47	RSK	TAL PIT
	Instrument ID: A									

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

Client Sample ID: BLIND DUPLICATE 3

Lab Sample ID: 180-97469-4
Matrix: Water
Date Collected: 10/15/19 00:00
Date Received: 10/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			296369	10/29/19 16:56	PM	TAL PIT
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	295452	10/19/19 10:37	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.11 mL	1.0 g	447760	10/25/19 14:07	ORM	TAL SL
Total/NA	Analysis	9315		1			450917	11/18/19 07:22	SCB	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.11 mL	1.0 g	447768	10/25/19 15:47	ORM	TAL SL
Total/NA	Analysis	9320		1			448789	11/05/19 12:53	KLS	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			451330	11/20/19 07:54	SMP	TAL SL
	Instrument ID: NOEQUIP									

Client Sample ID: FIELD BLANK 3

Lab Sample ID: 180-97469-5
Matrix: Water
Date Collected: 10/17/19 08:50
Date Received: 10/18/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			297717	11/11/19 00:12	MJH	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296046	10/24/19 19:28	RSK	TAL PIT
	Instrument ID: A									
Total Recoverable	Prep	3005A			50 mL	50 mL	295718	10/22/19 21:13	MWW	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			296189	10/25/19 15:57	RSK	TAL PIT
	Instrument ID: A									
Total/NA	Analysis	EPA 9040C		1			296369	10/29/19 16:52	PM	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	295454	10/19/19 10:44	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Prep	PrecSep-21			1000.35 mL	1.0 g	447760	10/25/19 14:07	ORM	TAL SL
Total/NA	Analysis	9315		1			450917	11/18/19 09:14	SCB	TAL SL
	Instrument ID: GFPCBLUE									
Total/NA	Prep	PrecSep_0			1000.35 mL	1.0 g	447768	10/25/19 15:47	ORM	TAL SL
Total/NA	Analysis	9320		1			448789	11/05/19 12:53	KLS	TAL SL
	Instrument ID: GFPCPURPLE									
Total/NA	Analysis	Ra226_Ra228		1			451330	11/20/19 07:54	SMP	TAL SL
	Instrument ID: NOEQUIP									

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Lab Chronicle

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

Analyst References:

Lab: TAL PIT

Batch Type: Prep

MWW = Margaret Wanyoike

Batch Type: Analysis

AVS = Abbey Smith
MJH = Matthew Hartman
PM = Paloma Hoelzle
RSK = Robert Kurtz

Lab: TAL SL

Batch Type: Prep

ORM = Octavia Moore

Batch Type: Analysis

KLS = Kody Saulters
SCB = Sarah Bernsen
SMP = Siobhan Perry

Client Sample ID: CCR-SP-1

Date Collected: 10/15/19 13:35
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-1

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**4.6**		1.0	0.32	mg/L			11/08/19 15:46	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 15:46	1
Sulfate	**42**		1.0	0.38	mg/L			11/08/19 15:46	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0045**		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 19:07	1
Barium	**0.053**		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 19:07	1
Boron	**0.46**		0.080	0.039	mg/L		10/22/19 21:13	10/25/19 15:37	1
Calcium	**250**		0.50	0.13	mg/L		10/22/19 21:13	10/24/19 19:07	1
Chromium	**0.0017**	**J B**	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 19:07	1
Cobalt	**0.0067**		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 19:07	1
Lead	ND		0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 19:07	1
Lithium	**6.2**		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 15:37	1
Molybdenum	**0.0011**	**J**	0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 19:07	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2300**		20	20	mg/L			10/19/19 10:37	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**6.9**	**HF**	0.1	0.1	SU			10/29/19 16:48	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0158	U	0.0671	0.0672	1.00	0.125	pCi/L	10/25/19 14:07	11/18/19 07:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.1*		*40 - 110*	*10/25/19 14:07*	*11/18/19 07:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0447	U	0.218	0.218	1.00	0.385	pCi/L	10/25/19 15:47	11/05/19 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.1*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*
Y Carrier	*86.0*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0604	U	0.228	0.228	5.00	0.385	pCi/L		11/20/19 07:54	1

Client Sample ID: CCR-SP-2

Date Collected: 10/17/19 10:20
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-2

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	62		1.0	0.32	mg/L			11/13/19 15:24	1
Fluoride	0.27		0.10	0.026	mg/L			11/13/19 15:24	1
Sulfate	310		5.0	1.9	mg/L			11/13/19 15:40	5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0029		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 19:11	1
Barium	0.10		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 19:11	1
Boron	0.22		0.080	0.039	mg/L		10/22/19 21:13	10/25/19 15:40	1
Calcium	160		0.50	0.13	mg/L		10/22/19 21:13	10/24/19 19:11	1
Chromium	0.0016	J B	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 19:11	1
Cobalt	0.0011		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 19:11	1
Lead	0.00037	J	0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 19:11	1
Lithium	6.4		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 15:40	1
Molybdenum	0.0013	J	0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 19:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	980		10	10	mg/L			10/19/19 10:44	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			10/29/19 17:00	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0868	U	0.0917	0.0920	1.00	0.148	pCi/L	10/25/19 14:07	11/18/19 07:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.1*		*40 - 110*	*10/25/19 14:07*	*11/18/19 07:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.419	U	0.300	0.302	1.00	0.468	pCi/L	10/25/19 15:47	11/05/19 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.1*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*
Y Carrier	*86.7*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.506		0.314	0.316	5.00	0.468	pCi/L		11/20/19 07:54	1

Client Sample ID: CCR-SP-3
Lab Sample ID: 180-97469-3

Date Collected: 10/15/19 15:40
Matrix: Water
Date Received: 10/18/19 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.3		1.0	0.32	mg/L			11/08/19 16:49	1
Fluoride	0.21		0.10	0.026	mg/L			11/08/19 16:49	1
Sulfate	6.3		1.0	0.38	mg/L			11/08/19 16:49	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0058		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 19:14	1
Barium	0.074		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 19:14	1
Boron	0.040	J	0.080	0.039	mg/L		10/22/19 21:13	10/25/19 15:43	1
Calcium	84		0.50	0.13	mg/L		10/22/19 21:13	10/24/19 19:14	1
Chromium	0.0023	B	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 19:14	1
Cobalt	0.00075		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 19:14	1
Lead	0.00039	J	0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 19:14	1
Lithium	ND		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 15:43	1
Molybdenum	0.0028	J	0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 19:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	390		10	10	mg/L			10/19/19 10:37	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			10/29/19 16:58	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.101	U	0.0835	0.0840	1.00	0.126	pCi/L	10/25/19 14:07	11/18/19 07:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.4*		*40 - 110*	*10/25/19 14:07*	*11/18/19 07:23*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.215	U	0.255	0.256	1.00	0.421	pCi/L	10/25/19 15:47	11/05/19 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.4*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*
Y Carrier	*87.5*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.316	U	0.268	0.269	5.00	0.421	pCi/L		11/20/19 07:54	1

Client Sample ID: BLIND DUPLICATE 3

Date Collected: 10/15/19 00:00
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-4

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11		2.5	0.80	mg/L			11/08/19 17:21	2.5
Fluoride	ND		0.25	0.066	mg/L			11/08/19 17:21	2.5
Sulfate	110		2.5	0.95	mg/L			11/08/19 17:21	2.5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0047		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 19:24	1
Barium	0.053		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 19:24	1
Boron	0.47		0.080	0.039	mg/L		10/22/19 21:13	10/25/19 15:47	1
Calcium	250		0.50	0.13	mg/L		10/22/19 21:13	10/24/19 19:24	1
Chromium	0.0017	J B	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 19:24	1
Cobalt	0.0067		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 19:24	1
Lead	ND		0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 19:24	1
Lithium	5.4		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 15:47	1
Molybdenum	0.0012	J	0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 19:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		20	20	mg/L			10/19/19 10:37	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	HF	0.1	0.1	SU			10/29/19 16:56	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0435	U	0.0671	0.0672	1.00	0.115	pCi/L	10/25/19 14:07	11/18/19 07:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.6*		*40 - 110*	*10/25/19 14:07*	*11/18/19 07:22*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.398	U	0.263	0.266	1.00	0.402	pCi/L	10/25/19 15:47	11/05/19 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.6*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*
Y Carrier	*84.5*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.441		0.271	0.274	5.00	0.402	pCi/L		11/20/19 07:54	1

Client Sample ID: FIELD BLANK 3

Date Collected: 10/17/19 08:50
Date Received: 10/18/19 09:00

Lab Sample ID: 180-97469-5

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/11/19 00:12	1
Fluoride	**0.029**	**J**	0.10	0.026	mg/L			11/11/19 00:12	1
Sulfate	**0.70**	**J**	1.0	0.38	mg/L			11/11/19 00:12	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 19:28	1
Barium	ND		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 19:28	1
Boron	ND		0.080	0.039	mg/L		10/22/19 21:13	10/25/19 15:57	1
Calcium	**0.15**	**J**	0.50	0.13	mg/L		10/22/19 21:13	10/24/19 19:28	1
Chromium	**0.0016**	**J B**	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 19:28	1
Cobalt	ND		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 19:28	1
Lead	ND		0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 19:28	1
Lithium	ND		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 15:57	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 19:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			10/19/19 10:44	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.6**	**HF**	0.1	0.1	SU			10/29/19 16:52	1

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0721	U	0.0459	0.0463	1.00	0.126	pCi/L	10/25/19 14:07	11/18/19 09:14	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.5*		*40 - 110*	*10/25/19 14:07*	*11/18/19 09:14*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.284	U	0.260	0.261	1.00	0.418	pCi/L	10/25/19 15:47	11/05/19 12:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.5*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*
Y Carrier	*86.0*		*40 - 110*	*10/25/19 15:47*	*11/05/19 12:53*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.212	U	0.264	0.265	5.00	0.418	pCi/L		11/20/19 07:54	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-297483/45
Matrix: Water
Analysis Batch: 297483

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/08/19 20:46	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 20:46	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 20:46	1

Lab Sample ID: MB 180-297483/6
Matrix: Water
Analysis Batch: 297483

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/08/19 10:09	1
Fluoride	ND		0.10	0.026	mg/L			11/08/19 10:09	1
Sulfate	ND		1.0	0.38	mg/L			11/08/19 10:09	1

Lab Sample ID: LCS 180-297483/44
Matrix: Water
Analysis Batch: 297483

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.4		mg/L		95	80 - 120
Fluoride	2.50	2.37		mg/L		95	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

Lab Sample ID: LCS 180-297483/5
Matrix: Water
Analysis Batch: 297483

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	47.2		mg/L		94	80 - 120
Fluoride	2.50	2.26		mg/L		90	80 - 120
Sulfate	50.0	47.9		mg/L		96	80 - 120

Lab Sample ID: MB 180-297717/44
Matrix: Water
Analysis Batch: 297717

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/10/19 22:53	1
Fluoride	ND		0.10	0.026	mg/L			11/10/19 22:53	1
Sulfate	ND		1.0	0.38	mg/L			11/10/19 22:53	1

Lab Sample ID: LCS 180-297717/43
Matrix: Water
Analysis Batch: 297717

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.8		mg/L		103	80 - 120
Fluoride	1.25	1.22		mg/L		98	80 - 120
Sulfate	25.0	25.8		mg/L		103	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 180-298011/6
Matrix: Water
Analysis Batch: 298011

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/13/19 07:30	1
Fluoride	ND		0.10	0.026	mg/L			11/13/19 07:30	1
Sulfate	ND		1.0	0.38	mg/L			11/13/19 07:30	1

Lab Sample ID: LCS 180-298011/5
Matrix: Water
Analysis Batch: 298011

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	48.8		mg/L		98	80 - 120
Fluoride	2.50	2.34		mg/L		94	80 - 120
Sulfate	50.0	48.9		mg/L		98	80 - 120

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-295718/1-A
Matrix: Water
Analysis Batch: 296046

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 295718

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00032	mg/L		10/22/19 21:13	10/24/19 17:47	1
Barium	ND		0.010	0.0016	mg/L		10/22/19 21:13	10/24/19 17:47	1
Calcium	ND		0.50	0.13	mg/L		10/22/19 21:13	10/24/19 17:47	1
Chromium	0.00185	J	0.0020	0.0015	mg/L		10/22/19 21:13	10/24/19 17:47	1
Cobalt	ND		0.00050	0.000075	mg/L		10/22/19 21:13	10/24/19 17:47	1
Lead	ND		0.0010	0.00013	mg/L		10/22/19 21:13	10/24/19 17:47	1
Molybdenum	ND		0.0050	0.00061	mg/L		10/22/19 21:13	10/24/19 17:47	1

Lab Sample ID: MB 180-295718/1-A
Matrix: Water
Analysis Batch: 296189

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 295718

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.080	0.039	mg/L		10/22/19 21:13	10/25/19 14:36	1
Lithium	ND		5.0	3.4	ug/L		10/22/19 21:13	10/25/19 14:36	1

Lab Sample ID: LCS 180-295718/2-A
Matrix: Water
Analysis Batch: 296046

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 295718

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.954		mg/L		95	80 - 120
Barium	1.00	1.11		mg/L		111	80 - 120
Calcium	25.0	26.2		mg/L		105	80 - 120
Chromium	0.500	0.535		mg/L		107	80 - 120
Cobalt	0.500	0.491		mg/L		98	80 - 120
Lead	0.500	0.528		mg/L		106	80 - 120
Molybdenum	0.500	0.523		mg/L		105	80 - 120

Method: EPA 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 180-295718/2-A
Matrix: Water
Analysis Batch: 296189

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 295718

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.25	1.39		mg/L		112	80 - 120
Lithium	500	493		ug/L		99	80 - 120

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-296369/1
Matrix: Water
Analysis Batch: 296369

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 180-97469-5 DU
Matrix: Water
Analysis Batch: 296369

Client Sample ID: FIELD BLANK 3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	5.6	HF	5.6		SU		0.2	2

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-295452/2
Matrix: Water
Analysis Batch: 295452

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			10/19/19 10:37	1

Lab Sample ID: LCS 180-295452/1
Matrix: Water
Analysis Batch: 295452

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	188	222		mg/L		118	80 - 120

Lab Sample ID: 180-97469-3 DU
Matrix: Water
Analysis Batch: 295452

Client Sample ID: CCR-SP-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	390		387		mg/L		0	10

Lab Sample ID: MB 180-295454/2
Matrix: Water
Analysis Batch: 295454

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			10/19/19 10:44	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 180-295454/1
Matrix: Water
Analysis Batch: 295454

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	188	216		mg/L		115	80 - 120

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-447760/20-A
Matrix: Water
Analysis Batch: 450917

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447760

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.03534	U	0.0639	0.0640	1.00	0.141	pCi/L	10/25/19 16:22	11/18/19 09:15	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.8*		*40 - 110*	*10/25/19 16:22*	*11/18/19 09:15*	*1*

Lab Sample ID: LCS 160-447760/1-A
Matrix: Water
Analysis Batch: 450917

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 447760

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	9.647		1.01	1.00	0.132	pCi/L	85	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*87.7*		*40 - 110*

Lab Sample ID: LCSD 160-447760/2-A
Matrix: Water
Analysis Batch: 450917

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447760

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	10.84		1.12	1.00	0.126	pCi/L	96	75 - 125	0.56	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*87.4*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-447768/20-A
Matrix: Water
Analysis Batch: 449089

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447768

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2630	U	0.331	0.331	1.00	0.548	pCi/L	10/25/19 15:55	11/05/19 12:55	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-447768/20-A
Matrix: Water
Analysis Batch: 449089

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 447768

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		40 - 110	10/25/19 15:55	11/05/19 12:55	1
Y Carrier	81.1		40 - 110	10/25/19 15:55	11/05/19 12:55	1

Lab Sample ID: LCS 160-447768/1-A
Matrix: Water
Analysis Batch: 448789

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 447768

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.43	9.177		1.10	1.00	0.471	pCi/L	97	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	87.7		40 - 110
Y Carrier	85.6		40 - 110

Lab Sample ID: LCSD 160-447768/2-A
Matrix: Water
Analysis Batch: 448789

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 447768

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.43	11.29		1.30	1.00	0.470	pCi/L	120	75 - 125	0.88	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	87.4		40 - 110
Y Carrier	84.1		40 - 110

QC Association Summary

Client: Vectren Corporation
Project/Site: CCR Groundwater Monitoring AB Brown

Job ID: 180-97469-1

HPLC/IC

Analysis Batch: 297483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total/NA	Water	EPA 9056A	
180-97469-3	CCR-SP-3	Total/NA	Water	EPA 9056A	
180-97469-4	BLIND DUPLICATE 3	Total/NA	Water	EPA 9056A	
MB 180-297483/45	Method Blank	Total/NA	Water	EPA 9056A	
MB 180-297483/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297483/44	Lab Control Sample	Total/NA	Water	EPA 9056A	
LCS 180-297483/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Analysis Batch: 297717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-5	FIELD BLANK 3	Total/NA	Water	EPA 9056A	
MB 180-297717/44	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-297717/43	Lab Control Sample	Total/NA	Water	EPA 9056A	

Analysis Batch: 298011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
180-97469-2	CCR-SP-2	Total/NA	Water	EPA 9056A	
MB 180-298011/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-298011/5	Lab Control Sample	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 295718

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total Recoverable	Water	3005A	
180-97469-2	CCR-SP-2	Total Recoverable	Water	3005A	
180-97469-3	CCR-SP-3	Total Recoverable	Water	3005A	
180-97469-4	BLIND DUPLICATE 3	Total Recoverable	Water	3005A	
180-97469-5	FIELD BLANK 3	Total Recoverable	Water	3005A	
MB 180-295718/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-295718/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 296046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	295718
180-97469-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	295718
180-97469-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	295718
180-97469-4	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	295718
180-97469-5	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	295718
MB 180-295718/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	295718
LCS 180-295718/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	295718

Analysis Batch: 296189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total Recoverable	Water	EPA 6020A	295718
180-97469-2	CCR-SP-2	Total Recoverable	Water	EPA 6020A	295718
180-97469-3	CCR-SP-3	Total Recoverable	Water	EPA 6020A	295718
180-97469-4	BLIND DUPLICATE 3	Total Recoverable	Water	EPA 6020A	295718
180-97469-5	FIELD BLANK 3	Total Recoverable	Water	EPA 6020A	295718
MB 180-295718/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	295718

Metals (Continued)

Analysis Batch: 296189 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-295718/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	295718

General Chemistry

Analysis Batch: 295452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total/NA	Water	SM 2540C	
180-97469-3	CCR-SP-3	Total/NA	Water	SM 2540C	
180-97469-4	BLIND DUPLICATE 3	Total/NA	Water	SM 2540C	
MB 180-295452/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-295452/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-97469-3 DU	CCR-SP-3	Total/NA	Water	SM 2540C	

Analysis Batch: 295454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-2	CCR-SP-2	Total/NA	Water	SM 2540C	
180-97469-5	FIELD BLANK 3	Total/NA	Water	SM 2540C	
MB 180-295454/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-295454/1	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 296369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total/NA	Water	EPA 9040C	
180-97469-2	CCR-SP-2	Total/NA	Water	EPA 9040C	
180-97469-3	CCR-SP-3	Total/NA	Water	EPA 9040C	
180-97469-4	BLIND DUPLICATE 3	Total/NA	Water	EPA 9040C	
180-97469-5	FIELD BLANK 3	Total/NA	Water	EPA 9040C	
LCS 180-296369/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-97469-5 DU	FIELD BLANK 3	Total/NA	Water	EPA 9040C	

Rad

Prep Batch: 447760

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total/NA	Water	PrecSep-21	
180-97469-2	CCR-SP-2	Total/NA	Water	PrecSep-21	
180-97469-3	CCR-SP-3	Total/NA	Water	PrecSep-21	
180-97469-4	BLIND DUPLICATE 3	Total/NA	Water	PrecSep-21	
180-97469-5	FIELD BLANK 3	Total/NA	Water	PrecSep-21	
MB 160-447760/20-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-447760/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-447760/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 447768

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-97469-1	CCR-SP-1	Total/NA	Water	PrecSep_0	
180-97469-2	CCR-SP-2	Total/NA	Water	PrecSep_0	
180-97469-3	CCR-SP-3	Total/NA	Water	PrecSep_0	
180-97469-4	BLIND DUPLICATE 3	Total/NA	Water	PrecSep_0	
180-97469-5	FIELD BLANK 3	Total/NA	Water	PrecSep_0	
MB 160-447768/20-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-447768/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 447768 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 160-447768/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

TestAmerica Pittsburgh
301 Alpha Drive RIDC Park
Pittsburgh, PA 15238
Phone (412) 963-7058 Fax (412) 963-2468

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Jacob Winsett	Lab PM: Bortot, Veronica	Carrier Tracking No(s):	COC No: 180-49738-8017.1
Client Contact: Angela Casbon Scheller	Phone: (317)671-3730	E-Mail: veronica.bortot@testamericainc.com		Page: Page 1 of 1
Company: Vectren Corporation				Job #:

Address: PO BOX 209	Due Date Requested:
City: Evansville	TAT Requested (days): Standard
State, Zip: IN, 47702	
Phone: 864-214-8750(Tel)	PO #: Purchase Order Requested
Email: acscheller@Vectren.com	WO #:
Project Name: CCR Groundwater Monitoring - AB Brown	Project #: 18016014
Site: AB Brown	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226, 9320_Ra228	9040C, 9056A_ORGFM_28D	6020A, 7470A	2540C_Calcd - TDS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N	D	N		
~~CCR-AP-21~~ CCR-SP-1	10/15/19	1335	G	Water							5	Appendix III & Appendix IV
~~CCR-AP-01~~ CCR-SP-2	10/17/19	1020		Water								~~analytes needed: No Sb, Ve, Tl~~
~~CCR-AP-3~~ CCR-SP-3	10/15/19	1540		Water								Do Not Report:
~~CCR-AP-9~~ Blind Duplicate 3	10/15/19	—		Water								Mercury
~~CCR-AP-10~~ Field Blank 3	10/17/19	0850		Water								
~~CCR-AP-~~				~~Water~~								

180-97469 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☒ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Jacob Winsett	10/17/19 1900	ATC	Fedex Deliver Worker	10-18-19 9:00	TAPitt
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 08/04/2016

180-97469 Waybill

ns

Environment Testing
TestAmerica

01636

Uncorrected temp
Thermometer ID

°C

CF

Initials

PT-WI-SR-001 effective 11/8/18

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-97469-1

Login Number: 97469
List Number: 1
Creator: Watson, Debbie

List Source: Eurofins TestAmerica, Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	Requested analyses are not listed on COC
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Vectren Corporation

Job Number: 180-97469-1

Login Number: 97469
List Number: 2
Creator: Harris, Lorin C

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/22/19 01:50 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT 4

Statistical Analyses

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

MEMORANDUM

14 January 2019
File No. 129420

TO: Southern Indiana Gas and Electric Company

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Project Principal
Mark Miesfeldt, P.G., Lead Hydrogeologist

SUBJECT: Summary of 2018 Appendix IV Groundwater Monitoring
Results Pursuant to 40 CFR § 257.93 and 40 CFR § 257.95
A.B. Brown Generating Station

The Southern Indiana Gas and Electric Company (SIGECO) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR § 257 and 261) for the A.B. Brown Generating Station, located in Posey County near the community of West Franklin, Indiana. SIGECO provided Haley & Aldrich, Inc. with groundwater monitoring data collected from a groundwater monitoring system that meets the requirements of 40 CFR §257.91 and 40 CFR §257.93. This memorandum documents the results of statistical tests conducted to determine if Appendix IV groundwater monitoring constituents detected in downgradient wells are at levels that exhibit a statistically significant level (SSL) above groundwater protection standards consistent with the requirements in 40 CFR § 257.95.

Collection dates of groundwater samples from the CCR Unit from June 2018 through August 2018. The data satisfy the CCR Rule requirement of collecting 2 rounds of hydrological and groundwater quality data from the groundwater monitoring network. The groundwater protection standards (GWPS) and, if necessary, the confidence interval method statistical analysis were used to evaluate SSLs as specified in the certification statement of January 14, 2019.

GWPS, pursuant to 40 CFR § 257.95(d)(2) and in accordance with Phase I, Part 1 CCR Rule Revisions dated 17 July 2018, effective 16 August 2018, were generated for each Appendix IV constituent detected during assessment monitoring. The GWPS was set at the maximum contaminant level (MCL) or risk screening level (RSL) or set at the background concentration for each analyte based on a tolerance limit procedure. Analytical results from downgradient wells were compared to each respective GWPS. If a constituent is greater than the GWPS for that Unit, pursuant to 40 CFR § 257.93 (f)(5), the confidence interval method was used to evaluate if that Appendix IV constituent was present at a statistically significant level (SSL).

Based on the comparisons outlined above indicated the following SSLs:

Ash Pond: Molybdenum and lithium from one or more downgradient sample(s) indicated a statistically significant level.

Landfill: Lithium, cobalt and arsenic from one or more downgradient sample(s) indicated a statistically significant level.

Sedimentation Pond: Downgradient monitoring wells did not exhibit SSLs for Appendix IV constituents.

A.B. Brown Generating Station

Sedimentation Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: January 14, 2019

																		Inter-well Analysis							
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Mean**	**50th Percentile (Median)**	**95th Percentile**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**CCR MCL/RSL**	**Report Result Unit**	**Detection Exceedances (Y/N)**	**Number of Detection Exceedances**	**Outlier Detected**	**Outlier Removed**	**Trend**	**Distribution Group***	**June 2018 Concentrations (mg/L)**	**Detect?**	**Lower Confidence Limits**	**Upper Tolerance Limit (mg/L)**	**SSI**	**Background Limit (Higher of MCL/RSL or Upper Tolerance Limit)**	**[2]Exceedance above Background at Individual Well**	**SSL**
Appendix-IV: Antimony, Total (µg/L)																									
CCR-BK-1	2/10	80%	2-2	1.65	2	2	0.45	0.5512	0.7424	0.4498	6	µg/L	N	0	N	N	Stable	Non-parametric				0.002		0.006		
CCR-BK-2	1/10	90%	2-2	1.85	2	2	0.48	0.231	0.4807	0.2601	6	µg/L	N	0	N	N	Stable									
CCR-SP-1	0/10	100%	2-2	2	2	2		0	0	0	6	µg/L	N	0	N	N	NA		0.002	N			N		N	No
CCR-SP-2	0/10	100%	2-2	2	2	2		0	0	0	6	µg/L	N	0	N	N	NA		0.002	N			N		N	No
CCR-SP-3	0/10	100%	2-2	2	2	2		0	0	0	6	µg/L	N	0	N	N	NA		0.002	N			N		N	No
Appendix-IV: Arsenic, Total (µg/L)																									
CCR-BK-1	9/10	10%	1-1	1.01	0.975	2.05	2.5	0.4341	0.6588	0.6536	10	µg/L	N	0	N	N	Stable	Log-transformed				0.0033		0.010		
CCR-BK-2	6/11	45%	1-1	1.25	1	3.15	3.5	1.008	1.004	0.8036	10	µg/L	N	0	N	N	Stable									
CCR-SP-1	11/11	0%	-	5.65	5.1	9.7	13	6.497	2.549	0.4508	10	µg/L	N	0	Y	N	Stable		0.00460	Y			Y		N	No
CCR-SP-2	10/11	9%	1-1	1.54	1	4.65	7.7	4.423	2.103	1.367	10	µg/L	N	0	N	N	Stable		0.00071	Y			N		N	No
CCR-SP-3	11/11	0%	-	20.4	19	39	43	140	11.83	0.5793	10	µg/L	N	0	N	N	Stable		0.00480	Y			Y		N	No
Appendix-IV: Barium, Total (µg/L)																									
CCR-BK-1	11/11	0%	-	42.8	38	65.5	82	201	14.18	0.3311	2000	µg/L	N	0	Y	N	Stable	Non-parametric				0.150		2.000		
CCR-BK-2	11/11	0%	-	47.8	36	99	150	1176	34.3	0.7172	2000	µg/L	N	0	Y	N	Stable									
CCR-SP-1	11/11	0%	-	90.1	87	110	120	195.5	13.98	0.1552	2000	µg/L	N	0	N	N	Stable		0.081	Y			N		N	No
CCR-SP-2	11/11	0%	-	117	120	140	140	469	21.66	0.1854	2000	µg/L	N	0	N	N	Increase		0.130	Y			N		N	No
CCR-SP-3	11/11	0%	-	74.5	72	94	110	156.1	12.49	0.1676	2000	µg/L	N	0	Y	N	Stable		0.067	Y			N		N	No
Appendix-IV: Beryllium, Total (µg/L)																									
CCR-BK-1	1/10	90%	1-1	0.912	1	1	0.12	0.07744	0.2783	0.3051	4	µg/L	N	0	N	N	Stable	Non-parametric				0.001		0.004		
CCR-BK-2	2/10	80%	1-1	0.858	1	1	0.4	0.09231	0.3038	0.3541	4	µg/L	N	0	N	N	Stable									
CCR-SP-1	0/10	100%	1-1	1	1	1		0	0	0	4	µg/L	N	0	N	N	NA		0.001	N			N		N	No
CCR-SP-2	0/10	100%	1-1	1	1	1		0	0	0	4	µg/L	N	0	N	N	NA		0.001	N			N		N	No
CCR-SP-3	1/10	90%	1-1	0.929	1	1	0.29	0.05041	0.2245	0.2417	4	µg/L	N	0	N	N	Stable		0.001	N			N		N	No
Appendix-IV: Cadmium, Total (µg/L)																									
CCR-BK-1	0/11	100%	1-1	1	1	1		0	0	0	5	µg/L	N	0	N	N	Stable	Non-parametric				0.001		0.005		
CCR-BK-2	0/11	100%	1-1	1	1	1		0	0	0	5	µg/L	N	0	N	N	Stable									
CCR-SP-1	0/10	100%	1-1	1	1	1		0	0	0	5	µg/L	N	0	N	N	NA		0.001	N			N		N	No
CCR-SP-2	2/10	80%	1-1	0.821	1	1	0.11	0.1427	0.3778	0.4603	5	µg/L	N	0	N	N	Stable		0.001	N			N		N	No
CCR-SP-3	1/10	90%	1-1	0.915	1	1	0.15	0.07225	0.2688	0.2938	5	µg/L	N	0	N	N	Stable		0.001	N			N		N	No
Appendix-IV: Chromium, Total (µg/L)																									
CCR-BK-1	10/10	0%	-	2.53	2.55	5.53	7.6	4.103	2.026	0.7994	100	µg/L	N	0	Y	N	Increase	Log-transformed				0.007		0.100		
CCR-BK-2	3/10	70%	2-2	2.38	2	4.52	4.7	1.412	1.188	0.5	100	µg/L	N	0	N	N	Stable									
CCR-SP-1	0/10	100%	1.7-2	1.97	2	2		0.009	0.09487	0.04816	100	µg/L	N	0	N	N	NA		0.0011	Y			N		N	No
CCR-SP-2	4/10	60%	2-2.1	1.64	2	2.055	1.4	0.297	0.545	0.3329	100	µg/L	N	0	N	N	Stable		0.0014	Y			N		N	No
CCR-SP-3	1/10	90%	2-2.2	2.78	2	6.27	9.6	5.746	2.397	0.8623	100	µg/L	N	0	Y	N	Stable		0.0013	Y			N		N	No
Appendix-IV: Cobalt, Total (µg/L)																									
CCR-BK-1	9/10	10%	0.5-0.5	1.13	0.9	2.53	2.8	0.584	0.7642	0.6769	6	µg/L	N	0	N	N	Stable	Log-transformed				0.0042		0.006		
CCR-BK-2	6/11	45%	0.5-0.5	1.06	0.5	3.85	6.2	3.098	1.76	1.656	6	µg/L	N	1	N	N	Stable									
CCR-SP-1	11/11	0%	-	3.79	3.1	7.15	7.2	2.857	1.69	0.4459	6	µg/L	Y	2	Y	N	Stable		0.00710	Y			Y		Y	Yes
CCR-SP-2	11/11	0%	-	0.841	0.83	1.3	1.4	0.09173	0.3029	0.3602	6	µg/L	N	0	N	N	Stable		0.00065	Y			N		N	No
CCR-SP-3	11/11	0%	-	1.18	0.79	3.25	5.4	2	1.414	1.203	6	µg/L	N	0	Y	N	Decrease		0.00079	Y			N		N	No
Appendix-IV: Fluoride (µg/L)																									
CCR-BK-1	10/10	0%	-	333	335	375.5	380	934.4	30.57	0.0918	4000	µg/L	N	0	N	N	Stable	Non-parametric				0.380		4.000		
CCR-BK-2	9/9	0%	-	150	140	184	200	525	22.91	0.1528	4000	µg/L	N	0	N	N	Stable									
CCR-SP-1	10/10	0%	-	310	270	555	780	27930	167.1	0.5391	4000	µg/L	N	0	Y	N	Stable		0.21	Y			N		N	No
CCR-SP-2	11/11	0%	-	346	340	380	380	645.5	25.41	0.07335	4000	µg/L	N	0	N	N	Stable		0.37	Y			N		N	No
CCR-SP-3	11/11	0%	-	361	380	410	410	2569	50.69	0.1404	4000	µg/L	N	0	N	N	Stable		0.30	Y			N		N	No
Appendix-IV: Lead, Total (µg/L)																									
CCR-BK-1	10/11	9%	1-1	0.654	0.8	1.05	1.1	0.1383	0.3719	0.5686	15	µg/L	N	0	N	N	Stable	Non-parametric				0.011		0.015		
CCR-BK-2	5/11	55%	1-1	2.07	1	6.9	11	9.368	3.061	1.477	15	µg/L	N	0	Y	N	Stable									
CCR-SP-1	1/10	90%	1-1	0.91	1	1	0.097	0.08154	0.2856	0.3139	15	µg/L	N	0	N	N	Stable		0.00010	Y			N		N	No
CCR-SP-2	7/10	30%	1-1	0.724	0.855	1	0.97	0.1098	0.3314	0.4577	15	µg/L	N	0	N	N	Stable		0.00019	Y			N		N	No
CCR-SP-3	4/10	60%	1-1	1.25	1	3.805	6.1	3.059	1.749	1.394	15	µg/L	N	0	Y	N	Stable		0.00020	Y			N		N	No
Appendix-IV: Lithium, Total (µg/L)																									
CCR-BK-1	3/11	73%	50-50	37.9	50	50	8.6	430.2	20.74	0.5471	40	µg/L	N	0	N	N	Stable	Non-parametric				0.050		0.050		
CCR-BK-2	0/11	100%	5-50	45.9	50	50		184.1	13.57	0.2955	40	µg/L	N	0	N	N	Stable									
CCR-SP-1	1/11	91%	6.4-50	42	50	50	5.1	320.5	17.9	0.4267	40	µg/L	N	0	Y	N	Stable		0.0051	Y			N		N	No
CCR-SP-2	2/11	82%	7.3-50	38.7	50	50	11	378.6	19.46	0.5034	40	µg/L	N	0	N	N	Stable		0.0069	Y			N		N	No
CCR-SP-3	1/11	91%	5-50	41.6	50	50	3.1	345.7	18.59	0.4464	40	µg/L	N	0	Y	N	Stable		0.0031	Y			N		N	No
Appendix-IV: Molybdenum, Total (µg/L)																									
CCR-BK-1	8/10	20%	5-5	2.58	2.1	5	3.4	2.06	1.435	0.5562	100	µg/L	N	0	N	N	Stable	Non-parametric				0.005		0.100		
CCR-BK-2	4/11	64%	5-5	3.5	5	5	1.7	4.418	2.102	0.6004	100	µg/L	N	0	N	N	Stable									
CCR-SP-1	10/11	9%	5-5	1.86	1.5	3.55	2.1	1.165	1.079	0.5791	100	µg/L	N	0	Y	N	Stable		0.0013	Y			N		N	No

A.B. Brown Generating Station

Sedimentation Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: January 14, 2019

																	Inter-well Analysis							
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Mean**	**50th Percentile (Median)**	**95th Percentile**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**CCR MCL/RSL**	**Report Result Unit**	**Detection Exceedances (Y/N)**	**Number of Detection Exceedances**	**Outlier Detected**	**Outlier Removed**	**Trend**	**Distribution Group***	**June 2018 Concentrations (mg/L)**	**Detect?**	**Lower Confidence Limits**	**Upper Tolerance Limit (mg/L)**	**SSI**	**Background Limit (Higher of MCL/RSL or Upper Tolerance Limit)**	**[2]Exceedance above Background at Individual Well**	**SSL**
CCR-SP-2	9/11	18%	5-5	2	1.4	5	1.6	2.222	1.491	0.7453	100	µg/L	N	0	Y	N	Stable		0.0012	Y			N		N	No
CCR-SP-3	10/11	9%	5-5	4.61	5	5.95	6.2	1.487	1.219	0.2646	100	µg/L	N	0	N	N	Stable		0.0027	Y			N		N	No
Appendix-IV: Radium-226 & 228 (µg/L)																										
CCR-BK-1	5/8	38%	0.366-0.907	0.512	0.4695	0.7831	0.553	0.02935	0.1713	0.3347	5	µg/L	N	0	Y	N	Stable	Non-parametric				5.0		5.000		
CCR-BK-2	3/10	70%	0.356-5	3.18	4.065	5	3.13	4.295	2.072	0.6525	5	µg/L	N	0	N	N	Stable									
CCR-SP-1	5/9	44%	0.46-5	1.48	0.511	5	0.525	3.983	1.996	1.348	5	µg/L	N	0	N	N	Stable		0.047	Y			N		N	No
CCR-SP-2	5/9	44%	0.376-5	1.14	0.647	3.364	0.91	2.141	1.463	1.286	5	µg/L	N	0	Y	N	Stable		0.579	Y			N		N	No
CCR-SP-3	2/10	80%	0.384-5	2.32	0.779	5	0.449	5.336	2.31	0.9939	5	µg/L	N	0	N	N	Stable		0.121	Y			N		N	No
Appendix-IV: Selenium, Total (µg/L)																										
CCR-BK-1	3/11	73%	5-5	3.78	5	5	0.67	4.39	2.095	0.5547	50	µg/L	N	0	N	N	Stable	Non-parametric				0.005		0.050		
CCR-BK-2	2/11	82%	5-5	4.22	5	5	0.98	3.004	1.733	0.4104	50	µg/L	N	0	Y	N	Stable									
CCR-SP-1	1/10	90%	5-5	4.54	5	5	0.36	2.153	1.467	0.3235	50	µg/L	N	0	N	N	Stable		0.005	N			N		N	No
CCR-SP-2	1/10	90%	5-5	4.56	5	5	0.63	1.91	1.382	0.3029	50	µg/L	N	0	N	N	Stable		0.005	N			N		N	No
CCR-SP-3	1/10	90%	5-5	4.54	5	5	0.42	2.098	1.448	0.3189	50	µg/L	N	0	N	N	Stable		0.005	N			N		N	No
Appendix-IV: Thallium, Total (µg/L)																										
CCR-BK-1	1/10	90%	1-1	0.904	1	1	0.038	0.09254	0.3042	0.3366	2	µg/L	N	0	N	N	Stable	Non-parametric				0.001		0.002		
CCR-BK-2	1/10	90%	1-1	0.906	1	1	0.059	0.08855	0.2976	0.3285	2	µg/L	N	0	N	N	Stable									
CCR-SP-1	2/10	80%	1-1	0.812	1	1	0.093	0.1575	0.3969	0.4888	2	µg/L	N	0	N	N	Stable		0.0010	N			N		N	No
CCR-SP-2	1/10	90%	1-1	0.905	1	1	0.049	0.09044	0.3007	0.3323	2	µg/L	N	0	N	N	Stable		0.0010	N			N		N	No
CCR-SP-3	2/10	80%	1-1	0.816	1	1	0.14	0.1506	0.388	0.4753	2	µg/L	N	0	N	N	Stable		0.0010	N			N		N	No

µg/L - micrograms per liter

N/A - Not available

NT- Not tested

A.B. Brown Generating Station

Sedimentation Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: January 14, 2019

																		Inter-well Analysis							
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Mean**	**50th Percentile (Median)**	**95th Percentile**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**CCR MCL/RSL**	**Report Result Unit**	**Detection Exceedances (Y/N)**	**Number of Detection Exceedances**	**Outlier Detected**	**Outlier Removed**	**Trend**	**Distribution Group***	**August 2018 Concentrations (mg/L)**	**Detect?**	**Lower Confidence Limits**	**Upper Tolerance Limit (mg/L)**	**SSI**	**Background Limit (Higher of MCL/RSL or Upper Tolerance Limit)**	**[2]Exceedance above Background at Individual Well**	**SSL**
Appendix-IV: Arsenic, Total (µg/L)																									
CCR-BK-1	9/10	10%	1-1	1.01	0.975	2.05	2.5	0.4341	0.6588	0.6536	10	µg/L	N	0	N	N	Stable	Log-transformed				0.0033		0.010		
CCR-BK-2	6/11	45%	1-1	1.25	1	3.15	3.5	1.008	1.004	0.8036	10	µg/L	N	0	N	N	Stable									
CCR-SP-1	11/11	0%	-	5.65	5.1	9.7	13	6.497	2.549	0.4508	10	µg/L	N	0	Y	N	Stable		0.00450	Y			Y		N	No
CCR-SP-2	10/11	9%	1-1	1.54	1	4.65	7.7	4.423	2.103	1.367	10	µg/L	N	0	N	N	Stable		0.00064	Y			N		N	No
CCR-SP-3	11/11	0%	-	20.4	19	39	43	140	11.83	0.5793	10	µg/L	N	0	N	N	Stable		0.00390	Y			Y		N	No
Appendix-IV: Barium, Total (µg/L)																									
CCR-BK-1	11/11	0%	-	42.8	38	65.5	82	201	14.18	0.3311	2000	µg/L	N	0	Y	N	Stable	Non-parametric				0.150		2.000		
CCR-BK-2	11/11	0%	-	47.8	36	99	150	1176	34.3	0.7172	2000	µg/L	N	0	Y	N	Stable									
CCR-SP-1	11/11	0%	-	90.1	87	110	120	195.5	13.98	0.1552	2000	µg/L	N	0	N	N	Stable		0.066	Y			N		N	No
CCR-SP-2	11/11	0%	-	117	120	140	140	469	21.66	0.1854	2000	µg/L	N	0	N	N	Increase		0.120	Y			N		N	No
CCR-SP-3	11/11	0%	-	74.5	72	94	110	156.1	12.49	0.1676	2000	µg/L	N	0	Y	N	Stable		0.068	Y			N		N	No
Appendix-IV: Chromium, Total (µg/L)																									
CCR-BK-1	10/10	0%	-	2.53	2.55	5.53	7.6	4.103	2.026	0.7994	100	µg/L	N	0	Y	N	Increase	Log-transformed				0.007		0.100		
CCR-BK-2	3/10	70%	2-2	2.38	2	4.52	4.7	1.412	1.188	0.5	100	µg/L	N	0	N	N	Stable									
CCR-SP-1	0/10	100%	1.7-2	1.97	2	2		0.009	0.09487	0.04816	100	µg/L	N	0	N	N	NA		0.0017	Y			N		N	No
CCR-SP-2	4/10	60%	2-2.1	1.64	2	2.055	1.4	0.297	0.545	0.3329	100	µg/L	N	0	N	N	Stable		0.0021	Y			N		N	No
CCR-SP-3	1/10	90%	2-2.2	2.78	2	6.27	9.6	5.746	2.397	0.8623	100	µg/L	N	0	Y	N	Stable		0.0022	Y			N		N	No
Appendix-IV: Cobalt, Total (µg/L)																									
CCR-BK-1	9/10	10%	0.5-0.5	1.13	0.9	2.53	2.8	0.584	0.7642	0.6769	6	µg/L	N	0	N	N	Stable	Log-transformed				0.0042		0.006		
CCR-BK-2	6/11	45%	0.5-0.5	1.06	0.5	3.85	6.2	3.098	1.76	1.656	6	µg/L	N	1	N	N	Stable									
CCR-SP-1	11/11	0%	-	3.79	3.1	7.15	7.2	2.857	1.69	0.4459	6	µg/L	Y	2	Y	N	Stable		0.00720	Y			Y		Y	Yes
CCR-SP-2	11/11	0%	-	0.841	0.83	1.3	1.4	0.09173	0.3029	0.3602	6	µg/L	N	0	N	N	Stable		0.00072	Y			N		N	No
CCR-SP-3	11/11	0%	-	1.18	0.79	3.25	5.4	2	1.414	1.203	6	µg/L	N	0	Y	N	Decrease		0.00046	Y			N		N	No
Appendix-IV: Fluoride (µg/L)																									
CCR-BK-1	10/10	0%	-	333	335	375.5	380	934.4	30.57	0.0918	4000	µg/L	N	0	N	N	Stable	Non-parametric				0.380		4.000		
CCR-BK-2	9/9	0%	-	150	140	184	200	525	22.91	0.1528	4000	µg/L	N	0	N	N	Stable									
CCR-SP-1	10/10	0%	-	310	270	555	780	27930	167.1	0.5391	4000	µg/L	N	0	Y	N	Stable		0.78	Y			Y		N	No
CCR-SP-2	11/11	0%	-	346	340	380	380	645.5	25.41	0.07335	4000	µg/L	N	0	N	N	Stable		0.32	Y			N		N	No
CCR-SP-3	11/11	0%	-	361	380	410	410	2569	50.69	0.1404	4000	µg/L	N	0	N	N	Stable		0.25	Y			N		N	No
Appendix-IV: Lead, Total (µg/L)																									
CCR-BK-1	10/11	9%	1-1	0.654	0.8	1.05	1.1	0.1383	0.3719	0.5686	15	µg/L	N	0	N	N	Stable	Non-parametric				0.011		0.015		
CCR-BK-2	5/11	55%	1-1	2.07	1	6.9	11	9.368	3.061	1.477	15	µg/L	N	0	Y	N	Stable									
CCR-SP-1	1/10	90%	1-1	0.91	1	1	0.097	0.08154	0.2856	0.3139	15	µg/L	N	0	N	N	Stable		0.00100	N			N		N	No
CCR-SP-2	7/10	30%	1-1	0.724	0.855	1	0.97	0.1098	0.3314	0.4577	15	µg/L	N	0	N	N	Stable		0.00026	Y			N		N	No
CCR-SP-3	4/10	60%	1-1	1.25	1	3.805	6.1	3.059	1.749	1.394	15	µg/L	N	0	Y	N	Stable		0.00012	Y			N		N	No
Appendix-IV: Lithium, Total (µg/L)																									
CCR-BK-1	3/11	73%	50-50	37.9	50	50	8.6	430.2	20.74	0.5471	40	µg/L	N	0	N	N	Stable	Non-parametric				0.050		0.050		
CCR-BK-2	0/11	100%	5-50	45.9	50	50		184.1	13.57	0.2955	40	µg/L	N	0	N	N	Stable									
CCR-SP-1	1/11	91%	6.4-50	42	50	50	5.1	320.5	17.9	0.4267	40	µg/L	N	0	Y	N	Stable		0.0064	Y			N		N	No
CCR-SP-2	2/11	82%	7.3-50	38.7	50	50	11	378.6	19.46	0.5034	40	µg/L	N	0	N	N	Stable		0.0073	Y			N		N	No
CCR-SP-3	1/11	91%	5-50	41.6	50	50	3.1	345.7	18.59	0.4464	40	µg/L	N	0	Y	N	Stable		0.0034	Y			N		N	No
Appendix-IV: Molybdenum, Total (µg/L)																									
CCR-BK-1	8/10	20%	5-5	2.58	2.1	5	3.4	2.06	1.435	0.5562	100	µg/L	N	0	N	N	Stable	Non-parametric				0.005		0.100		
CCR-BK-2	4/11	64%	5-5	3.5	5	5	1.7	4.418	2.102	0.6004	100	µg/L	N	0	N	N	Stable									
CCR-SP-1	10/11	9%	5-5	1.86	1.5	3.55	2.1	1.165	1.079	0.5791	100	µg/L	N	0	Y	N	Stable		0.0011	Y			N		N	No
CCR-SP-2	9/11	18%	5-5	2	1.4	5	1.6	2.222	1.491	0.7453	100	µg/L	N	0	Y	N	Stable		0.0012	Y			N		N	No
CCR-SP-3	10/11	9%	5-5	4.61	5	5.95	6.2	1.487	1.219	0.2646	100	µg/L	N	0	N	N	Stable		0.0027	Y			N		N	No
Appendix-IV: Radium-226 & 228 (µg/L)																									
CCR-BK-1	5/8	38%	0.366-0.907	0.512	0.4695	0.7831	0.553	0.02935	0.1713	0.3347	5	µg/L	N	0	Y	N	Stable	Non-parametric				5.0		5.000		
CCR-BK-2	3/10	70%	0.356-5	3.18	4.065	5	3.13	4.295	2.072	0.6525	5	µg/L	N	0	N	N	Stable									
CCR-SP-1	5/9	44%	0.46-5	1.48	0.511	5	0.525	3.983	1.996	1.348	5	µg/L	N	0	N	N	Stable		0.737	Y			N		N	No
CCR-SP-2	5/9	44%	0.376-5	1.14	0.647	3.364	0.91	2.141	1.463	1.286	5	µg/L	N	0	Y	N	Stable		1.420	Y			N		N	No
CCR-SP-3	2/10	80%	0.384-5	2.32	0.779	5	0.449	5.336	2.31	0.9939	5	µg/L	N	0	N	N	Stable		0.483	Y			N		N	No

µg/L - micrograms per liter

N/A - Not available

NT- Not tested

HALEY & ALDRICH, INC.
400 Augusta Street
Suite 130
Greenville, SC 29601
864.214.8750

21 November 2019
File No. 129420

TO: Southern Indiana Gas and Electric Company (SIGECO)

FROM: Haley & Aldrich, Inc.
[Steven F. Putrich, P.E., Project Principal
Mark Miesfeldt, P.G., Lead Hydrogeologist]

SUBJECT: Notification of Statistically Significant Levels of Appendix IV Constituents
Pursuant to 40 CFR§ 257.95(g) and 40 CFR § 257.105(h)(8)
A.B. Brown Generating Station - Sedimentation Pond - West Franklin, Indiana

Southern Indiana Gas and Electric Company (SIGECO) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR § 257 and 261) for the A.B. Brown Generating Station, in Posey County near West Franklin, Indiana. Detection monitoring events occurred in 2016 and 2017. The results of the sampling events were compared to background using appropriate statistical methods to determine if Appendix III constituents were present at concentrations above background. The result of the statistical analysis identified a statistically significant increase (SSI) downgradient of the Sedimentation Pond thereby triggering Assessment Monitoring and respective notification of the same.

During the Assessment Monitoring phase, groundwater samples were collected from the downgradient monitoring wells. Samples were collected in June, and August 2018 and analyzed for the Appendix III and Appendix IV constituents as required by 40 CFR §257.95(b) and 40 CFR §257.95(d)(1). Concurrent with the second assessment sampling round, and as required by 40 CFR §257.95(h), groundwater protection standards (GWPS) were established for the detected Appendix IV constituents. The assessment monitoring sampling results were compared to the GWPS and statistically significant levels (SSLs) of Appendix IV constituents were not identified downgradient of the Sedimentation Pond at that time.

As required by 40 CFR § 257.95(b) and 40 CFR § 257.95(d)(1), semiannual groundwater sampling and analysis continued for the Sedimentation Pond. The first round of semiannual groundwater sampling was conducted in May 2019 but due to laboratory turn-around issues associated with the radium analyses this sampling round was not completed until the end of August 2019.

For the Sedimentation Pond, which continued in Assessment Monitoring in 2019, a statistical analysis of the May 2019 analytical results from downgradient wells were compared to each respective GWPS. If the detected constituent was greater than the GWPS for that Unit, pursuant to 40 CFR § 257.93 (f)(5), the confidence interval method was used to evaluate if that Appendix IV constituent was present at a statistically significant level. Based on the comparisons outlined above, the results of the statistical

analyses conducted for those detected Appendix IV constituents confirm that Appendix IV constituents are not present at SSLs above GWPSs downgradient of the Sedimentation Pond.

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A.B. Brown Generating Station

Sedimentation Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: November 15, 2019

																			Inter-well Analysis					
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Mean**	**50th Percentile (Median)**	**95th Percentile**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**CCR MCL/RSL**	**Report Result Unit**	**Detection Exceedances (Y/N)**	**Number of Detection Exceedances**	**Number of Non-Detection Exceedances**	**Outlier Detected**	**Outlier Removed**	**Trend**	**Distribution Group***	**Distribution Well***	**May 2019 Concentration (mg/L)**	**Lower Confidence Limit (LCL) (mg/L)**	**Upper Tolerance Limit (mg/L)**	**Background Limit (Higher of MCL/RSL or Upper Tolerance Limit) mg/L**	**Exceedance above Background at Individual Well**	**SSL**
CCR Appendix-IV: Antimony, Total (mg/L)																									
CCR-BK-1	2/11	82%	0.002-0.002	0.00168	0.002	0.002	0.00045	5.072E-07	0.0007122	0.4233	0.006	mg/L	N	0	0	Y	N	NA	Non-parametric	Non-parametric			0.002	0.006		
CCR-BK-2	1/11	91%	0.002-0.002	0.00186	0.002	0.002	0.00048	0.00000021	0.0004583	0.2462	0.006	mg/L	N	0	0	N	N	NA		Non-parametric						
CCR-SP-1	0/11	100%	0.002-0.002	0.002	0.002	0.002		0	0	0	0.006	mg/L	N	0	0	NA	NA	NA		NA	0.002				N	No
CCR-SP-2	0/11	100%	0.002-0.002	0.002	0.002	0.002		0	0	0	0.006	mg/L	N	0	0	NA	NA	NA		NA	0.002				N	No
CCR-SP-3	0/11	100%	0.002-0.002	0.002	0.002	0.002		0	0	0	0.006	mg/L	N	0	0	NA	NA	NA		NA	0.002				N	No
CCR Appendix-IV: Arsenic, Total (mg/L)																									
CCR-BK-1	10/11	9%	0.001-0.001	0.000947	0.00095	0.002	0.0025	4.312E-07	0.0006567	0.6932	0.01	mg/L	N	0	0	N	N	Stable	Log-transformed	Normal			0.003	0.01		
CCR-BK-2	7/12	42%	0.001-0.001	0.00118	0.001	0.003115	0.0035	9.747E-07	0.0009873	0.8373	0.01	mg/L	N	0	0	Y	N	Stable		Non-parametric						
CCR-SP-1	12/12	0%	-	0.00548	0.00485	0.00937	0.013	0.000006258	0.002502	0.4562	0.01	mg/L	Y	1	0	Y	N	Stable		Non-parametric	0.0036				N	No
CCR-SP-2	11/12	8%	0.001-0.001	0.00153	0.00115	0.004345	0.0077	0.000004023	0.002006	1.314	0.01	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.0014				N	No
CCR-SP-3	12/12	0%	-	0.0189	0.018	0.0386	0.043	0.0001565	0.01251	0.6631	0.01	mg/L	Y	9	0	N	N	Decrease		Normal	0.0017				N	No
CCR Appendix-IV: Barium, Total (mg/L)																									
CCR-BK-1	12/12	0%	-	0.0415	0.038	0.06385	0.082	0.0002035	0.01427	0.3438	2	mg/L	N	0	0	Y	N	Stable	Non-parametric	Non-parametric			0.150	2.0		
CCR-BK-2	12/12	0%	-	0.0476	0.0365	0.0939	0.15	0.00107	0.03271	0.6874	2	mg/L	N	0	0	Y	N	Stable		Non-parametric						
CCR-SP-1	12/12	0%	-	0.09	0.088	0.109	0.12	0.0001778	0.01333	0.1482	2	mg/L	N	0	0	N	N	Stable		Normal	0.089				N	No
CCR-SP-2	12/12	0%	-	0.117	0.12	0.14	0.14	0.0004272	0.02067	0.1765	2	mg/L	N	0	0	N	N	Stable		Normal	0.12				N	No
CCR-SP-3	12/12	0%	-	0.0731	0.0705	0.0924	0.11	0.0001675	0.01294	0.1771	2	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.057				N	No
CCR Appendix-IV: Beryllium, Total (mg/L)																									
CCR-BK-1	1/11	91%	0.001-0.001	0.00092	0.001	0.001	0.00012	7.04E-08	0.0002653	0.2884	0.004	mg/L	N	0	0	N	N	NA	Non-parametric	Non-parametric			0.001	0.004		
CCR-BK-2	2/11	82%	0.001-0.001	0.000871	0.001	0.001	0.0004	8.491E-08	0.0002914	0.3346	0.004	mg/L	N	0	0	Y	N	NA		Non-parametric						
CCR-SP-1	0/11	100%	0.001-0.001	0.001	0.001	0.001		0	0	0	0.004	mg/L	N	0	0	NA	NA	NA		NA	0.001				N	No
CCR-SP-2	0/11	100%	0.001-0.001	0.001	0.001	0.001		0	0	0	0.004	mg/L	N	0	0	NA	NA	NA		NA	0.001				N	No
CCR-SP-3	1/11	91%	0.001-0.001	0.000935	0.001	0.001	0.00029	4.583E-08	0.0002141	0.2288	0.004	mg/L	N	0	0	N	N	Stable		Non-parametric	0.001				N	No
CCR Appendix-IV: Cadmium, Total (mg/L)																									
CCR-BK-1	0/12	100%	0.001-0.001	0.001	0.001	0.001		0	0	0	0.005	mg/L	N	0	0	NA	NA	NA	Non-parametric	Non-parametric			0.001	0.005		
CCR-BK-2	0/12	100%	0.001-0.001	0.001	0.001	0.001		0	0	0	0.005	mg/L	N	0	0	NA	NA	NA		Non-parametric						
CCR-SP-1	0/11	100%	0.001-0.001	0.001	0.001	0.001		0	0	0	0.005	mg/L	N	0	0	N	N	NA		NA	0.001				N	No
CCR-SP-2	2/11	82%	0.001-0.001	0.000837	0.001	0.001	0.00011	1.314E-07	0.0003625	0.433	0.005	mg/L	N	0	0	N	N	Stable		Non-parametric	0.001				N	No
CCR-SP-3	1/11	91%	0.001-0.001	0.000923	0.001	0.001	0.00015	6.568E-08	0.0002563	0.2777	0.005	mg/L	N	0	0	N	N	Stable		Non-parametric	0.001				N	No
CCR Appendix-IV: Chromium, Total (mg/L)																									
CCR-BK-1	10/11	9%	0.002-0.002	0.00249	0.0025	0.0053	0.0076	0.000003719	0.001928	0.7759	0.1	mg/L	N	0	0	Y	N	Stable	Log-transformed	Non-parametric			0.007	0.1		
CCR-BK-2	4/11	64%	0.002-0.002	0.00295	0.002	0.0067	0.0087	0.000004906	0.002215	0.7506	0.1	mg/L	N	0	0	N	N	Stable		Non-parametric						
CCR-SP-1	0/11	100%	0.0017-0.002	0.00197	0.002	0.002		8.182E-09	0.00009045	0.04585	0.1	mg/L	N	0	0	Y	N	NA		Non-parametric	0.002				N	No
CCR-SP-2	5/11	55%	0.002-0.0021	0.00167	0.002	0.00205	0.002	2.793E-07	0.0005285	0.3165	0.1	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.002				N	No
CCR-SP-3	1/11	91%	0.002-0.0022	0.00271	0.002	0.0059	0.0096	0.000005227	0.002286	0.8439	0.1	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.002				N	No
CCR Appendix-IV: Cobalt, Total (mg/L)																									
CCR-BK-1	10/11	9%	0.0005-0.0005	0.00104	0.0008	0.0025	0.0028	6.181E-07	0.0007862	0.758	0.006	mg/L	N	0	0	N	N	Stable	Log-transformed	Log-transformed			0.004	0.006		
CCR-BK-2	7/12	42%	0.0005-0.0005	0.00102	0.0005	0.003615	0.0062	0.000002843	0.001686	1.659	0.006	mg/L	N	0	0	N	N	Stable		Log-transformed						
CCR-SP-1	12/12	0%	-	0.00412	0.00315	0.00747	0.0078	0.000003937	0.001984	0.481	0.006	mg/L	Y	2	0	Y	N	Stable		Non-parametric	0.0078	0.0026			N	No
CCR-SP-2	12/12	0%	-	0.000946	0.000835	0.001715	0.0021	2.155E-07	0.0004642	0.4908	0.006	mg/L	N	0	0	N	N	Stable		Normal	0.0021				N	No
CCR-SP-3	12/12	0%	-	0.0011	0.000755	0.003035	0.0054	0.000001888	0.001374	1.25	0.006	mg/L	N	0	0	Y	N	Decrease		Non-parametric	0.00026				N	No
CCR Appendix-IV: Fluoride (mg/L)																									
CCR-BK-1	10/11	9%	0.23-0.23	1.296	1.28	1.518	1.52	0.006876	0.16588	0.5124	4	mg/L	N	0	0	Y	N	Stable	Non-parametric	Non-parametric			0.380	4.0		
CCR-BK-2	9/10	10%	0.12-0.12	0.588	0.56	0.8	0.8	0.0021096	0.09184	0.6248	4	mg/L	N	0	0	N	N	Decrease		Normal						
CCR-SP-1	10/11	9%	0.2-0.2	1.2	1.08	3.02	3.12	0.09996	0.6324	2.1076	4	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.2				N	No
CCR-SP-2	12/12	0%	-	1.376	1.36	1.52	1.52	0.0024668	0.09932	0.2886	4	mg/L	N	0	0	N	N	Stable		Normal	0.32				N	No
CCR-SP-3	11/12	8%	0.25-0.25	1.408	1.52	1.64	1.64	0.012856	0.2268	0.6448	4	mg/L	N	0	0	N	N	Stable		Non-parametric	0.25				N	No
CCR Appendix-IV: Lead, Total (mg/L)																									
CCR-BK-1	11/12	8%	0.001-0.001	0.000613	0.000715	0.001045	0.0011	1.461E-07	0.0003822	0.6236	0.015	mg/L	N	0	0	N	N	Stable	Non-parametric	Normal			0.011	0.015		
CCR-BK-2	5/12	58%	0.001-0.001	0.00198	0.001	0.00649	0.011	0.000008612	0.002935	1.48	0.015	mg/L	N	0	0	Y	N	Stable		Non-parametric						
CCR-SP-1	2/11	82%	0.001-0.001	0.000845	0.001	0.001	0.0002	1.192E-07	0.0003452	0.4085	0.015	mg/L	N	0	0	N	N	Stable		Non-parametric	0.0002				N	No
CCR-SP-2	8/11	27%	0.001-0.001	0.000736	0.00086	0.001	0.00097	1.005E-07	0.000317	0.4305	0.015	mg/L	N	0	0	N	N	Stable		Normal	0.00086				N	No
CCR-SP-3	5/11	55%	0.001-0.001	0.00115	0.001	0.00355	0.0061	0.000002864	0.001692	1.466	0.015	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.00015				N	No
CCR Appendix-IV: Lithium, Total (mg/L)																									
CCR-BK-1	3/12	75%	0.0065-0.05	0.0353	0.05	0.05	0.0086	0.0004733	0.02176	0.6164	0.04	mg/L	N	0	0	N	N	NA	Non-parametric	Non-parametric			0.050	0.05		
CCR-BK-2	0/12	100%	0.005-0.05	0.0429	0.05	0.05		0.0002778	0.01667	0.3888	0.04	mg/L	N	0	0	NA	NA	NA		Non-parametric						
CCR-SP-1	2/12	83%	0.0064-0.05	0.039	0.05	0.05	0.0059	0.0003997	0.01999	0.5133	0.04	mg/L	N	0	0	N	N	Stable		Non-parametric	0.0059				N	No
CCR-SP-2	3/12	75%	0.0073-0.05	0.036	0.05	0.05	0.011	0.0004277	0.02068	0.5742	0.04	mg/L	N	0	0	N	N	Stable		Non-parametric	0.007				N	No
CCR-SP-3	2/12	83%	0.005-0.05	0.0385	0.05	0.05	0.004	0.0004324	0.02079	0.54	0.04	mg/L	N	0	0	N	N	Stable		Non-parametric	0.004				N	No
CCR Appendix-IV: Mercury, Total (mg/L)																									
CCR-BK-1	0/12	100%	0.0002-0.0002	0.0002	0.0002	0.0002		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA	Non-parametric	NA			0.0002	0.002		
CCR-BK-2	1/12	92%	0.0002-0.0002	0.000192	0.0002	0.0002	0.0001	8.333E-10	0.00002887	0.1506	0.002	mg/L	N	0	0	NA	NA	NA		NA						
CCR-SP-1	0/11	100%	0.0002-0.0002	0.0002	0.0002	0.0002		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		NA	0.0002				N	No
CCR-SP-2	0/11	100%	0.0002-0.0002	0.0002	0.0002	0.0002		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		NA	0.0002				N	No
CCR-SP-3	0/11	100%	0.0002-0.0002	0.0002	0.0002	0.0002		0	0	0	0.002	mg/L	N	0	0	NA	NA	NA		NA	0.0002				N	No
CCR Appendix-IV: Molybdenum, Total (mg/L)																									

A.B. Brown Generating Station

Sedimentation Pond

Assessment Monitoring Statistical Analysis Summary

Prepared: November 15, 2019

CCR-BK-1	9/11	18%	0.005-0.005	0.0024	0.0017	0.005	0.0034	0.000002199	0.001483	0.6172	0.1	mg/L	N	0	0	N	N	Decrease	Non-parametric	Normal			0.005	0.1		
CCR-BK-2	5/12	58%	0.005-0.005	0.00342	0.005	0.005	0.0025	0.0000041	0.002025	0.5925	0.1	mg/L	N	0	0	N	N	Stable		Non-parametric						
CCR-SP-1	11/12	8%	0.005-0.005	0.00181	0.00145	0.003405	0.0021	0.000001095	0.001047	0.5788	0.1	mg/L	N	0	0	N	N	Stable		Non-parametric	0.0012				N	No
CCR-SP-2	10/12	17%	0.005-0.005	0.00195	0.0014	0.005	0.0016	0.00000205	0.001432	0.7342	0.1	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.0014				N	No
CCR-SP-3	11/12	8%	0.005-0.005	0.00436	0.005	0.005925	0.0062	0.000002106	0.001451	0.333	0.1	mg/L	N	0	0	N	N	Stable		Normal	0.0016				N	No
CCR Appendix-IV: Radium-226 & 228 (mg/L)																										
CCR-BK-1	8/12	33%	0.366-5	0.899	0.484	2.749	0.795	1.695	1.302	1.448	5	pCi/L	N	0	0	N	N	Increase	Non-parametric	Normal			5.0	5.0		
CCR-BK-2	4/12	67%	0.356-5	3.09	4.065	5	3.13	4.552	2.134	0.6905	5	pCi/L	N	0	0	N	N	Stable		Normal						
CCR-SP-1	7/12	42%	0.46-5	1.64	0.5195	5	0.737	4.114	2.028	1.237	5	pCi/L	N	0	0	N	N	Stable		Non-parametric	5				N	No
CCR-SP-2	8/12	33%	0.376-5	1.1	0.767	3.031	1.42	1.594	1.262	1.148	5	pCi/L	N	0	0	Y	N	Stable		Normal	0.578				N	No
CCR-SP-3	3/12	75%	0.384-5	2.39	0.779	5	0.483	5.319	2.306	0.9635	5	pCi/L	N	0	0	N	N	Stable		Non-parametric	5				N	No
CCR Appendix-IV: Selenium, Total (mg/L)																										
CCR-BK-1	3/12	75%	0.005-0.005	0.00388	0.005	0.005	0.00067	0.000004116	0.002029	0.523	0.05	mg/L	N	0	0	N	N	NA	Non-parametric	Non-parametric			0.005	0.05		
CCR-BK-2	2/12	83%	0.005-0.005	0.00429	0.005	0.005	0.00098	0.000002781	0.001668	0.3889	0.05	mg/L	N	0	0	Y	N	NA		Non-parametric						
CCR-SP-1	1/11	91%	0.005-0.005	0.00458	0.005	0.005	0.00036	0.000001957	0.001399	0.3056	0.05	mg/L	N	0	0	N	N	Stable		Non-parametric	0.005				N	No
CCR-SP-2	1/11	91%	0.005-0.005	0.0046	0.005	0.005	0.00063	0.000001736	0.001318	0.2863	0.05	mg/L	N	0	0	N	N	Stable		Non-parametric	0.005				N	No
CCR-SP-3	1/11	91%	0.005-0.005	0.00458	0.005	0.005	0.00042	0.000001907	0.001381	0.3013	0.05	mg/L	N	0	0	N	N	Stable		Non-parametric	0.005				N	No
CCR Appendix-IV: Thallium, Total (mg/L)																										
CCR-BK-1	1/11	91%	0.001-0.001	0.000913	0.001	0.001	0.000038	8.413E-08	0.0002901	0.3179	0.002	mg/L	N	0	0	N	N	NA	Non-parametric	Non-parametric			0.001	0.002		
CCR-BK-2	1/11	91%	0.001-0.001	0.000914	0.001	0.001	0.000059	8.05E-08	0.0002837	0.3103	0.002	mg/L	N	0	0	N	N	NA		Non-parametric						
CCR-SP-1	2/11	82%	0.001-0.001	0.000829	0.001	0.001	0.000093	0.000000145	0.0003807	0.4593	0.002	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.001				N	No
CCR-SP-2	1/11	91%	0.001-0.001	0.000914	0.001	0.001	0.000049	8.222E-08	0.0002867	0.3139	0.002	mg/L	N	0	0	N	N	Stable		Non-parametric	0.001				N	No
CCR-SP-3	2/11	82%	0.001-0.001	0.000833	0.001	0.001	0.00014	1.386E-07	0.0003723	0.4468	0.002	mg/L	N	0	0	Y	N	Stable		Non-parametric	0.001				N	No