2018-2019 Annual Groundwater Monitoring and Corrective Action Report - Primary 2
NIPSCO Michigan City Generating Station

Prepared Pursuant to 40 CFR §257.90(e) and Corresponding Regulations under 329 Indiana Administrative Code 10-9-1

Submitted to:

Northern Indiana Public Service Company

Michigan City Generating Station
Michigan City, Indiana

Submitted by:

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Table of Contents

1.0 INTRODUCTION

On behalf of Northern Indiana Public Service Company (NIPSCO), Golder Associates Inc. (Golder) prepared this 2018-2019 CCR Annual Groundwater Monitoring and Corrective Action Report (2018-2019 Annual Report) for the surface impoundment referred to as Primary Settling Pond 2 or Primary 2 (P2, the CCR Unit) located at the Michigan City Generating Station (MCGS), 101 Wabash Street, Michigan City, La Porte County, Indiana (Latitude 41° 43' 15" N and Longitude 86° 54' 30" W, see Figure 1). P2 is an approximately 2.7-acre unlined impoundment, as shown in Figure 2.

Golder prepared the 2018-2019 Annual Report in accordance with 40 Code of Federal Regulations (CFR) Part 257, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule" (CCR Final Rule) and corresponding regulations under 329 Indiana Administrative Code (IAC) 10-9-1. P2 is subject to the October 4, 2016 extended compliance deadline of 547 days, and therefore the first annual groundwater monitoring and corrective action report must be completed by August 1, 2019.

Routine monitoring activities performed during the reporting period include inspection of wells for integrity and security, measurement of groundwater levels prior to sample collection to assess groundwater flow direction, and collection of groundwater samples for laboratory analysis.

In conformance with the applicable requirements of 40 CFR §257.90(e)(1) through (5) and corresponding State of Indiana requirements, the 2019 Annual Report:

- Documents the status of the groundwater monitoring and corrective action program
- Provides figures showing the CCR Unit and monitoring well locations
- Summarizes key CCR groundwater activities completed between June 2016 and July 2019
- Includes CCR groundwater monitoring data obtained between June 2016 and July 2019
- Describes any problems encountered during the monitoring activities
- Discusses actions taken to resolve the problems, if applicable
- Projects key activities for the upcoming year

Although the CCR Final Rule (specifically 40 CFR §257.90(e)) states an annual report must provide information only for the preceding calendar year, NIPSCO's consultant, Golder conducted certain activities (e.g., installed monitoring wells) and collected data (e.g., initiated background sampling) relevant to the CCR groundwater monitoring program prior to 2019. Therefore, in the interest in providing a complete data package and summary of the monitoring program, Golder is including CCR Final Rule-related information collected in calendar years 2016, 2017, 2018, and 2019 in this first (i.e., 2018-2019) annual report.

2.0 GROUNDWATER MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

Starting in 2016 following the installation of a groundwater monitoring system and throughout calendar years 2017 and 2018, Golder collected background groundwater samples pursuant to the requirements of 40 CFR §257.94 and corresponding State of Indiana requirements. In April 2019, Golder performed the first Detection Monitoring sampling event. Based upon groundwater monitoring results collected pursuant to the CCR Final Rule to date, corrective action program requirements have neither been triggered nor implemented at this CCR Unit.

2.1 Key Actions Completed – June 2016-July 2019

NIPSCO completed the following key actions relative to CCR groundwater monitoring at P2 between June 2016 and July 2019:

- Design, construction, and development of background and downgradient monitoring wells consistent with NIPSCO written specifications and standard operating procedures (40 CFR §257.91)
- Certification of the groundwater monitoring system by a qualified professional engineer (40 CFR §257.91(f))
- Development of a groundwater sampling program including identification of statistical method(s) appropriate to the data set(s) and site conditions (40 CFR §257.91)
- Certification of the selection of appropriate statistical method(s) by a qualified professional engineer (40 CFR §257.93(f)(6))
- Collection of a minimum of eight independent background groundwater samples for Appendix III and Appendix IV constituents from each background and downgradient monitoring well (40 CFR §257.94(b))
- Performance of the first Detection Monitoring event in April 2019 (40 CFR §257.94)
- Evaluation of the results of the first Detection Monitoring event in July 2019 (40 CFR §257.94)

2.2 Monitoring System Modification

Consistent with the requirements of 40 CFR §257.90 and 257.91, NIPSCO designed, constructed, and developed a groundwater monitoring system for P2. As shown in Table 1, NIPSCO identified four existing monitoring wells (GAMW-05, GAMW-08, GAMW-09, and GMMW-1- installed as part of an ongoing RCRA Corrective Action groundwater program) that are appropriately located and constructed to serve as CCR Rule-compliant monitoring wells. To complete the monitoring system as per CCR Final Rule interpretations, Golder installed seven additional wells in June 2016. As shown in Figure 2 and summarized in the table below, the groundwater monitoring network for this CCR unit consists of three background wells and eight downgradient wells. NIPSCO obtained certification from a qualified professional engineer stating that the groundwater monitoring system was designed and constructed to meet the requirements of 40 CFR §257.91. Table 1 provides a summary of the well rationale/purpose and date of installation. An overview of the groundwater monitoring network is provided below.

CCR Unit	Background Monitoring Wells	Downgradient Monitoring Wells
Primary 2	GAMW-05*, GAMW-12, GAMW-18	GAMW-08*, GAMW-09*, GAMW-13, GAMW-14, GAMW-15, GAMW-16, GAMW-17, GMMW-1*

*Existing monitoring well

2.3 Background Monitoring (2016 to 2018)

Per the requirements of 40 CFR §257.94, Golder collected eleven independent background groundwater samples from each background and downgradient well between July 2016 and October 2018 at intervals of at least 49 days to account for both seasonal and spatial variability in groundwater quality. Golder used the results of the background monitoring phase to develop appropriate, statistically valid background values for each constituent/monitoring well. Golder submitted the samples to a contract laboratory, in accordance with chain of custody and quality assurance/quality control procedures, for analysis of 40 CFR Part 257 Appendix III and Appendix IV constituents. In addition, Golder personnel measured field water quality parameters including specific conductance, temperature, dissolved oxygen, turbidity, oxidation-reduction potential, and pH. Information including sampling dates, number of groundwater samples collected for each background and downgradient well, and the purpose of sampling is described in Table 2. All analytical results are provided in Table 3.

2.4 Detection Monitoring

Golder performed the first Detection Monitoring event in April 2019, followed by a statistical evaluation and data analysis in July 2019. Golder collected groundwater samples from the P2 background and downgradient monitoring wells for analysis of Appendix III constituents per 40 CFR §257.94 and included the results in Table 3. Following receipt and validation of laboratory results, Golder evaluated the results of the first Detection Monitoring sampling event to compare the concentrations of Appendix III constituents relative to facility background concentrations. Using Sanitas™ software, Golder pooled the background data to calculate prediction limits and compared the April 2019 results to the calculated prediction limits to determine statistically significant increases (SSIs). The SSIs are summarized in the table below by downgradient monitoring well and constituent.

Monitoring Well ID	Boron	Calcium	Chloride	Fluoride	Sulfate	pH[1]	Total Dissolved Solids
GAMW-08						X	
GAMW-09	X					X	
GAMW-13						X	
GAMW-14						X	
GAWM-15	X					X	
GAMW-16	X					X	
GAWM-17						X	
GMMW-1	X			X		X	

“X” represents an SSI
1 = pH value is based on field water quality meter reading

2.5 Statistical Evaluation

Subsequent to each monitoring event, Golder assessed the analytical data for outliers, anomalies, and trends that may be an indication of a sampling or analytical error. Outliers and anomalies are generally defined as inconsistently large or small values that can occur as a result of sampling, laboratory, transportation, or transcription errors, or even by chance alone. Significant trends may indicate natural geochemical variability, a source of systematic error, influence of an upgradient/off-site source, or an actual occurrence of CCR Unit influence. Appropriate statistical methods are used to remove outliers from the database and manage trends with detrending routines, prior to the calculation of statistical limits. To assess the data for outliers, anomalies, and trends, Golder assessed the data using time vs. concentration graphs, and statistical routines included in the Sanitas™ statistical analysis software package.

Golder identified the July 2016 beryllium and cadmium results from background monitoring well GAMW-12 as outliers and removed these data from the background data set for the following reasons:

- Trend charts indicated that the beryllium and cadmium results from the July 2016 monitoring event were inconsistent with concentrations detected in other background monitoring wells; and
- These results were recorded by the validators as non-detect due to blank contamination.

Golder identified the July 2016 thallium results from background monitoring wells GAMW-12 and GAMW-18 as outliers and removed these data from the background data set for the following reasons:

- Trend charts indicated that these thallium results were inconsistent with concentrations detected in other background monitoring wells; and
- These thallium results were recorded by the validators as non-detect due to blank contamination.

Golder identified the January 2017 pH result from background monitoring well GAMW-18 as an outlier and removed this datum from the background data set for the following reason:

- Trend charts indicated that this pH result was inconsistent with concentrations detected in other background monitoring wells.

Golder identified the March 2017 antimony result from background monitoring well GAMW-05 as an outlier and removed this datum from the background data set for the following reason:

- Trend charts indicated that the antimony result was inconsistent with concentrations detected in other background monitoring wells.

Golder identified the March 2017 barium result from background monitoring well GAMW-18 as an outlier and removed this datum from the background data set for the following reason:

- Trend charts indicated that the barium result was inconsistent with concentrations detected in other background monitoring wells.

Golder identified the March 2017 lithium result from background monitoring well GAMW-18 as an outlier and removed this datum from the background data set for the following reasons:

- Trend charts indicated that the lithium result was inconsistent with concentrations detected in other background monitoring wells; and
- This lithium result is the only non-detect result detected in the background wells.

Golder identified the April 2019 cobalt, lithium, pH, sulfate, and total dissolved solid results from background monitoring well GAMW-12 as outliers and removed these data from the background data set for the following reason:

- Trend charts indicated that the cobalt, lithium, pH, sulfate, and total dissolved solid results were inconsistent with concentrations detected in other background monitoring wells.

Golder evaluated the background data for trends using Sanitas™ software. Golder will continue to monitor trends and will perform detrending routines before using these data to calculate Groundwater Protection Standards (GWPS):

- Fluoride concentrations detected in groundwater samples collected from well GAMW-12 show a decreasing trend; and

- Molybdenum concentrations detected in groundwater samples collected from well GAMW-12 show a decreasing trend.

2.6 Problems Encountered and Follow-Up Corrective Actions

No problems were encountered.

3.0 KEY ACTIVITIES PROJECTED FOR 2019

From August 2019 to July 2020, NIPSCO anticipates conducting the following key CCR groundwater monitoring activities for P2:

- Prepare and submit the appropriate notifications according to the CCR Final Rule;
- Complete semi-annual groundwater sampling per CCR requirements; and
- Inspect and maintain the monitoring system including wells, pumps, and equipment.

TABLES

Table 1: Monitoring Well Network
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

CCR Unit	Well Purpose	Monitoring Well ID	Installation Date (If Applicable)	Decommission Date (If Applicable)	Basis For Action
Primary 2	Background Monitoring Well	GAMW-05	-	-	Installed for Groundwater Quality Monitoring*
		GAMW-12	6/14/2016	-	
		GAMW-18	6/14/2016	-	
	Downgradient Monitoring Well	GAMW-08	-	-	
		GAMW-09	-	-	
		GAMW-13	6/13/2016	-	
		GAMW-14	6/13/2016	-	
		GAMW-15	6/13/2016	-	
		GAMW-16	6/13/2016	-	
		GAMW-17	6/10/2016	-	
		GMMW-1	-	-	

* Per the CCR Rule requirements, Golder collected eight rounds of background data prior to April 17, 2019.

Prepared by: DFS
Checked by: ANB
Reviewed by: MAH

Table 2: Summary of Sampling Events
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Well Purpose	Monitoring Well ID	Sample Event #1	Sample Event #2	Sample Event #3	Sample Event #4	Sample Event #5	Sample Event #6	Sample Event #7	Sample Event #8	Sample Event #9	Sample Event #10	Sample Event #11	Sample Event #12	Sample Event #13	Total Number of Samples
Purpose of Sample		Background Monitoring												Detection Monitoring	
Sample Parameters		Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III and Appendix IV	Appendix III	Appendix III and Appendix IV	Detected Appendix IV	Appendix III and Appendix IV	Appendix III	
Background Monitoring Well	GAMW-05	7/19/2016	9/13/2016	11/16/2016	1/16/2017	3/7/2017	5/2/2017	7/5/2017	8/29/2017	10/9/2017	4/17/2018		10/4/2018	10/9/2017	12
	GAMW-12	7/18/2016	9/13/2016	11/16/2016	1/17/2017	3/7/2017	5/2/2017	7/5/2017	8/29/2017	10/9/2017	4/17/2018		10/4/2018	10/9/2017	12
	GAMW-18	7/18/2016	9/13/2016	11/16/2016	1/16/2017	3/7/2017	5/2/2017	7/5/2017	8/29/2017	10/9/2017	4/17/2018		10/4/2018	10/9/2017	12
Downgradient Monitoring Well	GAMW-08	7/19/2016	9/13/2016	11/16/2016	1/17/2017	3/8/2017	5/2/2017	7/5/2017	8/29/2017		4/17/2018	5/8/2018	10/3/2018	10/9/2017	12
	GAMW-09	7/19/2016	9/13/2016	11/16/2016	1/17/2017	3/8/2017	5/2/2017	7/5/2017	8/29/2017		4/17/2018	5/8/2018	10/3/2018	10/9/2017	12
	GAMW-13	7/18/2016	9/13/2016	11/16/2016	1/17/2017	3/8/2017	5/2/2017	7/5/2017	8/29/2017		4/16/2018	5/7/2018	10/2/2018	10/9/2017	12
	GAMW-14	7/18/2016	9/12/2016	11/16/2016	1/17/2017	3/8/2017	5/2/2017	7/5/2017	8/29/2017		4/16/2018	5/7/2018	10/2/2018	10/9/2017	12
	GAMW-15	7/18/2016	9/12/2016	11/16/2016	1/17/2017	3/8/2017	5/2/2017	7/5/2017	8/29/2017		4/16/2018	5/7/2018	10/2/2018	10/9/2017	12
	GAMW-16	7/18/2016	9/13/2016	11/16/2016	1/17/2017	3/7/2017	5/2/2017	7/5/2017	8/29/2017		4/17/2018	5/8/2018	10/2/2018	10/9/2017	12
	GAMW-17	7/18/2016	9/13/2016	11/16/2016	1/17/2017	3/7/2017	5/2/2017	7/5/2017	8/29/2017		4/17/2018	5/8/2018	10/3/2018	10/9/2017	12
	GMMW-1	7/19/2016	9/13/2016	11/17/2016	1/17/2017	3/7/2017	5/3/2017	7/5/2017	8/29/2017		4/17/2018	5/7/2018	10/2/2018	10/9/2017	12
Total Number of Samples		11	11	11	11	11	11	11	11	3	11	8	11	11	132

Notes:
Sample counts do not include QC/QA samples.

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Reviewed by: MAH

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-05												
		2016-07-19	2016-09-13	2016-09-13	2016-11-16	2017-01-16	2017-03-07	2017-05-02	2017-07-05	2017-08-29	2017-10-09	2018-04-17	2018-10-04	2019-04-02
		N	FD	N	N	N	N	N	N	N	N	N	N	N
Appendix III Parameters														
Boron	mg/L	1.1	1.1	1.1	1.2	1.3	1.2 J+	1.1	0.84	0.93	0.8	0.79	0.7	0.47
Calcium	mg/L	260	180	190	310	320	250	400	360	310	310	330	310	170
Chloride	mg/L	350	310	300	270	450	540	340	300	320	420	340	180	280
Fluoride	mg/L	0.42 J	1.1	1.5 J	0.87 J	0.89 J-	0.89 J	20 U	0.61 J	0.73 J	0.73 J	0.8 J	0.49 J+	0.97
pH	SU	7.09		6.43	6.89	6.71	6.77	6.45	6.87	6.54	6.28	6.85	6.45	6.8
Sulfate	mg/L	1900	1700	1700	1200	1500 J-	1100	1500	960	860	1000 J-	1300	1100	760
Total Dissolved Solids	mg/L	3500	3400 J	780 J	2500	3200	2800	3000	2000	2300	2600	2500	1900 J+	1600
Appendix IV Parameters														
Antimony	mg/L	0.002 U	0.002 U	0.00036 J	0.00033 J	0.00072 J	0.0012 JO	0.002 U	0.002 U	0.002 U			0.002 U	0.002 U
Arsenic	mg/L	0.0011 J	0.0034 J	0.0038 J	0.002 J	0.0029 J	0.0029 J	0.0014 J	0.00078 J	0.005 U			0.0012 J	0.005 U
Barium	mg/L	0.046	0.043	0.045	0.038	0.044	0.036	0.041	0.031	0.034			0.023	0.052
Beryllium	mg/L	0.00015 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.00087 J	0.001 U
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Chromium	mg/L	0.002 U	0.00031 J	0.00027 J	0.002 U	0.002 U	0.00031 J	0.002 U	0.002 U	0.002 U			0.002 U	0.002 U
Cobalt	mg/L	5.4E-05 J	0.001 U	0.001 U	0.001 U	0.001 U	0.00015 J	0.001 U	0.001 U	0.001 U			0.00075 J	0.001 U
Fluoride	mg/L	0.42 J	1.1	1.5 J	0.87 J	0.89 J-	0.89 J	20 U	0.61 J	0.73 J	0.73 J	0.8 J	0.49 J+	0.97
Lead	mg/L	0.001 U	0.0024 J+	0.001 U	0.001 U	0.001 U	0.00037 J	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Lithium	mg/L	0.039	0.051	0.051	0.044	0.05	0.04	0.04	0.028	0.023			0.022	0.041
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U			0.0002 U	0.0002 U
Molybdenum	mg/L	0.00057 J	0.01 U	0.00073 J	0.01 U	0.01 U	0.00089 J	0.01 U	0.01 U	0.01 U			0.01 U	0.01 U
Radium 226 + 228	pCi/L	1.12	0.931	0.917	0.785	0.745	1.04	1.04	0.292 U	0.703 J+			0.95 J+	
Radium-226	pCi/L	0.268	0.465	0.557	0.422	0.33 U	0.204	0.435	0.185 J+	0.211 J			0.689 J+	
Radium-228	pCi/L	0.847	0.503 U	0.562 U	0.485 U	0.512	0.837	0.607	0.292 U	0.491 J+			0.4 U	
Selenium	mg/L	0.0014 J	0.005 U	0.00053 J	0.005 U	0.0011 J	0.001 J	0.005 U	0.005 U	0.005 U			0.0035 J	0.005 U
Thallium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Field Parameters														
Dissolved Oxygen	mg/L	0.25		0.66	0.25	0.15	0.13	0.64	0.74	0.01	2.65	0.26	0.31	1.51
Oxidation-Reduction Potential	millivolts	-108.9		-22.2	-125.2	-128.8	-127.1	-98.5	-83.6	13.7	-37.1	-144.3	-98.9	-104.9
pH	SU	7.09		6.43	6.89	6.71	6.77	6.45	6.87	6.54	6.28	6.85	6.45	6.8
Specific Conductance	uS/cm	3569		3734	3098	3369	4401	3226	2843	2920	3321	3952	2251	1847
Temperature	deg C	15.96		17.3	17.09	15.2	15.19	13.96	16.07	17.26	17.23	6.81	17.3	12.8
Turbidity	NTU	2.5		3.16	2.74	4.9	4.75	3.96	2.27	1.49	0.79	4.22	0.73	2.52

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
"J" = Indicates the result was estimated.
"J+" = Indicates the result was estimated and may be biased high.
"J-" = Indicates the result was estimated and may be biased low.
"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-08															
		2016-07-19	2016-09-13	2016-11-16	2017-01-17	2017-01-17	2017-03-08	2017-05-02	2017-07-05	2017-07-05	2017-08-29	2018-04-17	2018-05-08	2018-05-08	2018-10-03	2019-04-04	2019-04-04
		N	N	N	FD	N	N	N	FD	N	N	N	FD	N	N	FD	N
Appendix III Parameters																	
Boron	mg/L	2.6	3	2.5	2.4	2.4	2	1.9	2.3	2.4	3.8	1.4			3.2	2.8 J	5.3 J
Calcium	mg/L	73	63	58	73	73	77	87	99	100	110	68			45	73	95
Chloride	mg/L	70	64	59	62	61	63	70	67	67	72	74			85	79	85
Fluoride	mg/L	2.4	2.1	1.5	1.7 J-	1.6 J-	1.7 J	1.4 J	1.5 J	1.9 J	2.2 J	0.6 J	1.4 J	1.4 J	2.3	1.4	2.9
pH	SU	10.46	9.86	12.19		10.5	10.43	10.76		10.8	10.96	9.43		9.14	8.56		9.65
Sulfate	mg/L	220	170	150	160 J-	160 J-	190	200	260	260	310	220			170	170 J	270 J
Total Dissolved Solids	mg/L	480	430	390	410	420	460	450	550	550	720	480			410	540	580
Appendix IV Parameters																	
Antimony	mg/L	0.001 J	0.0017 J	0.002	0.00084 J	0.001 J	0.00066 J	0.00079 J	0.00092 J	0.00094 J	0.0015 J	0.0021	0.0016 J	0.0018 J	0.00091 J		
Arsenic	mg/L	0.021	0.025	0.025	0.021	0.021	0.014	0.016	0.018	0.018	0.021	0.02	0.021	0.02	0.03		
Barium	mg/L	0.019	0.015	0.013	0.014	0.014	0.013	0.015	0.022	0.022	0.029	0.021	0.022	0.02	0.021		
Beryllium	mg/L	5.5E-05 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		
Chromium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.002 U		
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00024 J		0.001 U		
Fluoride	mg/L	2.4	2.1	1.5	1.7 J-	1.6 J-	1.7 J	1.4 J	1.5 J	1.9 J	2.2 J	0.6 J	1.4 J	1.4 J	2.3	1.4	2.9
Lead	mg/L	0.00011 J	0.0032 J+	0.001 U	0.001 U	0.001 U	0.00017 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U		
Lithium	mg/L	0.0035 J	0.0042 J	0.0026 J	0.008 U	0.008 U	0.0014 J	0.0028 J	0.0024 J	0.0024 J	0.008 U	0.008 U	0.008 U		0.016		
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U			0.0002 U		
Molybdenum	mg/L	0.048	0.039	0.03	0.028	0.029	0.028	0.029	0.062	0.064	0.074	0.041	0.042	0.04	0.038		
Radium 226 + 228	pCi/L	0.367 U	0.502 U	0.469 U	0.584 U	0.588 U	0.518	0.49 U	0.362 U	0.302 U	0.366 UJ	0.366 U					
Radium-226	pCi/L	0.186 U	0.112 U	0.38 U	0.311 U	0.304 U	0.126 U	0.103 U	0.139 J+	0.0847 U	0.0541 UJ	0.0803 U					
Radium-228	pCi/L	0.367 U	0.502 U	0.469 U	0.584 U	0.588 U	0.444 U	0.49 U	0.362 U	0.302 U	0.366 UJ	0.366 U					
Selenium	mg/L	0.0021 J	0.0032 J	0.0031 J	0.002 J	0.0019 J	0.0024 J	0.004 J	0.0045 J	0.0037 J	0.0019 J	0.0026 J	0.0025 J	0.0024 J	0.0012 J		
Thallium	mg/L	8.9E-05 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00044 J	0.00039 J	0.00044 J	0.001		
Field Parameters																	
Dissolved Oxygen	mg/L	0.23	1.18	0.17		0.59	0.14	0.15		2.02	0.03	1.02		0.96	0.46		1.4
Oxidation-Reduction Potential	millivolts	-26	83.4	-139.4		31.2	-90.6	-281.4		104.2	28.5	-172.9		-335.6	35.8		136.9
pH	SU	10.46	9.86	12.19		10.5	10.43	10.76		10.8	10.96	9.43		9.14	8.56		9.65
Specific Conductance	uS/cm	601	692	777		670	660	802		955	980	779		773	767		653
Temperature	deg C	16.07	22.8	20.87		15.2	12.68	11.6		14.8	17.9	7.1		9.6	24.4		14.2
Turbidity	NTU	0.48	0.52	0.6		0.29	0.41	0.37		1.35	0.21	0.75		0.53	0.29		1.91

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
"J" = Indicates the result was estimated.
"J+" = Indicates the result was estimated and may be biased high.
"J-" = Indicates the result was estimated and may be biased low.
"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-09														
		2016-07-19	2016-09-13	2016-11-16	2017-01-17	2017-01-17	2017-03-08	2017-03-08	2017-05-02	2017-07-05	2017-08-29	2017-08-29	2018-04-17	2018-05-08	2018-10-03	2019-04-04
		N	N	N	FD	N	FD	N	N	N	FD	N	N	N	N	N
Appendix III Parameters																
Boron	mg/L	2.6	2.8	2.8	2.4	2.3	1.8	1.8	1.7	2.1	3.4	3.4	1.4		3.3	2.7
Calcium	mg/L	110	100	94	100	99	97	97	110	130	170	160	94		91	77
Chloride	mg/L	70	65	60	60	59	66	63	68	71	71	70	76		84	79
Fluoride	mg/L	1.6	1.8 J	1.8 J	1.5 J-	1.4 J-	1.3 J	1.3 J	1.1 J	1.2 J	1.3 J	1.3 J	0.98 J	1.1 J	1.8	1.4
pH	SU	11.71	10.8	13.38		5.1		11.35	11.45	11.2		10.6	9.67	9.46	9.12	10.99
Sulfate	mg/L	250	220	170	180 J-	180 J-	190	190	220	260	370	370	240		230	170
Total Dissolved Solids	mg/L	590	510	510	500	490	470	520	500	620	910	940	520		530	530
Appendix IV Parameters																
Antimony	mg/L	0.00073 J	0.0013 J	0.0017 J	0.0011 J	0.0011 J	0.00062 J	0.00074 J	0.00068 J	0.00087 J	0.0014 J	0.0014 J	0.002	0.0016 J	0.0028	
Arsenic	mg/L	0.0084	0.01	0.013	0.013	0.013	0.009	0.0088	0.0087	0.0086	0.0087	0.0085	0.0067	0.0062	0.0083	
Barium	mg/L	0.021	0.019	0.02	0.018	0.017	0.014	0.014	0.015	0.022	0.044	0.042	0.03	0.026	0.029	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Chromium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00058 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Fluoride	mg/L	1.6	1.8 J	1.8 J	1.5 J-	1.4 J-	1.3 J	1.3 J	1.1 J	1.2 J	1.3 J	1.3 J	0.98 J	1.1 J	1.8	1.4
Lead	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Lithium	mg/L	0.001 J	0.0022 J	0.0015 J	0.008 U	0.008 U	0.008 U	0.00053 J	0.002 J	0.0017 J	0.008 U	0.008 U	0.0075 J	0.0062 J	0.015	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	
Molybdenum	mg/L	0.046	0.045	0.042	0.038	0.036	0.033	0.033	0.032	0.045	0.061	0.06	0.045	0.04	0.048	
Radium 226 + 228	pCi/L	0.414 U	0.519 U	0.663 U	0.673 UJ	20.2 J	0.41 U	0.429 U	0.514 U	0.263 J+	0.383 UJ	0.331 J+	0.404 U			
Radium-226	pCi/L	0.206 U	0.0827 U	0.313 U	0.364 U	0.345 U	0.135 U	0.125 U	0.0969 U	0.0712 U	0.148 J	0.0627 UJ	0.0814 U			
Radium-228	pCi/L	0.414 U	0.519 U	0.663 U	0.673 UJ	20 J	0.41 U	0.429 U	0.514 U	0.263 U	0.383 UJ	0.325 UJ	0.404 U			
Selenium	mg/L	0.0032 J	0.0013 J	0.00092 J	0.0019 J	0.0016 J	0.003 J	0.0032 J	0.0044 J	0.0046 J	0.007	0.0073	0.006	0.0038 J	0.0034 J	
Thallium	mg/L	0.0006 J	0.00061 J	0.0006 J	0.00034 J	0.00033 J	0.001 U	0.001 U	0.00022 J	0.00037 J	0.00065 J	0.00063 J	0.0014	0.0014	0.0015	
Field Parameters																
Dissolved Oxygen	mg/L	0.44	0.92	0.15		0.22		0.2	0.15	0.46		0.62	0.8	0.71	0.59	0.95
Oxidation-Reduction Potential	millivolts	-114.1	78.1	-134.6		1.6		-140.3	-173.3	57.8		155	-94.6	-318.6	3	131.9
pH	SU	11.71	10.8	13.38		5.1		11.35	11.45	11.2		10.6	9.67	9.46	9.12	10.99
Specific Conductance	uS/cm	683	874	1038		820		855	957	1051		1337	847	790	847	816
Temperature	deg C	12.63	20.1	24.05		20.23		15.19	11.16	13.1		15.8	10.3	11.1	21.6	15.8
Turbidity	NTU	3.52	0.94	0.59		0.23		0.53	0.37	1.7		0.34	1.11	0.5	0.29	0.4

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
"J" = Indicates the result was estimated.
"J+" = Indicates the result was estimated and may be biased high.
"J-" = Indicates the result was estimated and may be biased low.
"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-12													
		2016-07-18	2016-09-13	2016-11-16	2016-11-16	2017-01-17	2017-03-07	2017-03-07	2017-05-02	2017-07-05	2017-08-29	2017-10-09	2018-04-17	2018-10-04	2019-04-02
		N	N	FD	N	N	FD	N	N	N	N	N	N	N	N
Appendix III Parameters															
Boron	mg/L	1.3	1	1.2	1.2	1.1	1.1 J+	1.1 J+	1	0.69	0.69	1	0.39	1.2	1.7
Calcium	mg/L	100	110	110	110	120	120	110	120	120	140	170	48	110	230
Chloride	mg/L	61	70	57	57	64	39	37	15	15	22	35	71	120	220
Fluoride	mg/L	1.5	1.5 J	1.4 J	1.5 J	1.6 J-	1.9 J	2.1	2.1 J	1.5 J	1.2 J	1.4 J	1.4 J	1	0.13
pH	SU	7.7	6.96		7.78	7.81		7.45	7.28	7.46	7.04	6.71	7.35	6.93	5.7 O
Sulfate	mg/L	230	240	220	220	220 J-	250	250	320	320	440	480 J-	80	390	1800 O
Total Dissolved Solids	mg/L	590	580	600	610	600	610	600	550	630	890	1000	310	780	2700 O
Appendix IV Parameters															
Antimony	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U			0.002 U	0.002 U
Arsenic	mg/L	0.014	0.014	0.012	0.012	0.011	0.014	0.014	0.011	0.012	0.011			0.0082	0.012
Barium	mg/L	0.061	0.062	0.059	0.057	0.063	0.064	0.064	0.056	0.059	0.064			0.073	0.051
Beryllium	mg/L	0.001 UO	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Cadmium	mg/L	0.001 UO	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.0016
Chromium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00026 J	0.002 U	0.002 U	0.002 U	0.002 U			0.002 U	0.002 U
Cobalt	mg/L	0.001 U	0.00042 J	0.00041 J	0.00042 J	0.00043 J	0.00033 J	0.00033 J	0.00043 J	0.001 U	0.001 U			0.00049 J	0.084 O
Fluoride	mg/L	1.5	1.5 J	1.4 J	1.5 J	1.6 J-	1.9 J	2.1	2.1 J	1.5 J	1.2 J	1.4 J	1.4 J	1	0.13
Lead	mg/L	0.001 U	0.0034 J+	0.001 U	0.001 U	0.001 U	0.00017 J	0.00023 J	0.00066 J	0.001 U	0.001 U			0.001 U	0.001 U
Lithium	mg/L	0.043	0.048	0.042	0.041	0.037	0.033	0.035	0.038	0.036	0.035			0.041	0.17 O
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U			0.0002 U	0.0002 U
Molybdenum	mg/L	0.089	0.13	0.13	0.13	0.15	0.09	0.085	0.07	0.057	0.041			0.11	0.0032 J
Radium 226 + 228	pCi/L	0.402	0.369 U	0.467 U	0.423 U	0.831	0.654	1.06	0.44 U	0.544 J+	0.577 J+			0.832 J+	
Radium-226	pCi/L	0.25	0.258	0.423	0.388 U	0.299 J+	0.206	0.293	0.131	0.162 J+	0.218 J			0.493 J+	
Radium-228	pCi/L	0.393 U	0.369 U	0.467 U	0.423 U	0.544 U	0.448	0.77	0.44 U	0.382 J+	0.375 UJ			0.41 U	
Selenium	mg/L	0.005 U	0.005 U	0.005 U	0.00052 J	0.005 U	0.005 U	0.005 U	0.0034 J	0.005 U	0.005 U			0.0019 J	0.005 U
Thallium	mg/L	0.001 UO	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Field Parameters															
Dissolved Oxygen	mg/L	0.19	0.48		0.32	0.44		0	0.14	0.03	0.06	0.01	6.28	1.05	1.4
Oxidation-Reduction Potential	millivolts	-99.6	15.1		-54.6	-43.1		-75.9	-92	-56.5	13.5	-18.6	-89.8	-44.4	29.9
pH	SU	7.7	6.96		7.78	7.81		7.45	7.28	7.46	7.04	6.71	7.35	6.93	5.7
Specific Conductance	uS/cm	677	869		9.21	856		891	783	820	1019	1185	544	1097	2469
Temperature	deg C	16.02	19.2		17.41	12.7		12	11.73	15.44	17.45	17.77	9.1	17.1	12.2
Turbidity	NTU	1.03	1.22		0.35	4.67		2.97	1.76	1.02	0.63	1.48	3.78	0.39	0.43

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
"J" = Indicates the result was estimated.
"J+" = Indicates the result was estimated and may be biased high.
"J-" = Indicates the result was estimated and may be biased low.
"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-13												
		2016-07-18	2016-09-13	2016-11-16	2017-01-17	2017-03-08	2017-05-02	2017-07-05	2017-08-29	2018-04-16	2018-05-07	2018-10-02	2018-10-02	2019-04-04
		N	N	N	N	N	N	N	N	N	N	FD	N	N
Appendix III Parameters														
Boron	mg/L	0.72	1.1	1.2	1	1.1	0.89	0.96	0.97	0.54		0.91	0.91	0.78
Calcium	mg/L	130	120	170	97	89	85	81	95	110		94	92	93
Chloride	mg/L	66	60	51	56	53	62	62	53	83		82	82	34
Fluoride	mg/L	1.3	1.8 J	1.1 J	1.4 J-	1.5 J	1.8 J	1.5 J	1.3 J	1.1 J	0.97 J	1.3	1.3	1.2
pH	SU	8.34	6.36	8.29	8.19	7.6	7.79	8.02	8.07	8.32	8.12		7.42	8.03
Sulfate	mg/L	210	180	210	170 J-	170	170	160	170	190		170	170	150
Total Dissolved Solids	mg/L	780	690	960	530	510	480	470	570	620		560	570	560
Appendix IV Parameters														
Antimony	mg/L	0.0028	0.0031	0.003	0.0038	0.0026	0.002	0.0018 J	0.0026	0.0026	0.0024	0.0029	0.0028	
Arsenic	mg/L	0.029	0.034	0.03	0.036	0.031	0.038	0.049	0.043	0.039	0.04	0.039	0.038	
Barium	mg/L	0.039	0.033	0.048	0.028	0.022	0.02	0.02	0.024	0.025	0.023	0.024	0.023	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	0.001 U	
Chromium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.002 U	0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	0.001 U	
Fluoride	mg/L	1.3	1.8 J	1.1 J	1.4 J-	1.5 J	1.8 J	1.5 J	1.3 J	1.1 J	0.97 J	1.3	1.3	1.2
Lead	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	0.001 U	
Lithium	mg/L	0.036	0.042	0.051	0.036	0.029	0.032	0.028	0.031	0.027	0.027	0.043	0.045	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	0.0002 U	
Molybdenum	mg/L	0.041	0.06	0.045	0.072	0.058	0.036	0.031	0.053	0.029	0.03	0.042	0.041	
Radium 226 + 228	pCi/L	0.595 U	0.515 U	0.474 U	0.668 U	0.708	0.437 U	0.288 U	0.516 J+	0.435 U				
Radium-226	pCi/L	0.217 U	0.177	0.336 U	0.316 U	0.123 U	0.135 U	0.0733 U	0.0757 UJ	0.0928 U				
Radium-228	pCi/L	0.595 U	0.515 U	0.474 U	0.668 U	0.661	0.437 U	0.288 U	0.454 J+	0.435 U				
Selenium	mg/L	0.005	0.0056	0.018	0.0049 J	0.005	0.0051	0.0011 J	0.012	0.0085	0.0081	0.0043 J	0.0045 J	
Thallium	mg/L	0.0042	0.0043	0.0043	0.0025	0.0024	0.0018	0.0014	0.002	0.0018	0.0018	0.0023	0.0023	
Field Parameters														
Dissolved Oxygen	mg/L	0.18	0.34	0.39	0.61	0.21	0.48	1.73	1.21	1.92	1.23		0.62	1.93
Oxidation-Reduction Potential	millivolts	-22.6	819.2	-37.3	93.4	-14.5	140.7	136.1	181.9	-107.3	-324.8		121.3	121.9
pH	SU	8.34	6.36	8.29	8.19	7.6	7.79	8.02	8.07	8.32	8.12		7.42	8.03
Specific Conductance	uS/cm	913	949	1428	771	766	708	723	813	943	1679		840	626
Temperature	deg C	15.81	17.21	17.39	13.8	13.23	12.6	16.9	17.4	5.85	7.4		20.9	12.4
Turbidity	NTU	1.07	0.48	0.4	0.48	0.53	1.02	2.53	1.79	1.45	0.69		0.38	0.38

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
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pCi/L = picocuries per liter

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"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-14											
		2016-07-18	2016-09-12	2016-11-16	2017-01-17	2017-03-08	2017-05-02	2017-07-05	2017-08-29	2018-04-16	2018-05-07	2018-10-02	2019-04-03
		N	N	N	N	N	N	N	N	N	N	N	N
Appendix III Parameters													
Boron	mg/L	0.82	1.7	0.78	1	0.72	0.56	0.75	1.4	0.54		0.91	1.3
Calcium	mg/L	87	76	100	74	84	91	100	100	110		97	82
Chloride	mg/L	70	65	56	58	65	68	64	72	83		87	67
Fluoride	mg/L	1.6	1.9 J	1.2 J	1.5 J-	1.7 J	1.5 J	1.4 J	1.5 J	0.98 J	0.95 J	1.3	2.2
pH	SU	8.5	8.3	8.6	8.23	7.75	7.79	7.94	8.41	8.29	7.73	7.28	7.91
Sulfate	mg/L	180	130	150	150 J-	160	160	160	190	160		130	140
Total Dissolved Solids	mg/L	560	450	570	460	480	470	500	650	620		570	560
Appendix IV Parameters													
Antimony	mg/L	0.002 U	0.0024	0.0021	0.0021	0.0016 J	0.0013 J	0.0015 J	0.0017 J	0.00088 J	0.00099 J	0.0022	
Arsenic	mg/L	0.03	0.044	0.032	0.032	0.027	0.03	0.031	0.025	0.022	0.022	0.028	
Barium	mg/L	0.026	0.021	0.036	0.025	0.025	0.026	0.028	0.031	0.042	0.045	0.035	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Chromium	mg/L	0.002 U	0.0003 J	0.0012 J	0.00056 J	0.001 J	0.0014 J	0.0017 J	0.002 U	0.002 U		0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Fluoride	mg/L	1.6	1.9 J	1.2 J	1.5 J-	1.7 J	1.5 J	1.4 J	1.5 J	0.98 J	0.95 J	1.3	2.2
Lead	mg/L	0.001 U	0.0023	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Lithium	mg/L	0.016	0.021	0.036	0.026	0.021	0.024	0.022	0.022	0.024	0.022	0.043	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	
Molybdenum	mg/L	0.035	0.037	0.031	0.024	0.03	0.026	0.03	0.053	0.021	0.022	0.029	
Radium 226 + 228	pCi/L	0.382 U	0.738	0.438 U	0.466 U	0.377 U	0.467 U	0.31 U	0.635 J+	0.345 U			
Radium-226	pCi/L	0.154 U	0.0902 U	0.423 U	0.375 U	0.124 U	0.0909 U	0.0775 U	0.0951 UJ	0.0719 U			
Radium-228	pCi/L	0.382 U	0.663	0.438 U	0.466 U	0.377 U	0.467 U	0.31 U	0.574 J+	0.345 U			
Selenium	mg/L	0.021	0.056	0.019	0.021	0.026	0.027	0.034	0.014	0.0021 J	0.0016 J	0.041	
Thallium	mg/L	0.0026	0.0025	0.0034	0.0022	0.0023	0.0019	0.002	0.0024	0.0049	0.0052	0.0029	
Field Parameters													
Dissolved Oxygen	mg/L	0.72	0.71	1.45	1.78	2.01	4.27	4.05	2.72	8.1	8.88	0.76	5.48
Oxidation-Reduction Potential	millivolts	6.9	95.1	-20.4	73.1	31.9	163.1	207.3	177.4	-105.2	-298.7	121.2	178.8
pH	SU	8.5	8.3	8.6	8.23	7.75	7.79	7.94	8.41	8.29	7.73	7.28	7.91
Specific Conductance	uS/cm	688	698	939	717	754	824	823	881	991	2242	890	702
Temperature	deg C	16.25	18.89	20.2	15.1	13.15	11.6	17	18.1	3.9	9.9	22	14.1
Turbidity	NTU	0.69	0.95	0.66	0.39	0.36	0.91	1.79	0.85	1.2	0.88	0.47	0.32

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
"J" = Indicates the result was estimated.
"J+" = Indicates the result was estimated and may be biased high.
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"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-15												
		2016-07-18	2016-09-12	2016-11-16	2017-01-17	2017-03-08	2017-05-02	2017-05-02	2017-07-05	2017-08-29	2018-04-16	2018-05-07	2018-10-02	2019-04-03
		N	N	N	N	N	FD	N	N	N	N	N	N	N
Appendix III Parameters														
Boron	mg/L	1.2	2.2	1.9	1.5	1.2	0.99	1	1.1	1.7	0.59		1.3	2.8
Calcium	mg/L	56	58	69	60	65	69	71	78	91	84		64	36
Chloride	mg/L	70	64	60	60	62	68	69	64	72	77		86	82
Fluoride	mg/L	2.9	2.7	2.2	2.2 J-	1.8	1.7 J	1.7 J	1.6 J	1.9 J	0.65 J	0.76 J	2.9	1.8
pH	SU	9.09	9.58	9.48	9.63	9.11		7.95	8.49	9.79	9.03	8.14	7.73	9.29
Sulfate	mg/L	180	150	160	150 J-	150	160	160	170	220	150		150	130
Total Dissolved Solids	mg/L	460	360	480	380	390	370	370	420	570	530		460	330
Appendix IV Parameters														
Antimony	mg/L	0.002 U	0.003	0.003	0.0024	0.0015 J	0.0014 J	0.0015 J	0.0016 J	0.0021	0.0016 J	0.0015 J	0.0021	
Arsenic	mg/L	0.022	0.028	0.031	0.029	0.021	0.022	0.022	0.025	0.022	0.017	0.013	0.027	
Barium	mg/L	0.013	0.013	0.017	0.011	0.011	0.0089	0.0096	0.01	0.02	0.016	0.014	0.014	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.00047 J	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Chromium	mg/L	0.002 U	0.00031 J	0.00027 J	0.002 U	0.00038 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Fluoride	mg/L	2.9	2.7	2.2	2.2 J-	1.8	1.7 J	1.7 J	1.6 J	1.9 J	0.65 J	0.76 J	2.9	1.8
Lead	mg/L	0.001 U	0.003	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Lithium	mg/L	0.013	0.019	0.027	0.019	0.015	0.015	0.016	0.015	0.018	0.024	0.023	0.059	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	
Molybdenum	mg/L	0.035	0.031	0.028	0.023	0.022	0.015	0.015	0.043	0.059	0.025	0.026	0.026	
Radium 226 + 228	pCi/L	0.408 U	0.442 U	0.493 U	0.507 U	0.409 U	0.48 U	0.488 U	0.33 U	0.497 J+	0.34 U			
Radium-226	pCi/L	0.123 U	0.0989 U	0.457 U	0.306 U	0.113 U	0.0789 U	0.0911 U	0.101 U	0.0776 UJ	0.0782 U			
Radium-228	pCi/L	0.408 U	0.442 U	0.493 U	0.507 U	0.409 U	0.48 U	0.488 U	0.33 U	0.443 J+	0.34 U			
Selenium	mg/L	0.0084	0.011	0.031	0.0087	0.013	0.014	0.014	0.0068	0.012	0.0051	0.0033 J	0.012	
Thallium	mg/L	0.0025	0.0028	0.0037	0.002	0.0018	0.0011	0.0011	0.0012	0.0028	0.0011	0.0012	0.0021	
Field Parameters														
Dissolved Oxygen	mg/L	0.59	0.45	0.56	0.3	0.49		1.21	0.72	0.31	0.82	0.36	0.35	1.81
Oxidation-Reduction Potential	millivolts	206.8	71	104.8	22.7	12.1		189.7	227.3	192.2	-118.8	-292.6	150.7	102.1
pH	SU	9.09	9.58	9.48	9.63	9.11		7.95	8.49	9.79	9.03	8.14	7.73	9.29
Specific Conductance	uS/cm	632	657	719	621	644		649	692	910	841	787	747	538
Temperature	deg C	14.4	19.03	20.7	17.6	13.82		11.6	14.6	17.4	7.4	9.4	22.1	15.2
Turbidity	NTU	0.61	0.67	0.56	0.39	0.5		0.75	1.62	0.84	1.21	0.58	0.39	0.08

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

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"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-16																
		2016-07-18	2016-07-18	2016-09-13	2016-09-13	2016-11-16	2016-11-16	2017-01-17	2017-03-07	2017-05-02	2017-05-02	2017-07-05	2017-08-29	2018-04-17	2018-04-17	2018-05-08	2018-10-02	2019-04-04
		FD	N	FD	N	FD	N	N	N	FD	N	N	N	FD	N	N	N	N
Appendix III Parameters																		
Boron	mg/L	1.8	1.8	3	3.1	4	4.1	3.8	3.1 J+	2.2	2.2	2	2.3	2.2	2.1		3	3.5
Calcium	mg/L	43	42	38	36	30	31	32	35	54	53	69	88	99	98		84	71
Chloride	mg/L	67	67	60	60	66	66	310	60	66	68	65	69	58	58		79	66
Fluoride	mg/L	2.8	2.9	2	1.9	2.7	2.6	12 J-	2.3	2 J	1.9 J	1.7 J	3 J	1.2 J	1.2 J	1.1 J	1.3	1.3
pH	SU		9.25		9.49		9.5	4.86	9.47		9.06	9.26	9.37		9.33	9.27	8.83	9.53
Sulfate	mg/L	200	210	140	130	130	130	150 J-	150	170	170	180	280	220	210		200	180
Total Dissolved Solids	mg/L	390 J+	370 J+	310	340	380	380	380	340	340	350	390	630	550	570		480	490
Appendix IV Parameters																		
Antimony	mg/L	0.002 U	0.002 U	0.0019 J	0.0018 J	0.0022	0.0022	0.0017 J	0.0011 J	0.0014 J	0.0012 J	0.0014 J	0.0014 J		0.0034	0.0022	0.0024	
Arsenic	mg/L	0.041	0.039	0.045	0.042	0.044	0.045	0.049	0.035	0.031	0.03	0.023	0.026		0.03	0.034	0.029	
Barium	mg/L	0.012	0.012	0.0076	0.0071	0.0067	0.0067	0.0073	0.0068	0.0081	0.0078	0.0084	0.014		0.013	0.011	0.0094	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		0.001 U	
Chromium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.00027 J	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U		0.002 U		0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		0.001 U	
Fluoride	mg/L	2.8	2.9	2	1.9	2.7	2.6	12 J-	2.3	2 J	1.9 J	1.7 J	3 J	1.2 J	1.2 J	1.1 J	1.3	1.3
Lead	mg/L	0.001 U	0.001 U	0.0021 J+	0.0026 J+	0.00016 J	0.00018 J	0.001 U	0.0002 J	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U		0.001 U	
Lithium	mg/L	0.013	0.012	0.013	0.011	0.011	0.012	0.014	0.012	0.015	0.015	0.014	0.015		0.011	0.01	0.013	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U		0.0002 U	
Molybdenum	mg/L	0.088	0.084	0.056	0.053	0.065	0.064	0.077	0.077	0.048	0.048	0.037	0.054		0.049	0.054	0.035	
Radium 226 + 228	pCi/L	0.365 U	0.454 U	0.525 U	0.584 U	0.659	0.638	0.506 U	0.385 U	0.475	0.439	0.432 J+	0.511 J+		0.365 U			
Radium-226	pCi/L	0.145 U	0.151 U	0.0998 U	0.103	0.353 U	0.392 U	0.35 U	0.133 U	0.0767 U	0.0762 U	0.0965 J+	0.111 J		0.0684 U			
Radium-228	pCi/L	0.365 U	0.454 U	0.525 U	0.584 U	0.558	0.58	0.506 U	0.385 U	0.443 U	0.388	0.335 J+	0.399 J+		0.365 U			
Selenium	mg/L	0.0085	0.0075	0.012	0.012	0.0072	0.0074	0.0089	0.0071	0.008	0.0076	0.011	0.011		0.082	0.031	0.023	
Thallium	mg/L	0.001 U	0.001 U	0.0013	0.0013	0.0012	0.0012	0.0013	0.0014	0.0015	0.0015	0.0014	0.0025		0.0017	0.0013	0.0014	
Field Parameters																		
Dissolved Oxygen	mg/L		0.41		0.33		0.44	0.15	0.09		0.29	1.33	0.49		0.61	0.16	0.54	0.89
Oxidation-Reduction Potential	millivolts		128.4		65.2		121.3	52.3	-75.1		60.1	191.2	153.9		-100.8	-329.9	84.8	173.9
pH	SU		9.25		9.49		9.5	4.86	9.47		9.06	9.26	9.37		9.33	9.27	8.83	9.53
Specific Conductance	uS/cm		655		622		625	649	622		652	674	872		925	843	786	595
Temperature	deg C		14.8		16.13		17.3	17.37	17.14		14.9	16.5	17		13.2	14.4	17.1	13.5
Turbidity	NTU		1.19		0.56		0.46	0.36	0.4		0.68	1.47	0.31		0.72	0.49	0.4	0.33

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
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pCi/L = picocuries per liter

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"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-17												
		2016-07-18	2016-09-13	2016-11-16	2017-01-17	2017-03-07	2017-05-02	2017-07-05	2017-08-29	2018-04-17	2018-04-17	2018-05-08	2018-10-03	2019-04-04
		N	N	N	N	N	N	N	N	FD	N	N	N	N
Appendix III Parameters														
Boron	mg/L	1.1	1.1	1.1	0.56	0.68 J+	0.91	0.64	1.1		1.4		1.3	1.7
Calcium	mg/L	83	87	81	91	88	88	120	130		120		96	82
Chloride	mg/L	66	59	58	59	62	64	76	69		73		88	79
Fluoride	mg/L	0.82 J	1.7 J	1.7	1.6 J-	1.2 J	0.99 J	0.86 J	0.77 J	0.79 J	0.81 J	0.92 J	1.2	1.5
pH	SU	8.29	6.31	8.98	4.97	8.38	7.92	8.56	8.78		8.33	8.31	7.63	8.71
Sulfate	mg/L	180	180	170	190 J-	200	200	150	180		240		190	230
Total Dissolved Solids	mg/L	510	470	500	520	510	530	670	840	690	720		560	570
Appendix IV Parameters														
Antimony	mg/L	0.002 U	0.0029	0.0029	0.0025	0.0015 J	0.0014 J	0.0013 J	0.002	0.0014 J	0.0012 J	0.0016 J	0.0029	
Arsenic	mg/L	0.015	0.027	0.028	0.036	0.034	0.045	0.048	0.058	0.032	0.032	0.03	0.036	
Barium	mg/L	0.054	0.059	0.056	0.062	0.052	0.053	0.1	0.12	0.14	0.14	0.11	0.1	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Chromium	mg/L	0.0006 J	0.002 U	0.002 U	0.00057 J	0.0012 J	0.0018 J	0.002 U	0.002 U	0.0012 J	0.0013 J	0.002 U	0.002 U	
Cobalt	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Fluoride	mg/L	0.82 J	1.7 J	1.7	1.6 J-	1.2 J	0.99 J	0.86 J	0.77 J	0.79 J	0.81 J	0.92 J	1.2	1.5
Lead	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U		0.001 U	
Lithium	mg/L	0.016	0.03	0.039	0.027	0.021	0.023	0.026	0.027	0.019	0.018	0.016	0.033	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	
Molybdenum	mg/L	0.036	0.038	0.038	0.035	0.037	0.033	0.026	0.032	0.037	0.038	0.035	0.036	
Radium 226 + 228	pCi/L	0.392 U	0.506 U	0.757	0.489 U	0.427 U	0.367 U	0.614 J+	0.553 J+	0.397 U	0.359 U			
Radium-226	pCi/L	0.125 U	0.115 U	0.367 U	0.307 U	0.128 U	0.0813 U	0.0897 J+	0.172 J	0.0967	0.119			
Radium-228	pCi/L	0.392 U	0.506 U	0.458 U	0.489 U	0.427 U	0.367 U	0.524 J+	0.381 J+	0.397 U	0.359 U			
Selenium	mg/L	0.012	0.085	0.024	0.023	0.059	0.11	0.1	0.17	0.018	0.019	0.012	0.029	
Thallium	mg/L	0.0025	0.0042	0.0039	0.0023	0.002	0.0019	0.0042	0.0056	0.0048	0.0047	0.0043	0.0035	
Field Parameters														
Dissolved Oxygen	mg/L	0.61	0.26	0.23	0.24	1.49	1.87	0.62	0.9		0.69	0.63	0.29	0.68
Oxidation-Reduction Potential	millivolts	132.8	841.3	106.5	137.9	7	98.3	162.4	148.6		-96.2	-321.5	4.1	170.5
pH	SU	8.29	6.31	8.98	4.97	8.38	7.92	8.56	8.78		8.33	8.31	7.63	8.71
Specific Conductance	uS/cm	688	784	764	779	844	853	1075	1182		1096	932	904	767
Temperature	deg C	16.9	26.8	29.4	21.1	15.4	12.9	15.9	18.8		9.9	10.2	26	17.9
Turbidity	NTU	0.65	0.49	0.5	0.23	0.49	0.8	1.69	0.48		0.77	0.48	0.21	0.25

Note:
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"UJ" = Indicates the result was not detected above the MDL, the estimated RL is provided.
"O" = Indicates the result was identified as an outlier and removed from the background data set.

Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GAMW-18											
		2016-07-18	2016-09-13	2016-11-16	2017-01-16	2017-03-07	2017-05-02	2017-07-05	2017-08-29	2017-10-09	2018-04-17	2018-10-04	2019-04-02
		N	N	N	N	N	N	N	N	N	N	N	N
Appendix III Parameters													
Boron	mg/L	1.2	1.3	1.6	1.7	0.46 J+	0.85	0.92	1.5	1.2	0.9	1.8	2.1
Calcium	mg/L	170	180	180	130	80	110	150	110	180	170	110	230
Chloride	mg/L	300	350	390	140	29	150	240	99	320	530	260	62
Fluoride	mg/L	1.5	1.8 J	1.4 J	1.6 J-	1.3	1.7 J	1.6 J	1.4 J	1.4 J	1.7 J	2.3	0.9
pH	SU	7.54	7.01	7.36	4.18 O	7.26	6.96	7.18	6.99	6.76	7.17	6.84	6.67
Sulfate	mg/L	280	260	250	250 J-	100	190	170	240	220 J-	210	310	990
Total Dissolved Solids	mg/L	1100	670	1300	810	390	810	910	720	1300	1400	920	1500
Appendix IV Parameters													
Antimony	mg/L	0.002 U	0.00035 J	0.00044 J	0.00041 J	0.00081 J	0.002 U	0.00071 J	0.0008 J			0.002 U	0.002 U
Arsenic	mg/L	0.0064	0.004 J	0.0048 J	0.0044 J	0.0018 J	0.0045 J	0.0053	0.0036 J			0.0031 J	0.0022 J
Barium	mg/L	0.081	0.092	0.1	0.06	0.0085 O	0.066	0.077	0.06			0.067	0.12
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00035 J	0.00022 J			0.001 U	0.001 U
Chromium	mg/L	0.002 U	0.00029 J	0.002 U	0.00073 J	0.0005 J	0.0012 J	0.0011 J	0.002 U			0.002 U	0.002 U
Cobalt	mg/L	0.001 U	0.00081 J	0.00075 J	0.00059 J	0.00027 J	0.00042 J	0.001 U	0.001 U			0.0011	0.0015
Fluoride	mg/L	1.5	1.8 J	1.4 J	1.6 J-	1.3	1.7 J	1.6 J	1.4 J	1.4 J	1.7 J	2.3	0.9
Lead	mg/L	0.001 U	0.0027 J+	0.001 U	0.001 U	0.00018 J	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Lithium	mg/L	0.068	0.091	0.1	0.066	0.008 UO	0.077	0.066	0.059			0.06	0.089
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U			0.0002 U	0.0002 U
Molybdenum	mg/L	0.06	0.056	0.054	0.072	0.02	0.067	0.055	0.11			0.093	0.02
Radium 226 + 228	pCi/L	0.877	0.676	0.914	0.59 U	0.337 U	0.374	0.758 J+	0.451 J+			0.669 J+	
Radium-226	pCi/L	0.185 U	0.38	0.426 U	0.368 U	0.106 U	0.162	0.233 J+	0.187 J			0.473 J+	
Radium-228	pCi/L	0.715	0.442 U	0.604	0.59 U	0.337 U	0.364 U	0.525 J+	0.335 UJ			0.369 U	
Selenium	mg/L	0.005 U	0.003 J	0.0015 J	0.0019 J	0.0043 J	0.0088	0.013	0.0038 J			0.0037 J	0.0026 J
Thallium	mg/L	0.001 UO	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U			0.001 U	0.001 U
Field Parameters													
Dissolved Oxygen	mg/L	0.59	0.27	0.58	0.22	0.86	0.43	0.23	0.27	0.27	0.4	0.4	1.4
Oxidation-Reduction Potential	millivolts	125.1	67.1	146.4	111.6	11.6	-31.7	15.5	48.1	44.6	-81.3	-15.9	25.9
pH	SU	7.54	7.01	7.36	4.18	7.26	6.96	7.18	6.99	6.76	7.17	6.84	6.67
Specific Conductance	uS/cm	1536	1869	1916	1197	1497	1310	1488	1007	1661	2288	1481	1475
Temperature	deg C	18.3	19.92	19.1	15.66	14.24	13.87	17.56	19.23	19.09	11.4	19.5	13.3
Turbidity	NTU	1.56	1.86	0.5	0.46	0.79	1.45	0.44	0.56	0.31	3.53	1.29	0.42

Note:
mg/L = milligrams per liter
uS/cm = micro Siemens per centimeter
deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
SU = Standard Units
pCi/L = picocuries per liter

"U" = Indicates the result was not detected above the method detection limit (MDL) for the sample; the quantitation limit (RL) is provided.
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Table 3: Analytical Data
CCR Unit Primary 2
NIPSCO Michigan City Generating Station
Michigan City, Indiana

Analyte	Unit	GMMW-1											
		2016-07-19	2016-09-13	2016-11-17	2017-01-17	2017-03-07	2017-05-03	2017-07-05	2017-08-29	2018-04-17	2018-05-07	2018-10-02	2019-04-04
		N	N	N	N	N	N	N	N	N	N	N	N
Appendix III Parameters													
Boron	mg/L	2	3.3	1.5	2.4	1.3 J+	1.5	2.4	3	0.58		1.6	3.3
Calcium	mg/L	50	81	93	46	62	63	53	52	96		78	31
Chloride	mg/L	65	60	56	61	58	57	70	84	78		81	75
Fluoride	mg/L	2.2	3.1	2.4 J	2.9 J-	2	1.8 J	2.5	3.5 J	1 J	0.98 J	1.8	2.5
pH	SU	8.79	8.33	9.18	4.7	8.69	7.56	9.03	9.56	8.39	8.01	7.57	9.32
Sulfate	mg/L	150	150	170	130 J-	160	180	160	300	150		170	140
Total Dissolved Solids	mg/L	430	510	540	370	380	380	360	500	560		540	410
Appendix IV Parameters													
Antimony	mg/L	0.00072 J	0.0019 J	0.0019 J	0.00097 J	0.002	0.0023	0.00073 J	0.0016 J	0.002	0.0018 J	0.0025	
Arsenic	mg/L	0.016	0.026	0.028	0.043	0.03	0.027	0.019	0.038	0.017	0.014	0.019	
Barium	mg/L	0.045	0.063	0.077	0.03	0.043	0.032	0.033	0.072	0.079	0.064	0.063	
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00048 J	0.001 U	0.001 U	
Cadmium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.00031 J	0.001 U	0.001 U	
Chromium	mg/L	0.00062 J	0.0017 J	0.00061 J	0.002 U	0.0011 J	0.0015 J	0.002 U	0.002 U	0.002 U		0.002 U	
Cobalt	mg/L	0.00032 J	0.00017 J	0.001 U	0.00016 J	0.001 U	0.00025 J	0.001 U	0.001 U	0.00025 J	0.001 U	0.001 U	
Fluoride	mg/L	2.2	3.1	2.4 J	2.9 J-	2	1.8 J	2.5	3.5 J	1 J	0.98 J	1.8	2.5
Lead	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U		0.001 U	
Lithium	mg/L	0.012	0.023	0.031	0.017	0.016	0.017	0.012	0.013	0.017	0.018	0.039	
Mercury	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	
Molybdenum	mg/L	0.043	0.061	0.034	0.044	0.035	0.045	0.057	0.079	0.025	0.03	0.034	
Radium 226 + 228	pCi/L	0.47 U	0.476 U	0.622	3.13	0.39 U	0.489 U	0.42 J+	1.23 J+	0.338 U			
Radium-226	pCi/L	0.174 U	0.0778	0.376 U	0.415 U	0.143 U	0.0942 U	0.123 J+	0.0555 UJ	0.0744 U			
Radium-228	pCi/L	0.47 U	0.476 U	0.483 U	2.8	0.39 U	0.489 U	0.367 U	1.19 J+	0.338 U			
Selenium	mg/L	0.016	0.057	0.075	0.0058	0.044	0.047	0.0033 J	0.02	0.0073	0.0045 J	0.035	
Thallium	mg/L	0.0036	0.0046	0.0052	0.0023	0.0027	0.0014	0.0014	0.0043	0.0032	0.0029	0.0024	
Field Parameters													
Dissolved Oxygen	mg/L	0.85	1.09	0.26	0.17	0.49	1.84	0.9	1.96	0.74	1.21	0.56	1.56
Oxidation-Reduction Potential	millivolts	31	69.5	-121.2	74.6	3.4	80	209.7	169.6	-251.4	-273.7	91.8	186.1
pH	SU	8.79	8.33	9.18	4.7	8.69	7.56	9.03	9.56	8.39	8.01	7.57	9.32
Specific Conductance	uS/cm	541	841	1018	591	664	618	639	1015	883	1271	804	559
Temperature	deg C	13.97	19.39	22.48	18.7	15.7	13.3	15.2	16.8	7.76	4.6	21.9	14.1
Turbidity	NTU	0.91	2.16	0.51	0.32	0.43	0.49	1.58	0.68	0.69	0.55	0.35	0.29

Note:
mg/L = milligrams per liter
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deg C = degrees Celsius
NTU = Nephelometric Turbidity Units
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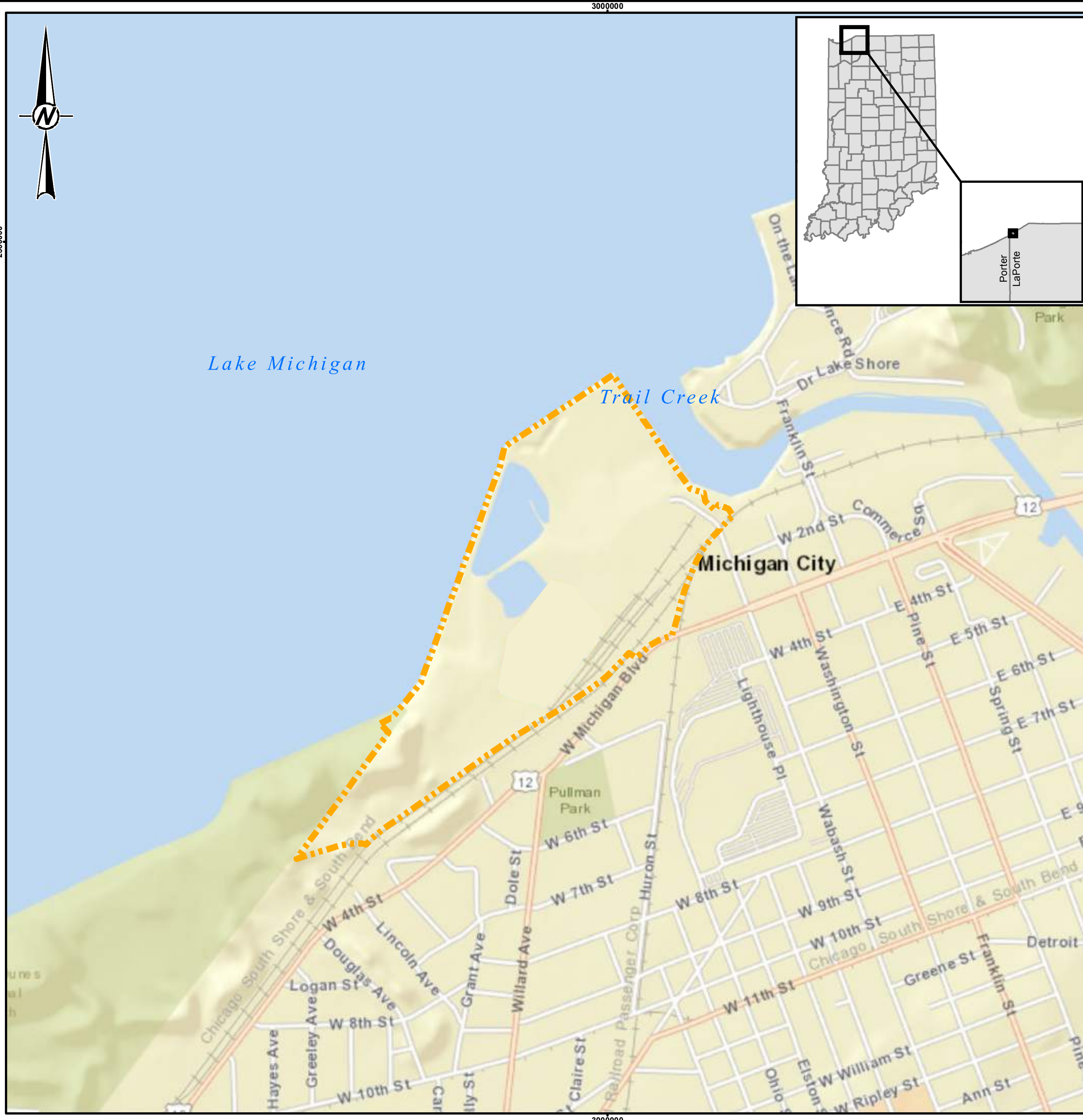
Prepared by: DFS
Checked by: ANB
Reviewed by: MAH

FIGURES



LEGEND

Approximate Property Line

0 1,250 2,500

1 " = 1,250 feet Feet

REFERENCE(S)

SERVICE LAYER CREDITS: SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

CLIENT

NORTHERN INDIANA PUBLIC SERVICE COMPANY

PROJECT

NORTHERN INDIANA PUBLIC SERVICE COMPANY
MICHIGAN CITY GENERATING STATION
MICHIGAN CITY, INDIANA

TITLE

SITE LOCATION MAP

CONSULTANT

GOLDER

YYYY-MM-DD	7/22/2019
DESIGNED	DFS
PREPARED	SHL
REVIEWED	JSP
APPROVED	MAH

PROJECT NO.	CONTROL	REV.	FIGURE
19121568	A	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

LEGEND

- CCR Background Groundwater Monitoring Well
- CCR Downgradient Groundwater Monitoring Well
- Generalized Groundwater Flow Direction
- Existing Sheet Piles
- Approximate Property Line
- CCR Unit

0 100 200

1 inch = 100 feet Feet

NOTE(S)

REFERENCE(S)

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CLIENT

NIPSCO MICHIGAN CITY GENERATING STATION
MICHIGAN CITY, INDIANA

PROJECT

NIPSCO MICHIGAN CITY GENERATING STATION
MICHIGAN CITY, INDIANA

TITLE

WELL LOCATION MAP
PRIMARY 2

CONSULTANT		
GOLDER	YYYY-MM-DD	7/22/2019
	DESIGNED	MAH
	PREPARED	SHL
	REVIEWED	JSP
	APPROVED	MAH

PROJECT NO.	CONTROL	REV.	FIGURE
19121568	-	1	2