

2019 Annual Groundwater Monitoring and Corrective Action Report - Landfill Phase V and Phase VI

NIPSCO LLC R. M. Schahfer 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 LLC

R.M. Schahfer Generating Station Wheatfield, Indiana

Submitted by:

Golder Associates Inc.

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191-21567

January 31, 2020

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RMSGS Landfill Phases V and VI Alternative Source Demonstration March 2019

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RMSGS Landfill Phases V and VI Alternative Source Demonstration September 2019

1.0 INTRODUCTION

On behalf of Northern Indiana Public Service Company LLC (NIPSCO LLC), Golder Associates Inc. (Golder) prepared this 2019 Annual Groundwater Monitoring and Corrective Action Report (2019 Annual Report) for the Rollin M. Schahfer Generating Station (RMSGS, Schahfer) Landfill Phases V and VI (together, the CCR Unit) located at 2723 E 1500 N Road in Wheatfield, Jasper County, Indiana (Latitude 41° 12' 36" N and Longitude 87° 01' 48" W, see Figure 1). Phase V is an approximately 18-acre cell that stopped receiving CCR on April 1, 2017. Phase VI is an approximately 15-acre cell located due north of Phase V, which began receiving CCR on August 1, 2016. Closed, non-regulated (under the CCR Rule) Schahfer Landfill Phases I through IV are primarily located east of the CCR Rule-regulated landfill cells as shown in Figure 2. Golder prepared the 2019 Annual Report in accordance with 40 Code of Federal Regulations (CFR) Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule" (CCR Rule), as amended, and corresponding regulations under 329 Indiana Administrative Code (IAC) 10-9-1.

To comply with the CCR Rule, NIPSCO LLC and Golder decided to monitor Phases V and VI as one CCR Unit due to the design, construction, and proximity of historical non-regulated landfill cells (i.e., Phases II and III) and because there is no practical means of monitoring groundwater between the two CCR landfill cells (i.e., Phases V and VI). In 2018, NIPSCO LLC began construction of a new landfill cell Phase VII, located adjacent to and immediately north of Phase VI, which will open in 2020. Consequently, the monitoring wells installed immediately downgradient of Phase VI were replaced with monitoring wells installed immediately downgradient of Phase VII. 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 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 Rule groundwater activities completed during calendar year 2019
- Includes CCR Rule groundwater monitoring data obtained in calendar year 2019
- Describes any problems encountered during monitoring activities
- Discusses actions taken to resolve the problems, if applicable
- Projects key activities for the upcoming year

2.0 GROUNDWATER MONITORING AND CORRECTIVE MEASURES 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 and performed Detection Monitoring at the CCR Unit pursuant to the requirements of 40 CFR §257.94. In 2019, Golder performed the fourth and fifth Detection Monitoring sampling events. Based upon groundwater monitoring results collected pursuant to the CCR Rule to date, corrective measures program requirements have neither been triggered nor implemented at the CCR Unit.

2.1 Key Actions Completed - 2019

NIPSCO LLC completed the following key actions relative to CCR Rule groundwater monitoring at the RMSGS Landfill Phases V and VI during calendar year 2019:

- Preparation of the of 2018 Groundwater Monitoring and Corrective Action Annual Report in January 2019 (2018 Annual Report, 40 CFR §257.90(e))
- Recertification of the RMSGS Landfill Phases V and VI Alternative Source Demonstration (ASD) in March 2019 (40 CFR §257.94(e))
- Performance of the fourth Detection Monitoring event in March 2019 (40 CFR §257.94)
- Evaluation of the results of the fourth Detection Monitoring event in June 2019 (40 CFR §257.95(d))
- Recertification of the RMSGS Landfill Phases V and VI ASD in September 2019 (40 CFR §257.94(e))
- Performance of the fifth Detection Monitoring event in September 2019 (40 CFR §257.94)

2.2 Monitoring System Modifications

No modifications were made to the groundwater monitoring network in 2019. An overview of the groundwater monitoring network is provided below.

Background Monitoring Wells	Downgradient Monitoring Wells	Decommissioned Monitoring Wells
GAMW-20, GAMW-24, GAMW-24B, GAMW- 25, GAMW-25B	GAMW-26, GAMW-26B, GAMW-27, GAMW-27B, GAMW-38, GAMW-38B, GAMW-39, GAMW-39B, GAMW-40, GAMW-40B, GAMW-41, GAMW-41B	GAMW-21, GAMW-21B, GAMW-22, GAMW-22B, GAMW-23, GAMW-23B, GAMW-28, GAMW-28B

Table 1 provides a summary of the well rationale/purpose and date of installation. Golder installed, developed, and surveyed the wells in accordance with the CCR Groundwater Monitoring Program Implementation Manual prepared by Golder in October 2017.

2.3 Background Monitoring (2016 to 2017)

Per the requirements of 40 CFR §257.94, Golder collected eight independent background groundwater samples from each background and downgradient well between July 2016 and August 2017. 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. The background data set is included in the 2017 Annual Groundwater Monitoring and Corrective Action Report, dated January 31, 2018 (2017 Annual Report).

2.4 Detection Monitoring

Golder performed the first Detection Monitoring event in October 2017, followed by a statistical evaluation and data analysis in January 2018. Golder collected groundwater samples from Landfill Phases V and VI background and downgradient monitoring wells for analysis of Appendix III constituents per 40 CFR §257.94 and included the

results in the 2017 Annual Report. Following receipt and validation of laboratory results, Golder evaluated the results of the first Detection Monitoring sampling event to compare the concentration of 40 CFR Part 257 Appendix III constituents relative to facility background concentrations. Using Sanitas ™ software, Golder pooled the background data to calculate prediction limits and compared the October 2017 results to the calculated prediction limits to identify statistically significant increases (SSIs).

Golder determined that SSIs existed for Phases V and VI in January 2018. Golder identified a potential alternative source that could explain the SSIs and prepared an ASD. A qualified Indiana-licensed professional engineer certified the ASD in April 2018. The ASD supports the findings that the SSIs determined in January 2018 do not result from a release from the CCR Unit. The key supporting lines of evidence described in the ASD indicate that the closed, non-regulated phases of the landfill (i.e., Phases I and II) are the source of the SSIs. Therefore, no further action (i.e., Assessment Monitoring) is warranted, and Phases V and VI will remain in Detection Monitoring. The ASD is presented in Appendix A of the 2018 Annual Groundwater Monitoring and Corrective Action Report, dated January 31, 2019 (2018 Annual Report).

Golder performed the second Detection Monitoring event in February 2018, followed by a statistical evaluation and data analysis in May 2018 that determined that SSIs existed for Phases V and VI. Consistent with the previous evaluation, Golder identified a potential alternative source that explained the SSIs. A qualified Indianalicensed professional engineer recertified the ASD in August 2018 (Appendix B of the 2018 Annual Report). Golder performed the third Detection Monitoring event in September 2018 followed by a statistical evaluation and data analysis in December 2018 that determined that SSIs existing for Phases V and VI. Consistent with previous evaluations, Golder identified a potential alternative source that explained the SSIs. A qualified Indianalicensed professional engineer recertified the ASD in March 2019 (Appendix A). The results from the second and third Detection Monitoring events are included in the 2018 Annual Report.

Golder performed the fourth Detection Monitoring event in February/March 2019 followed by a statistical evaluation and data analysis in June 2019. The SSIs identified are summarized in the table below by downgradient monitoring well and constituent. Consistent with previous evaluations, Golder identified a potential alternative source that explained the SSIs. A qualified Indiana-licensed professional engineer recertified the ASD in September 2019 (Appendix B).

	Boron	Calcium	Chloride	Fluoride	Sulfate	рН¹	Total Dissolved Solids
GAMW-26							
GAMW-26B							
GAMW-27	Х	Х			Х		Х
GAMW-27B	Х		Х		Х		Х
GAMW-38							
GAMW-38B	Х	Х	Х		Х		Х
GAMW-39		Х					
GAMW-39B	Х	Х	Х		Х		Х

	Boron	Calcium	Chloride	Fluoride	Sulfate	рН¹	Total Dissolved Solids
GAMW-40	Х	Х					Х
GAMW-40B	Х	Х	х		Х	Х	Х
GAMW-41	Х	Х	х		Х		Х
GAMW-41B	Х	Х	Х		Х		Х

"X" represents an SSI

 $1 = p\dot{H}$ value is based on field water quality meter reading

Golder performed the fifth Detection Monitoring event in October 2019 and will perform the statistical evaluation and data analysis in February 2020.

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 upon groundwater quality. 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 has not identified any additional outliers since the 2018 Annual Report. Golder will continue to monitor trends and, if the CCR Unit enters Assessment Monitoring, detrending routines will be performed before using these data to calculate GWPS.

2.6 Problems Encountered and Follow-Up Corrective Actions

During the October 2019 monitoring event, groundwater samples were not collected from GAMW-39/39B due to administrative oversight. Samples were collected from these wells on December 5, 2019 to meet the semi-annual sampling requirement for 2019.

In the fourth Detection Monitoring event (October 2019), groundwater was sampled from GAMW-20 at a turbidity level of approximately 7.5 nephelometric turbidity units (NTUs). According to the CCR Groundwater Monitoring Program Implementation Manual (Golder 2017), groundwater samples are to be collected once a well has achieved a turbidity level below 5 NTUs. Due to time constraints in the field, wells were purged for a minimum of two hours and sampled when turbidity appeared to stabilize (e.g., no downward or upward trend over three consecutive readings five minutes apart). Evaluation of the analytical results from this well suggests that the slightly elevated turbidity levels had no significant effect on the representativeness of the samples of groundwater quality. Moving forward, wells will be purged for two hours or five well volumes, whichever is shorter. Professional judgement will then be used to determine when the purge water is representative of groundwater for sampling. In the event that an acceptable turbidity level cannot be achieved within a reasonable timeframe (e.g. three hours), Golder will redevelop the affected monitoring wells prior to the next sampling event.

3.0 KEY ACTIVITIES PROJECTED FOR 2020

During calendar year 2020, NIPSCO LLC anticipates conducting the following key CCR Rule groundwater monitoring activities for the RMSGS Landfill Phases V and VI:

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

4.0 **REFERENCES**

- Golder Associates, "2017 Annual Groundwater Monitoring and Corrective Action Report- Landfill Phase V and Phase VI NIPSCO R. M. Schahfer Generating Station", January 31, 2018.
- Golder Associates, "2018 Annual Groundwater Monitoring and Corrective Action Report- Landfill Phase V and Phase VI NIPSCO R. M. Schahfer Generating Station", January 31, 2019.
- Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", August 28, 2018.
- Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", April 13, 2018.

Tables

Table 1: Monitoring Well Network

CCR Unit Schahfer Landfill Phases V and VI NIPSCO LLC Rollin M. Schahfer Generating Station Wheatfield, Indiana

CCR Unit	Well Purpose	Monitoring Well ID	Installation Date	Decommission Date (If Applicable)	Basis For Action
		GAMW-20	5/27/2016	-	
		GAMW-24	9/26/2016	-	
	Background Monitoring Well	GAMW-24B	9/26/2016	-	Installed for Groundwater Quality Monitoring ⁽¹⁾
	wormoning wei	GAMW-25	10/4/2016	-	
		GAMW-25B	10/5/2016	-	
		GAMW-21	5/31/2016	4/5/2018	
		GAMW-21B	5/31/2016	4/5/2018	
		GAMW-22	5/31/2016	4/5/2018	
		GAMW-22B	6/2/2016	4/5/2018	About the set of the
		GAMW-23	6/2/2016	4/6/2018	Abandoned due to Landfill Construction Activities
		GAMW-23B	6/2/2016	4/6/2018	
LANDFILL		GAMW-28	9/29/2016	4/6/2018	
Phase V and		GAMW-28B	9/29/2016	4/6/2018	
Phase VI		GAMW-26	10/4/2016	-	
	Downgradient	GAMW-26B	10/4/2016	-	Installed for Croundwater Quality Manitoring ⁽¹⁾
	Monitoring Well	GAMW-27	10/3/2016	-	Installed for Groundwater Quality Monitoring*
		GAMW-27B	10/4/2016	-	
		GAMW-38	4/4/2018	-	
		GAMW-38B	4/3/2018	-	
		GAMW-39	4/4/2018	-	
		GAMW-39B	4/4/2018	-	Installed to Deplese Abandoned Mod ⁽³⁾
		GAMW-40	4/5/2018	-	Installed to Replace Abandoned Well
		GAMW-40B	4/4/2018	-	
		GAMW-41	5/17/2018	-	
		GAMW-41B	5/17/2018	-	

Notes:

1) Per the CCR Rule requirements, Golder collected eight rounds of background data prior to October 17, 2017.

2) Monitoring well was abandoned due to the construction of landfill phase VII.

3) Monitoring well was installed to replace an abandoned monitoring well. Well was first sampled in September 2018.

Prepared by: AMH Checked by: KMC Reviewed by: MAH



Table 2: Summary of Sampling EventsCCR Unit Schahfer Landfill Phases V and VINIPSCO LLC Rollin M. Schahfer Generating StationWheatfield, Indiana

Well Purpose	Monitoring Well ID	Sample Event #14	Sample Event #15	
Purpose o	f Sample	Detection Monitoring	Detection Monitoring	Total Number of Samples
Sample Pa	rameters	Appendix III	Appendix III	
	GAMW-20	2/26/2019	10/9/2019	2
Background	GAMW-24	2/27/2019	10/7/2019	2
Monitoring Well	GAMW-24B	2/27/2019	10/7/2019	2
wormoning wor	GAMW-25	2/28/2019	10/8/2019	2
	GAMW-25B	2/28/2019	10/8/2019	2
	GAMW-26	2/28/2019	10/8/2019	2
	GAMW-26B	2/28/2019	10/8/2019	2
	GAMW-27	2/26/2019	10/9/2019	2
	GAMW-27B	2/27/2019	10/9/2019	2
	GAMW-38	2/27/2019	10/10/2019	2
	GAMW-38B	2/27/2019	10/10/2019	2
	GAMW-39	2/27/2019	12/5/2019 ⁽²⁾	2
	GAMW-39B	2/28/2019	12/5/2019 ⁽²⁾	2
	GAMW-40	2/28/2019	10/10/2019	2
	GAMW-40B	2/28/2019	10/10/2019	2
	GAMW-41	2/28/2019	10/10/2019	2
	GAMW-41B	3/1/2019	10/10/2019	2
Total Number	r of Samples	17	17	34

Notes:

Sample counts do not include QA/QC samples.

(1) Sample events #1-#13 were completed prior to 2019. The purpose, sample parameters, and sample dates are included in the 2017 Annual Report and the 2018 Annual Report.

(2) Sample was not collected during the October 2019 sample event due to administrative oversight. Samples were collected from these wells on December 5, 2019 to meet the semi-annual sampling requirement for 2019.

Prepared by: DFS Checked by: AMH Reviewed by: MAH

 Table 3: Analytical Data

 CCR Unit R. M. Schahfer Landfill

 NIPSCO LLC R. M. Schahfer Schahfer Generating Station

Wheatfield, Indiana

Analyte	Unit		GAMW-20		GAN	IW-24	GAM	W-24B		GAMW-25		GAM	W-25B	GAM	1W-26	GAM	W-26B	GAM	1W-27	GAM	W-27B
		2019-02-26	2019-02-26	6 2019-10-09	2019-02-27	2019-10-07	2019-02-27	2019-10-07	2019-02-28	3 2019-02-28	2019-10-08	2019-02-28	2019-10-08	2019-02-28	2019-10-08	2019-02-28	8 2019-10-08	2019-02-26	2019-10-09	2019-02-27	2019-10-09
		FD	N	N	N	N	N	Ν	FD	N	Ν	N	N	N	N	N	Ν	N	N	N	N
CCR Appendix III																					
Boron	mg/L	2.9	2.8	3.8	0.055 J	0.057 J	0.056 J	0.059 J	0.16	0.16	0.23	0.14	0.14	0.26	0.23	0.36	0.36	5.7	4.5	11	11
Calcium	mg/L	140	140	200	83	76	55	52	69	70	68	83	73	87	65	75	120	260	170	90	230
Chloride	mg/L	15	14	13	19	15	5.3	5.1	2.4	2.3	2.4	7.1	5.7	1.3	2.2	17	33	29	17	440	390
Fluoride	mg/L	0.21	0.2	0.24	0.12	0.12	0.11	0.13	1.1	1.1	1.5	0.19	0.23 J+	2.3	3.2	0.18	0.21 J+	0.32	0.45	0.13 J	0.17 J
рН	SU		3.69	7.48	7.37	7.34	7.62	7.81		6.84	7.26	7.06	6.99	7.14	7.54	7.3	7.38	7.15	7.51	7.52	7.65
Sulfate	mg/L	470	470	670	80	69	46	44	63	64	65	66	84	81	85	200	410	730	450	7000	6000
Total Dissolved Solids	mg/L	1100	1100	1200	370	320	250	230	320 J+	330 J+	350 J+	360 J+	340 J+	420 J+	350 J+	590 J+	42 J+	1400	920	13000	8500
Sample Parameters																					
Dissolved Oxygen	mg/L		0.59	0.10	0.2	0.38	0.38	0.14		5.6	3.13	0.23	0.46	1.02	0.65	1.9	2.04	0.57	0.42	0.47	0.29
Oxidation-Reduction Potential	millivolts		-34.6	47.1	-12.9	67.7	-25.8	-91.9		-11.4	89.1	-29.5	77.6	-17.5	58.6	-15.6	26	-55.1	39.3	-124.8	70.2
рН	SU		7.1	7.49	7.37	7.34	7.62	7.81		6.84	7.26	7.06	6.99	7.14	7.54	7.3	7.38	7.15	7.51	7.52	7.65
Specific Conductivity	uS/cm		1096	1314	384	407	282	253		306	421	407	377	422	409	644	840	1164	951	10019	8988
Temperature	deg c		9.57	17.4	7.56	16.2	10.1	13.3		5.82	16.9	9.35	13.1	7.64	17.5	9.99	13.4	9.7	17.5	12.3	14.9
Turbidity	ntu		3.69	7.48	4.66	4.12	4.97	3.69		2.12	2.9	2.47	1.69	1.89	1.6	4.86	4.35	1.8	1.08	2.19	4

Notes:

mg/L = milligrams per liter uS/cm = micro Siemens per centimeter

deg C = degrees Celsius

NTU = Nephelometric Turbidity Units

SU = Standard Units

"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 is estimated.

"J+" = Indicates the result is estimated may be biased high.

 Table 3: Analytical Data

 CCR Unit R. M. Schahfer Landfill

 NIPSCO LLC R. M. Schahfer Schahfer Generation

Wheatfield, Indiana

Analyte	Unit	GAN	IW-38		GAMW-38B	}	GAN	/W-39	GAM	V-39B		GAMW-40		GAM	N-40B	GAN	/W41	GAMV	V41B
		2019-02-27	2019-10-10	2019-02-27	2019-10-10	2019-10-10	2019-02-27	2019-12-05	2019-02-28	2019-12-05	2019-02-28	2019-10-10	2019-10-10	2019-02-28	2019-10-10	2019-02-28	2019-10-10	2019-03-01	2019-10-10
		Ν	N	N	FD	Ν	N	Ν	N	N	N	FD	Ν	N	N	Ν	N	N	N
CCR Appendix III																			
Boron	mg/L	0.82	1.1	7.3	6.4	6.5	1.2	1.3	16	15	3.2	3	2.9	32	31	17	11	33	27
Calcium	mg/L	79	100	240	230	230	170	180	360	400	250	280	270	210	220	350	260	310	98
Chloride	mg/L	6.1	6.2	40	33	33	13	11	76	62	14	15	15	770	790	480	360	890	760
Fluoride	mg/L	0.15	0.23	0.088	0.11	0.13	0.25	0.22	0.075	0.078 J	0.089	0.13	0.13	0.82	0.96	0.39	0.45	0.8	0.93
рН	SU	7.33	7.18	7.06		6.93	6.86	6.18	6.91	5.32	6.7		6.52	7.91	7.68	6.91	6.94	7.73	7.81
Sulfate	mg/L	200	350	910	780	760	250	240	1500	1500	370	330	330	6500	6400	4800	3300	7800	7000
Total Dissolved Solids	mg/L	540	790	1800	1600	1700	880	890	2700	2300	1400	1600 J	3000 J	8900	11000	7100	6100	12000	4000
Sample Parameters																			
Dissolved Oxygen	mg/L	1.15	0.33	0.13		0.17	0.5	0.08	0.1	0.6	0.11		0.3	0.46	0.2	0.04	0.19	0.02	0.18
Oxidation-Reduction Potential	millivolts	-105.1	-73.1	-81.3		-61.5	-40	29.7	-67.5	26.1	-36.1		-8.9	-154.1	-137.3	-50.2	-57.1	-181.4	-139.4
рН	SU	7.33	7.18	7.06		6.93	6.86	6.18	6.91	5.32	6.7		6.52	7.91	7.68	6.91	6.94	7.73	7.81
Specific Conductivity	uS/cm	551	769	1632		1317	870	864	2525	2223	1389		1503	9971	9761	6783	6018	11912	11044
Temperature	deg c	8.08	16	10.4		13.8	9.12	13.1	11.53	13.3	9.6		17.6	12.3	15.7	10.47	19.1	15.24	17.3
Turbidity	ntu	2.67	1.71	3.47		4.16	4.57	4.1	2.69	3.95	1.88		1.49	0.8	1.92	1.98	2.05	3.93	2.51

Notes:

mg/L = milligrams per liter

uS/cm = micro Siemens per centimeter

deg C = degrees Celsius

NTU = Nephelometric Turbidity Units

SU = Standard Units

"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 is estimated.

"J+" = Indicates the result is estimated may be biased high.

Prepared by: AMH Checked by: DFS Reviewed by: MAH

Figures







1 II IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MO

APPENDIX A

RMSGS Landfill Phases V and VI Alternative Source Demonstration March 2019

Northern Indiana Public Service Company R. M. Schahfer Generating Station Wheatfield, Indiana

Schahfer Landfill Phase V and Phase VI

Certification of Alternative Source Demonstration

40 CFR §257.94{e)(2) & Corresponding Regulations under 329 Indiana Administrative Code 10-9-1

I, Daniel Sullivan, being a Professional Engineer in accordance with the laws of the State of Indiana, and having experience in the design, construction, and operation of restricted waste landfills and groundwater monitoring systems for them, do hereby state that I am qualified in the subject matter of CCR management, groundwater monitoring, data interpretation, and groundwater impacts. I have personally examined and am familiar with this alternative source demonstration (ASD), the subject of which is non-CCR regulated landfill cells located at the NIPSCO R. M. Schahfer Generating Station, prepared by Golder, and dated March 2019. Based on an inquiry of those individuals immediately responsible, and on supporting data which I understand to be true, accurate and complete, I verify the information in this ASD is accurate and meets the applicable requirements of the CCR Final Rule. In consideration of the above, I certify to the best of my knowledge, information, and belief, that the ASD for the regulated CCR management unit referred to as Phase V and Phase VI has been prepared and meets the applicable requirements of 40 CFR §257.94(e)(2) and corresponding State of Indiana requirements.

Daniel Sullivan Indiana Professional Engineer License # 19600309



3-21-19

Date



TECHNICAL MEMORANDUM

DATE March 21, 2019

Project No. 164817101

EMAIL dsylvia@golder.com

- TO Marc Okin, Dan Sullivan, NiSourceNiSource
- CC Sasha Reyes, Maureen Turman, Craig Myers, Joe Kutch, Mark Haney, Jim Peace
- **FROM** Danielle Sylvia

RE: R.M. SCHAHFER LANDFILL PHASE V AND VI ALTERNATIVE SOURCE DEMONSTRATION

On behalf of Northern Indiana Public Service Company (NIPSCO), Golder Associates Inc. (Golder) performed a statistical evaluation of groundwater analytical results from the third (September 2018) groundwater Detection Monitoring event at the Rollin M. Schahfer Generating Station (RMSGS) Landfill Phase V and Phase VI (CCR Unit) in accordance with 40 Code of Federal Regulations (CFR) Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule" (CCR Final Rule), as amended, and corresponding regulations under 329 Indiana Administrative Code (IAC) 10-9-1.

The statistical analyses of Appendix III groundwater Detection Monitoring results indicated statistically significant increases (SSIs) for seven analytes in downgradient wells compared to background levels. Although determination of an SSI generally indicates that the groundwater monitoring program should transition from Detection Monitoring to Assessment Monitoring, 40 CFR §257.94(e)(2) allows the owner or operator (i.e., NIPSCO) to demonstrate that a source other than the CCR unit or another condition caused the apparent SSI(s). Golder identified similar SSIs after the first (October 2017) Detection Monitoring event at the RMSGS Landfill Phase V and Phase VI and submitted an Alternative Source Demonstration (ASD) on April 13, 2018. As described in the ASD, the conceptual site model, historical groundwater data, and landfill design indicate that the source of the identified SSIs is the non-regulated, unlined portion of the landfill, Phases I and II. Golder recertified the ASD based on the second (February/March 2018) Detection Monitoring Event, on August 28, 2018.

NIPSCO began construction of a new landfill cell (Phase VII) immediately north of Phase VI in 2018. Due to the proximity of Phase VII to Phase VI, Golder decommissioned monitoring wells GAMW-21/21B, GAMW-22/22B, GAMW-23/23B, and GAMW-28/28B, which were part of the original landfill monitoring network. Golder collected groundwater samples from these four well pairs from July 2016 to March 2018. To replace the decommissioned wells, Golder installed monitoring wells GAMW-38/38B, GAMW-39/39B, GAMW-40/40B, and GAMW-41/41B downgradient and along the waste boundary of Phase VII in April and May 2018.

Golder collected groundwater samples from the existing and newly-installed monitoring wells during the September 2018 semi-annual monitoring event with the exception of GAMW-41/41B, which were inaccessible due to landfill construction activities. Groundwater analytical data obtained from groundwater samples collected from the downgradient wells in September 2018 were consistent with historical analytical results, therefore, collection of groundwater samples from GAMW-41/41B were not considered necessary at this time and no further action was taken. Golder plans to collect groundwater samples from GAMW-41/41B during the next semi-annual groundwater monitoring event scheduled for February/March 2019.

1.0 SUMMARY OF RESULTS

The results of the third Detection Monitoring event were included in the 2018 Annual Report and the results of the statistical analysis are summarized below. SSIs were detected in groundwater samples collected from monitoring wells downgradient of the RMSGS Landfill Phase V and Phase VI, for all Appendix III parameters. Overall, results are consistent with those collected previously and indicate few differences from the SSIs detected during the first and second Detection Monitoring events. The differences are likely due to normal or temporal fluctuations in groundwater quality. The third Detection Monitoring event SSI results are summarized by well number and compared to the results from the previous sample rounds in the table below.

Monitoring Well ID	Boron	Calcium	Chloride	Fluoride	Sulfate	рН	TDS
GAMW21*							
GAMW21B*	1,2	1,2	1		1,2		1,2
GAMW22*		2					
GAMW22B*	1,2	1,2	1,2		1,2		1,2
GAMW23*	1,2	1,2			1,2	1,2	1,2
GAMW23B*	1,2	1,2	1,2		1,2	1,2	1,2
GAMW26				1,3			2
GAMW26B		1,3	3		1,3	3	1,3
GAMW27	1,2,3	1,2,3			1,2,3		1,2,3
GAMW27B	1,2,3	1,2,3	1,2,3		1,2,3	3	1,2,3
GAMW28*	1,2	1,2	1		1,2		1,2
GAMW28B*	1,2	1,2	1,2		1,2		1,2
GAMW38							
GAMW38B	3	3	3		3		3
GAMW39	3	3			3		3
GAMW39B	3	3	3		3		3
GAMW40	3	3			3		3
GAMW40B	3	3	3		3	3	3

"1" Indicates a statistically significant increase detected in the first Detection Monitoring event

"2" Indicates a statistically significant increase detected in the second Detection Monitoring event

"3" Indicates a statistically significant increase detected in the third Detection Monitoring event

"*" Indicates monitoring well was decommissioned prior to the third Detection Monitoring event

2.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSION

The preceding information indicates the results of the third Detection Monitoring event were similar to those from the first and second Detection Monitoring events, and the ASD dated April 13, 2018 is still applicable. Golder prepared the ASD in accordance with 40 CFR 257.94(e)(2) and supports the finding that the SSIs determined on December 23, 2018 are not due to release from the CCR Unit. As described in the ASD, the conceptual site model, historical groundwater data, and landfill design indicate that a release from the non-regulated, unlined portion of the landfill, Phases I and II, is the source of the identified SSIs. Therefore, no further action (i.e., Assessment Monitoring) is warranted, and the Schahfer Landfill Phases V and VI will remain in Detection Monitoring.

3.0 REFERENCES

Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", August 28, 2018.

Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", April 13, 2018.

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APPENDIX B

RMSGS Landfill Phases V and VI Alternative Source Demonstration September 2019

Northern Indiana Public Service Company R. M. Schahfer Generating Station Wheatfield, Indiana

Schahfer Landfill Phase V and Phase VI

Certification of Alternative Source Demonstration

40 CFR §257.94{e)(2) & Corresponding Regulations under 329 Indiana Administrative Code 10-9-1

I, Daniel Sullivan, being a Professional Engineer in accordance with the laws of the State of Indiana, and having experience in the design, construction, and operation of restricted waste landfills and groundwater monitoring systems for them, do hereby state that I am qualified in the subject matter of CCR management, groundwater monitoring, data interpretation, and groundwater impacts. I have personally examined and am familiar with this alternative source demonstration (ASD), the subject of which is non-CCR regulated landfill cells located at the NIPSCO R. M. Schahfer Generating Station, prepared by Golder, and dated September 2019. Based on an inquiry of those individuals immediately responsible, and on supporting data which I understand to be true, accurate and complete, I verify the information in this ASD is accurate and meets the applicable requirements of the CCR Final Rule. In consideration of the above, I certify to the best of my knowledge, information, and belief, that the ASD for the regulated CCR management unit referred to as Phase V and Phase VI has been prepared and meets the applicable requirements of 40 CFR §257.94(e)(2) and corresponding State of Indiana requirements.

Daniel Sullivan Indiana Professional Engineer License # 19600309





TECHNICAL MEMORANDUM

DATE September 6, 2019

Project No. 19126075

EMAIL dsylvia@golder.com

- TO Marc Okin, Dan Sullivan NIPSCO
- CC Sasha Reyes, Maureen Turman, Craig Myers, Joe Kutch, Mark Haney, Jim Peace
- **FROM** Danielle Sylvia

RE: R.M. SCHAHFER LANDFILL PHASES V AND VI ALTERNATIVE SOURCE DEMONSTRATION

On behalf of Northern Indiana Public Service Company (NIPSCO), Golder Associates Inc. (Golder) performed a statistical evaluation of groundwater analytical results from the fourth (March 2019) groundwater Detection Monitoring event at the Rollin M. Schahfer Generating Station (RMSGS) Landfill Phase V and Phase VI (CCR Unit) in accordance with 40 Code of Federal Regulations (CFR) Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule" (CCR Final Rule), as amended, and corresponding regulations under 329 Indiana Administrative Code (IAC) 10-9-1.

Statistical analyses of Appendix III groundwater Detection Monitoring results indicated statistically significant increases (SSIs) for six analytes detected in groundwater samples collected from downgradient wells compared to background levels. Although determination of an SSI generally indicates that the groundwater monitoring program should transition from Detection Monitoring to Assessment Monitoring, 40 CFR §257.94(e)(2) allows the owner or operator (i.e., NIPSCO) to demonstrate that a source other than the CCR unit or another condition caused the apparent SSI(s). Golder identified similar SSIs after the first (October 2017) Detection Monitoring event at the RMSGS Landfill Phase V and Phase VI and submitted an Alternative Source Demonstration (ASD) on April 13, 2018. As described in that ASD, the conceptual site model, historical groundwater data, and landfill design indicate the source of the identified SSIs is the unlined portion of the landfill, Phases I and II, which is not regulated by the CCR Final Rule. Golder recertified the ASD based on the second (February/March 2018) Detection Monitoring Event, on August 28, 2018 and the third (September 2018) Detection Monitoring Event, on March 21, 2019.

NIPSCO began construction of a new landfill cell (Phase VII) immediately north of Phase VI in 2018. Due to the proximity of Phase VII to Phase VI and landfill construction activities, Golder decommissioned monitoring wells GAMW-21/21B, GAMW-22/22B, GAMW-23/23B, and GAMW-28/28B, which were part of the original CCR Rule-required landfill monitoring network. Golder collected groundwater samples from these four well pairs from July 2016 to March 2018. To replace the decommissioned wells, Golder installed monitoring wells GAMW-38/38B, GAMW-39/39B, GAMW-40/40B, and GAMW-41/41B downgradient and along the waste boundary of Phase VII in April and May 2018.

Golder collected groundwater samples from the existing and newly-installed monitoring wells during the March 2019 semi-annual monitoring event. Groundwater analytical data obtained from groundwater samples collected from the downgradient wells in March 2019 were consistent with historical analytical results. Golder reviewed the analytical data collected to date and considered the option to update the prediction limits. The Groundwater Monitoring Program Implementation Manual (GMPIM, 2017) and the Unified Guidance allow for updating

statistical limits after a minimum of four "new measurements" are available. The periodic update of background datasets improves statistical power and accuracy by providing a more complete approximation of the true background population. Based on the relatively short period of time (i.e., less than 16 months) in which the background samples were collected, it is likely that the changes being observed in data population are due to natural variability. The analytical data collected, and groundwater flow directions observed to date, indicate that the chosen background wells are still representative of background conditions. Consequently, Golder calculated new prediction limits in June 2019 using all background data collected to date. The table below provides the original prediction limits calculated in January 2018 and the revised prediction limits calculated in June 2019. Golder will re-evaluate the background dataset following collection of an additional four rounds of groundwater data from the background wells.

1.0 SUMMARY OF RESULTS

The results of the fourth Detection Monitoring event are included in the 2019 Annual Report and the results of the statistical analysis are summarized below. SSIs were detected in groundwater samples collected from monitoring wells downgradient of the RMSGS Landfill Phase V and Phase VI, for all Appendix III parameters. Overall, results are consistent with those collected previously and indicate few differences from the SSIs detected during the previous Detection Monitoring events. The differences are likely due to normal or temporal fluctuations in groundwater quality. The SSI results are summarized in the table below by well location and timeframe of the SSI exceedance.

Monitoring Well ID	Boron	Calcium	Chloride	Fluoride	Sulfate	рН	TDS
Prediction Level (January 2018)	1.7	116.1	34.91	2.3	300	6.465-7.739	653.4
Prediction Level (June 2019)	3.2	130.9	39.93	2.3	470	6.353-7.82	1100
GAMW21*							
GAMW21B*	1,2	1,2	1		1,2		1,2
GAMW22*		2					
GAMW22B*	1,2	1,2	1,2		1,2		1,2
GAMW23*	1,2	1,2			1,2	1,2	1,2
GAMW23B*	1,2	1,2	1,2		1,2	1,2	1,2
GAMW26				1,3			2
GAMW26B		1,3	3		1,3	3	1,3
GAMW27	1,2,3,4	1,2,3,4			1,2,3,4		1,2,3,4
GAMW27B	1,2,3,4	1,2,3	1,2,3,4		1,2,3,4	3	1,2,3,4

Monitoring Well ID	Boron	Calcium	Chloride	Fluoride	Sulfate	рН	TDS
Prediction Level (January 2018)	1.7	116.1	34.91	2.3	300	6.465-7.739	653.4
Prediction Level (June 2019)	3.2	130.9	39.93	2.3	470	6.353-7.82	1100
GAMW28*	1,2	1,2	1		1,2		1,2
GAMW28B*	1,2	1,2	1,2		1,2		1,2
GAMW38							
GAMW38B	3,4	3,4	3,4		3,4		3,4
GAMW39	3	3,4			3		3
GAMW39B	3,4	3,4	3,4		3,4		3,4
GAMW40	3,4	3,4			3		3,4
GAMW40B	3,4	3,4	3,4		3,4	3,4	3,4
GAMW41	4	4	4		4		4
GAMW41B	4	4	4		4		4

"1" Indicates a statistically significant increase detected in the first Detection Monitoring event

"2" Indicates a statistically significant increase detected in the second Detection Monitoring event

"3" Indicates a statistically significant increase detected in the third Detection Monitoring event

"4" Indicates a statistically significant increase detected in the fourth Detection Monitoring event

"*" Indicates monitoring well was decommissioned prior to the third Detection Monitoring event

2.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSION

The preceding information indicates the results of the fourth Detection Monitoring event are consistent with the previous Detection Monitoring events, and the rationale behind the ASD dated April 13, 2018 is still applicable. Golder prepared the ASD in accordance with 40 CFR 257.94(e)(2) and it supports the finding that the SSIs determined on June 8, 2019 are not due to a release from the CCR Unit. As described in that ASD, the conceptual site model, historical groundwater data, and landfill design indicate that a release from the unlined portion of the landfill not subject to the CCR Final Rule, Phases I and II, is the source of the identified SSIs. Therefore, no further action (i.e., Assessment Monitoring) is warranted, and the Schahfer Landfill Phases V and VI will remain in Detection Monitoring.

3.0 REFERENCES

Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", March 31, 2019.

Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", August 28, 2018.

Golder Associates, "Northern Indiana Public Service Company R.M. Schahfer Generating Station Wheatfield, Indiana- Schahfer Landfill Phase V and Phase VI - Alternative Source Demonstration", April 13, 2018.

https://golderassociates.sharepoint.com/sites/nipscoccrgwmonitoring/shared documents/r.m. schahfer generating station/reports/landfill asd recertification september 2019/final/landfill asd recertification 090619.docx



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